

CREATION AND EVOLUTION OF NORTH AMERICA'S GAS & ELECTRICITY
REGIME: A DYNAMIC EXAMPLE OF INTERDEPENDENCE

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ABSTRACT

Growing interdependence of Canada, the United States, and Mexico in production, trade, and consumption of natural gas and electricity during the 1990s produced a new North American functional entity -- partly governmental, partly non-governmental, and partly intergovernmental. Cooperation among three dissimilar, jealously sovereign countries has surmounted several shocks (California's flawed energy "deregulation" experiments, Enron's scandal, disagreements over the Kyoto Protocol and the Iraq invasion, soaring energy prices, and economic downturns).

Explaining this as an international regime (a system of principles, norms, rules, and decision-making procedures around which actor expectations converge in a given issue area), this work explains the timing of its emergence . . . and how its self-adjusting nature portends increasing significance. Extensive interviews are augmented by newly obtained U.S. government documents about U.S.-Mexican gas negotiations in the late 1970s -- when a regime seemed logical, but when necessary and sufficient conditions were lacking.

The North American Free Trade Agreement had to be accompanied by regulatory reforms and some market effects, while the gas and electricity industries converged and electronic developments facilitated exchanges of current and future supplies of gas and/or electricity. Now, mutually beneficial pipeline and powerline connections spur expansion, while backsliding from regime acceptance becomes ever more costly -- especially for some regions.

This is a "virtual" regime -- sensed by those involved with no formal charter beyond NAFTA's vague treatment of energy. It is "metanational" -- grounded both

within and beyond these nation-states. Operating in accord with varied modes of governance, but also through such modest institutions as the North American Energy Working Group and the North American Commission for Environmental Cooperation, the regime supports differing national energy policy goals for the three countries and adjusts to their changing perceptions of how desirable objectives (supply adequacy, affordability, reliability, and environmental acceptability) should be interpreted and balanced. Defection becomes politically unacceptable for fear of damaging national interests.

Relative power is a motivating force, but domestically in each federal state as well as internationally. Earlier analyses of U.S. decisionmaking in foreign affairs are adapted to energy policy for multi-branch structures influenced by both private sectors and geopolitics.

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CONTENTS

ABSTRACT ii

CHAPTER

I. OVERVIEW – FOCUSING ON THE PRACTICAL	1
II. OTHER USES OF THE TERM “ENERGY INTERDEPENDENCE”	26
Multiple Applications Are Inevitable	26
Global Oil Relationships	28
Particularizing, Narrowing, and Refining a Definition	33
Power and Interest – Contrasting Oil with Gas & Electricity	34
III. THE EVOLVING NORTH AMERICAN ENERGY MARKET	39
Background and Current Situation	39
Energy Mix in the Three Countries	43
The Special Roles of Gas and Electricity	61
Degrees of Interdependence	65
Status of Trans-Border Links for Gas and Electricity	73
Some Technical Considerations	89
The Neglected Factor – Time	94
IV. WHAT MAKES UP THE GAS & ELECTRICITY REGIME?	101
A Matter of Definition and Comparison	101
Fitting an Abstract Model	103
Variety and Harmony in National Energy Regulation	110
What Changed in 2000?	116

The Role of the North American Energy Working Group	121
Subnational Governments, NGOs, and the Effects of Federalism	128
Elements of the Regime Beyond North America	138
Satisfying the Definition	143
V. NECESSARY AND SUFFICIENT FACTORS FOR ENERGY INTERDEPENDENCE	152
Reducing Barriers at the Borders: Stage One	152
Reducing Barriers at the Borders: Stage Two	162
Opening Avenues for Competition in Each Country	174
Applying Information Technology (IT) to Energy Markets	183
Gas or Electricity – Which Do You Need?	190
Savoring the Fruits of Synergism	196
VI. HOW AN EARLIER EFFORT FOUNDERED	201
The Story in Brief	201
U.S.-Mexico 1977 Gas Negotiations, Seen in a Fresh Light	212
The Players, Their Interests, and Their Relative Power	262
The Economics	273
Absence of the Regime’s “Necessary” Factors	281
VII. DOMESTIC PERCEPTIONS OF NATIONAL INTERESTS	286
Systemic Determinants of Energy Policy	286
Goals of National Energy Policy	289
Origins of National Energy Policy Decisions	294
How The United States Does It	299
Power and Process Differences among the Three Partners	307

Downsides and Dangers	312
VIII. HOW CHANGE TAKES PLACE IN THIS REGIME	316
Forces of Evolution	316
General Pathways of Influence	324
Strengthening: Institutional and Physical Infrastructure	331
Weakening: Burdens of Uncertainty and Suspicion	336
Ratcheting: Costs and Likelihood of Defecting	339
FIGURES	
1. Net Electricity Generation (by Fuel) in Canada, Mexico, and the U.S.	46
2. How Change Occurs: A Dynamic Example of Interdependence	321
TABLES	
1. Major Forms of Primary Energy Consumption (NAFTA Countries, 2000)	45
2. Percentage of Energy Consumption by Sector (NAFTA Countries, 1998E)	45
3. Significant Emission from the Electricity Generating Sector in North America (1998)	46
4. Gas & Power Regulatory Highlights – A North American Time Line	170
SELECTED BIBLIOGRAPHY AND SOURCES CONSULTED	350
CURRICULUM VITAE	370

I. OVERVIEW: FOCUSING ON THE PRACTICAL

In North America today, natural gas and electricity present an encouraging story of mutual benefits across international borders, derived from an informal complex of governmental and private cooperation. This story has been unfolding gradually but inexorably since about 1990, although not without some troublesome wrinkles during the past few years. The evolving gas-and-electricity relationship among Canada, Mexico, and the United States may have implications elsewhere around the world, and analyzing it may help to enlighten the long-debated question of how changes can take place in what specialists call “an international regime”.

There is no such thing yet as a single, seamless North American gas-and-electricity market, although the basic movement of the regime I shall describe lies in that direction. Even in the United States -- the continent’s largest and most nearly unified national actor – there are innumerable differences from state to state in energy regulation and requirements, with real-life barriers to the delivery of electricity beyond prescribed regions. The three countries have marked dissimilarities in government, in enterprise ownership, and – most important – in energy policy priorities. Thus, variations persist in price and supply. Nevertheless, a gas-and-electricity regime exists . . . and it is safe to predict that it will grow stronger.

One must concede that continental energy interdependence involves costs as well as benefits; and full realization of the energy potential of North America is contingent on balance and compromise (both of which are facilitated by the regime). We are witnessing an evolution rather than a *fait accompli*. Occasionally, there have even been unpleasant

reminders that the energy destinies of all three NAFTA countries are tied together as never before in their histories: 1) Both Canada and Mexico felt the price surges and supply shortfalls in both gas and electricity that afflicted California in 2000-2001; 2) Some of the machinations of Enron (actually, abuses of the regime) were reflected in activities by other U.S. and Canadian firms; 3) The power blackout of August 2003 affected a huge region that overlapped Canadian provinces and U.S. states in the vicinity of the Great Lakes.¹ In all three episodes, gas-and-electricity linkages permitted an initial problem to spread, yet in all three cases the existence of a regime held out solutions and/or improved prospects of avoiding such problems in the future.²

As these three countries move through the first decade of the 21st century, it is fortunate overall that they have become palpably interdependent in the two economic building blocks of gas and electricity. Gas and electricity account for three-fifths of all the primary energy they consume; and North America (as a whole) is effectively independent of outside suppliers in these two energy sources for the foreseeable future. Liquefied natural gas, arriving from abroad in refrigerated tankers, has been widely publicized recently and will make increasing contributions. Yet LNG is most likely to remain a marginal source, and it will still have to utilize the continental pipeline system that continues to spread across the northern and southern borders of the United States (to the advantage of Canada and Mexico as well).

¹ *The Final Report of the U.S.-Canada Power System Outage Task Force Final Report on the August 14 Blackout* is available on the Internet at <http://www.nerc.com/~filez/blackout.html>

² For instance, see U.S.-Canada Power System Outage Task Force, *Interim Report: Cause of the August 14th Blackout in the United States and Canada*, November 2003, especially its "Overview of the North American Electric Power System and Its Reliability Organizations", pp. 3-13. The Final Report was issued on April 5, 2004, again indicating support for an independent, self-regulatory organization to develop and enforce electric reliability standards. Chapter IV of this dissertation explains that the North American Electric Reliability Council (one element of the regime) is perfectly positioned to fill this role if U.S. legislation still pending at this time is adopted.

Oil supply is generally acknowledged to be the most critical element in the worldwide energy system. Why, then, digress from oil and focus on natural gas and electricity within the energy portfolios of three neighboring but sharply dissimilar countries? First, oil-related activities are more properly part of a global supply system than of a continental network. Second, North American cooperation in gas and electricity offers more of a realistic basis for practical accomplishment in the relatively near future.

Myths about energy die hard, however.³ It has been roughly 30 years since U.S. politicians and pop-analysts began to talk about achieving total “energy independence” for this country, and the phrase (which implicitly embraces self-sufficiency in oil as well) is still heard. In light of stubborn political, corporate, and popular resistance to compulsory efficiency improvements for motor vehicles, though, it is improbable that such a goal could be reached in the foreseeable future in respect to oil. The use of that commodity lies overwhelmingly in the transportation sector. Even assuming that we muster greater societal resolve, the turnover time for a substantial replacement of an enormous automotive fleet is usually underestimated. As a result, depending on how the cutoff was brought about, eliminating all (or even almost all) imports of crude oil and refined petroleum products to North America within less than about a generation could easily induce sub-optimal economic and/or environmental side-effects.

Except in the transportation sector, we have reduced the relative role of oil as an energy source throughout the North American energy system about as much as we

³ In an earlier era, Charles F. Doran focused on half a dozen of these in his *Myth, Oil, and Politics: Introduction to the Political Economy of Petroleum* (The Free Press, New York, 1977). That book deals with quite a different type of international regime, the Organization of Oil Exporting Countries (OPEC). When it is contrasted with the type of energy interdependence that operates within North America today, however, rich insights can appear.

practically can. We have done so in large measure by replacing it with natural gas and electricity for many applications in the residential, commercial, and industrial sectors that depended exclusively on petroleum 20 or 30 years ago. If we should fail to maintain adequate, cost-effective, and environmentally acceptable supplies of gas and electricity to all three countries, our collective “oil vulnerability” would quickly assume intolerable proportions. Thus, trilateral interdependence in gas and electricity (which is fostered by the existence of the regime that has evolved) helps to preserve overall “energy security” -- apart from other net benefits it produces.

As things stand now, complete self-sufficiency in oil is too high a hurdle to contemplate surmounting realistically, even if we consider the resources of the three countries jointly. The United States, Mexico, and Canada (in this order) all rank among the top 10 petroleum producers in the world, yet their total output satisfies only 60 percent of their combined thirst for liquid fuels. It is improbable that such a wide gap will be closed in the next 10 to 20 years -- even by exploiting ANWR (the Arctic National Wildlife Refuge) in Alaska, fully opening up Canada’s Far North and the deep waters of the Gulf of Mexico, and further developing “heavy oil” and other rich unconventional sources in Canada.

In their most expansive moments, Canadian leaders point to Alberta’s oil sands as rivaling the Persian Gulf as a supply source; and Shell Canada has suggested that heavy investment could raise production from around 1 million barrels per day to 4 mmbd as soon as 2010. But the Energy Information Administration of the U.S. Department of Energy is more gradualistic in its projections, even after accepting the conclusion by *Oil & Gas Journal* that “With today’s technologies and oil prices, it is entirely appropriate to

consider western Canada's vast oil potential as being commensurate with 'conventional' oil." EIA's *International Energy Outlook 2003* estimated Canadian production from oil sands at between 2.2 and 2.5 million barrels per day (mmbd) by 2025, depending on whether the world price of oil matches EIA's reference case criterion of U.S.\$27 by that time (\$48 per barrel in "nominal" 2025 dollars) or goes up to \$33.⁴ Less than a year later, however, its *Annual Energy Outlook 2004* projected 2025 production at 3.3 mmbd.⁵

Supply-enhancing measures for oil still ought to be pursued. We might also gain from further fuel-substitution where feasible . . . and from increased efficiency efforts on both the supply side and the demand side. But it is important not to overpromise in terms of "simple" solutions, as early supporters of nuclear power learned . . . and as hyper-enthusiasts for solar, wind, and biomass energy may come to realize in time. Each and every part of a usefully diversified national (or trinational) energy-mix is likely to be needed. Natural gas and electricity occupy a special position within the mix today because of the way they have come to be marketed, delivered, and even exchanged for one another in order to promote efficiency in all of the basic energy-consuming sectors⁶. The whole process deserves to be better understood. Thanks to the unique, issue-specific regime in which interdependence has developed and seems destined to flourish, basic energy interests of all three countries are being served.

⁴ Energy Information Administration, U.S. Department of Energy, *International Energy Outlook, 2003* (published May, 2003), p. 40. EIA's publications are available on the Internet at www.eia.doe.gov. Hereafter, this publication will be cited as *IEO 2003*; and all prices will be in U.S. dollars.

⁵ Energy Information Administration, U.S. Department of Energy, *Annual Energy Outlook, 2004* (published January, 2004), p. 44. Hereafter, this publication will be cited as *AEO 2004*.

⁶ The most common breakdown in energy use and demand is among: 1) residential, 2) commercial, 3) industrial, and 4) transportation. Electricity is a bridge between primary energy supply and end-use. It touches all four of these consumption sectors.

Interdependence in gas and electricity, as characterized in the chapters that follow, implies more than the creation of a free-trade area in these two energy forms. In a remarkably short time – essentially the 1990s – the three nations and their peoples have come to rely on a newly significant, self-sustaining, and growing network of pipelines and power-lines that crisscross borders and can serve to unite societies in ways that more generalized commerce might not. It is no exaggeration to label energy the lifeblood of any economy. Thus, what we can see emerging is a common circulatory system for North America. In some areas, common interests have engendered joint, reciprocal, or parallel actions that can produce simultaneous improvement for almost everyone concerned. Seasonal trade is a quick and simple example; the focusing of technological research and development programs involves slower and less obvious “payoffs”.

Energy trade among the three nations of North America is hardly new⁷, but energy interdependence is. The latter term is defined here as “a situation in which events affecting significantly the energy supply or demand in one country are reflected inevitably and promptly across the borders, in both directions and in both energy and non-energy areas”. It implies two-way relationships that are quickly and inevitably responsive, not only to gross supply and demand within the respective countries for at least these two key sources (gas and electricity) but also to some non-energy factors that underlie them. Those factors include such variables as local and regional weather, environmental and economic regulation at any level, national fiscal and monetary policy,

⁷See Jonathan P. Stern, *Natural Gas Trade in North America and Asia*, Policy Studies Institute and Royal Institute of International Affairs, Gower Publishing Company, Ltd., Brookfield, VT (1985), and U.S. Department of Energy, EIA, *U.S. Electricity Trade with Canada and Mexico*, Washington, (January 1992).

technological opportunities, and shifts in socio-political attitudes. To a large extent, intervening variables become systemic.

The regime that grew up alongside North American energy interdependence and continues to nurture it is a new, overarching system of facilitative cooperation. It satisfies the criteria found in the seminal work on international regimes, a collection of essays edited by Stephen D. Krasner a couple of decades ago. That author's overview stated the classic definition:

Regimes can be defined as sets of implicit or explicit principles, norms, rules, and decision-making procedures around which actors' expectations converge in a given area of international relations. Principles are beliefs of fact, causation, and rectitude. Norms are standards of behavior, defined in terms of rights and obligations. Rules are specific prescriptions or proscriptions for action. Decision-making procedures are prevailing practices for making and implementing collective choice.⁸

Energy interdependence interacts with domestic political structures in each country, besides influencing nation-to-nation liaison within the global system. Even the possibility of this particular continental regime would have been doubted as recently as a quarter-century ago; and – because it is still a work-in-progress – some observers might be skeptical that it can survive. Recently, it was tested severely by energy-price volatility, the collapse of a faultily managed plan for energy industry reorganization in California, and the implosion of Enron – a corporation that, despite its obvious faults, deserves credit for pioneering the fundamentally sound marketing system on which gas and electricity trading continues to be based. But the robustness of the regime lies in its flexibility, which in turn is based on self-interest.

⁸ Krasner, Stephen D., "Structural causes and regime consequences: regimes as intervening variables," in Krasner, Stephen D. (ed.), *International Regimes*, Cornell University Press, 1983, p. 2. Subsequent citations from this volume will simply designate it as "Krasner".

Each of the three countries has its own distinct and distinctive “national energy policy”, based on domestic circumstances and domestic perceptions of generic goals that will be explored in Chapter VII. Efforts to homogenize these into a single “continental energy policy” are as unnecessary as they are unlikely to succeed in the near future. The regime should not be viewed as a supranational entity; and it would be equally misleading to consider it as an international agreement in the classic sense (although treaty commitments form part of its structure). It is, rather, a “meta-national” arrangement – with the Greek prefix “meta” supplying the connotation “beyond; transcending; more comprehensive”.⁹ As Chapter IV explains, substantial elements of the regime are non-governmental; and these components deserve strengthening if the regime’s efficiency and effectiveness are to be optimized.

A recent book by Scott Barrett¹⁰ proposes a common-sense strategy for environmental treaty-making that proceeds from the assumption that sovereign states usually care only about their own interests and offers a method of making such treaties self-enforcing. If treaties are individually rational, collectively rational, and fair, they can create incentives for states to participate in them and for the contracting parties to comply with their rules. I apply the same reasoning to this issue-specific regime. Interdependence in gas and electricity within a multi-level, public-private regime (which includes a certain amount of institutionalized consultation, joint planning, and harmonization of “ground rules” where achievable) suits the interests of all three North American trading partners.

⁹ This specific phrasing of the definition for “meta” is taken from *The American Heritage Dictionary*, Houghton Mifflin Company, Boston, 1985. The term “meta-national” was originated by this author.

¹⁰ Scott Barrett, *Environment & Statecraft: The Strategy of Environmental Treaty-Making*, Oxford University Press, 2003.

Barriers to energy interdependence for the North American triad have changed over time. During the 1970s, naked nationalism bulwarked the resistance; and this remained the primary obstacle for the rest of the 20th century. More recently, an additional and perhaps equally serious threat has been the lure of a return to a command-and-control approach for energy regulation – most pronounced in the United States because of problems centered in California, but evident also through reactions by industry and government in Mexico . . . and lurking just below the surface of public policy discussion in Canada.¹¹

The new paradigm resulted from four factors – each a necessary condition for the evolution of “energy interdependence” as I have defined it. I contend further that all four factors (taken together) represent sufficient conditions for this relationship of mutual dependence to persist and deepen, despite political reservations based on nationalistic instincts and traditions (and in spite of the more recent concerns about intermittent price surges for gas and electricity, apprehensions about energy shortage or supply interruptions, and mistrust among disparate players of both private-sector and government motivations).

The North American regime for gas and electricity derives its strength from feedback mechanisms that make it dynamic. In Barrett’s treaty-making context (to which I have referred as an analog), he assumed that the primary players in games with international actors are the countries themselves¹². The value of Barrett’s study is that he creates a model with stripped-down assumptions from which conclusions can be drawn as

¹¹ Occasional revivals of a “Canada First” movement in respect to energy are periodically troubling, but probably do not pose a major danger.

¹² Barrett, *op. cit.*, p. 53.

its complexity is increased. This study differs in that it accepts from the outset the full complexity of the actors and of the North American energy economy. Besides analyzing the components of the regime, I suggest that we can plumb its essence by also dissecting “national energy policy”. That demands that we at least characterize goals, consider ways of achieving them, and identify the manner in which elements of the regime have an opportunity to interact and thus produce adaptive change.

Unfortunately, a system that is almost constantly in motion defies efforts to depict it in a snapshot. For that reason alone, even aside from the obvious restrictions of space and time, this work focuses mainly on the status during the 1990s of the necessary formative factors mentioned below – contrasting the situation then with a somewhat earlier period (the late 1970s), when trans-border energy trade faltered on the continent. Even these reduced targets are complex, but at least they are fixed in history. References to the especially turbulent period that began early in the year 2000 are limited to selective updates and commentaries that may suggest the potential applicability of these hypotheses to future research.

It dawned on me long ago that the patterns of ownership for energy resources and the means of distributing them in the three countries need not be identical for a true regime to appear, so long as the “rules of the game” (which is what the regime provides) fall within very broad parameters and arbitrariness is minimized. The rules will continue to change. The only alternative to such flexibility would be a rigidity based on old-fashioned power relationships among states; but none of these specific partners would tolerate such an anachronism.

The gas-and-electricity regime is more subject to shock than I once envisioned it, yet the challenges it has already survived display its resiliency. Research and the passage of time have convinced me that even the demonstrable gains accruing to each country (and, importantly, to politically potent segments of each) may be less decisive in sustaining energy interdependence than recognition of those net benefits. In the development and application of energy policies, perceptions are paramount.

Change may be directed by external events. Chapter VIII outlines how the North American energy regime that came into being during the 1990s serves as an intervening system-factor between the global energy framework and energy policies within each of the three countries. Continuity and adaptive change are both facilitated by interaction among: a) basic causal variables (such as the facilitation of price competition in energy markets); b) the complex North American regime itself (including inputs from non-governmental actors as well as relations among governmental players at various levels and in numerous specialties); and c) the related behaviors and outcomes within each of the participating countries.

Could such a situation be emulated in other parts of the world? Will it be – for instance, in Europe? Chapter VI (which explores an earlier opportunity for the development of gas-and-electricity interdependence in North America) touches on this question; but a definitive demonstration of general applicability exceeds the practical limits of a single doctoral dissertation. This work is content with trying to lay clear and solid groundwork for such follow-on study.

In North America, the four factors I deem necessary for energy interdependence to have appeared and for the gas-and-electricity regime to have become well established are these:

- 1) Institution of the Canada-U.S. Free Trade Agreement (CUSFTA) and the North American Free Trade Agreement (NAFTA);
- 2) Moves within each country toward competitive market pricing of energy commodities and “unbundling” of energy-service functions;
- 3) Introduction of electronic communication systems that link potential buyers and sellers instantaneously¹³; and
- 4) Such penetrating technologies as the combined-cycle combustion turbine (CCCT) and the potentially economical fuel cell – which foster new relationships between natural gas and electricity while encouraging distributed generation and “Btu marketing”.

Although these causal factors are both necessary and sufficient, they are not deterministic – since the regime itself responds to a certain extent to fluctuating policy interests in three different nation-states. Yet outright withdrawal from the regime is an option that remains only barely conceivable and becomes ever more remote. Although each of the four factors is in itself conceptually reversible¹⁴, their combination has

¹³Cf Keohane, Robert O., and Nye, Joseph S., *Power and Interdependence*, (3rd ed.), Longman, New York, 2001, p. xvi. In their preface to this latest edition of their classic work, the authors explain that in their very first edition (published in 1977) they sought “to understand how world politics was being affected by technological change” – initially “by the telephone, television, and jet aircraft”. In the 2001 edition they “still seek to understand this interplay between technological change and politics, although now it is the ‘information revolution’ and the Internet that exemplify the most fundamental transformations in technology.”

¹⁴ As mentioned previously, the most serious threat to date has resulted from a flyup in natural gas prices -- which was one trigger for the California electricity crisis of 2000-2001, and which encouraged some opponents of free-market pricing to seek a return to rigid government controls. Some other factors --such as

induced a fifth factor in the form of a “ratcheting effect” which – for all practical purposes – permits further movement in only one direction, i.e., toward greater interdependence. This resultant factor consists of the rapid and continuing construction of pipelines and electric power ties that connect the three countries physically in a way that ordinary trade (even intraindustry trade, epitomized by the *maquiladora* system¹⁵) does not.¹⁶ The huge overall disparity in national economic and military power between the United States and its two NAFTA partners becomes less obvious and less troubling, because these physical interconnections are sources of some essential ingredients of modern life that one prefers to take for granted once they are present. My own judgment is that we have reached a stage where this mutually beneficial infrastructure could be disrupted only with appreciable damage to all parties concerned . . . and especially in the border regions whose influence (exercised increasingly through non-governmental organizations as well as within the respective existing political systems) has grown in each country for a variety of reasons.

Trade among the three countries in petroleum and its refined products is clearly also important; but an energy interrelationship based exclusively on that could not have produced the same sort of hardy regime. Even though all three nations produce

President Vicente Fox’s difficulties in pursuing the reform of Pemex (*Petróleos Mexicanos*, the state hydrocarbon monopoly) and CFE (*Comisión Federal de Electricidad*, the state body controlling most electricity functions in Mexico) and the general economic downturn globally during 2001 that limited the availability of investment capital -- might slow the forward movement of continental energy interdependence but in no way portend an actual reversal of the trend.

¹⁵ Under this system, components exported from the United States to Mexico for assembly -- usually at lower labor and processing cost -- have been allowed to return as final products under tariff obligations equivalent only to “value added”. With a move toward the abolition of all tariffs under NAFTA, the benefit of the specific *maquiladora* arrangement is less pronounced.

¹⁶ One might make a case that a similar relationship exists across the northern border in respect to automotive vehicles and parts. This view is supported by concerns about delivery interruptions and delays produced by security measures immediately following the terrorist attack on the World Trade Center in New York on September 11, 2001 (“9/11”). Yet even the ties resulting from the historic “Auto Pact” may not affect as many people in as many ways as gas and electricity links.

significant amounts of crude oil, the underlying price of this commodity within North America depends primarily on supply and demand in the world market – while the interesting market parameters of electricity and natural gas (supply, demand, and price) are all determined more fundamentally by local and regional circumstances. In addition, North American commerce in crude oil flows inherently toward the United States – while, by contrast, a major benefit of continental cross-border trade in gas and electricity derives from those conditions that enable it frequently to be more of a two-way proposition. Besides removing some of the edge from instinctive Canadian and Mexican apprehensions about their giant Yankee neighbor, this composite situation gives an unusually leavening cast to an “energy interdependence” that brings heightened mutual benefits to all involved -- instead of invoking calculations of a zero-sum game. To quote U.S. Energy Secretary Spencer Abraham, it gracefully rejects any thoughts of “junior and senior partners”.¹⁷

The term “interdependence” itself has numerous meanings, with a dizzying variety of interpretations; and Chapter II considers these in more detail as applied to energy. A review of the WorldCat database disclosed about 2500 books that deal with the concept, including hundreds within the study field of international relations. Arguably, however, this segment of the IR literature has long been dominated by the classic offering of Keohane and Nye entitled *Power and Interdependence*¹⁸; and their treatment serves as a legitimate base point.

¹⁷ Remarks by Secretary of Energy Spencer Abraham at the 5th Hemispheric Energy Initiative Ministerial Conference, Mexico City, March 8, 2001.

¹⁸ Keohane, Robert O., and Nye, Joseph S., *op cit*. This is true of all three editions of the book, since the 2nd ed. (published in 1989) merely reproduced the 1977 edition, with the addition of a new preface and an “Afterword” that benefited from hindsight, new developments, and intervening critiques. References to this

Keohane and Nye repeatedly used energy examples in the exposition of their ideas about interdependence¹⁹; but their various parsings of the term need to be adapted freely at times if it is to be particularized fruitfully to an individual issue area such as energy. Keohane and Nye foresaw this constraint themselves. In the explanatory “Afterword” for the second edition of the book in 1989 they distinguished between “interdependence” as they had used the word in their original opening chapter (i.e., a very broad term that refers to “situations characterized by reciprocal effects among countries or among actors in different countries”) and “complex interdependence” – which they described as an “ideal type” that did not necessarily reflect world political reality in full detail, but which included characteristics of “a situation among a number of countries in which multiple channels of contact connect societies . . .”²⁰

The energy interdependence of North America bears this and other marks of “complex interdependence” (gleaned from throughout the work by Keohane and Nye); yet it is very much part of observable real-world experience, which introduces specialized terminology of its own. Thus, the dissertation should be of interest and value to at least two distinct categories of readers: 1) students of international regime formation and change; and 2) those who analyze the political economics of energy.

particular book will henceforth be made simply as “Keohane and Nye” (with page numbers applying to the amplified 2001 edition). Chapters have been rearranged slightly in the third edition, there has been some editing to remove outdated references to the Soviet Union in the present tense, and there are two new chapters that address “Globalism and the Information Age”. But the authors intentionally eschewed rewriting the basic book because they wished to emphasize that – even after one-third of a century – “the analytical framework of *Power and Interdependence* remains highly relevant for the understanding of globalization at the beginning of the twenty-first century.” (p. xvi)

¹⁹ It also happens that U.S.-Canadian relations were one example of complex interdependence they analyzed – contrasting them with U.S.-Australian relations.

²⁰ Keohane and Nye, p. 271.

The Keohane-Nye effort to relate a new systemic concept to neorealism led them to concentrate on asymmetries in “sensitivity” and “vulnerability”²¹ that were potential sources of power within a mutually dependent dyadic relationship. As newly defined and analyzed in the restricted example of North America, energy interdependence today invites more emphasis on mutual benefits in what is obviously not a zero-sum game. Power (not only in the classic sense of national military forces, population, and treasure, but even in terms of total natural resources and net energy-trade figures) is less important to how the associated international regime has developed and might change and/or be maintained. Nevertheless, energy interdependence need not be a polyannish concept, even though its essential goal is palpable improvement in the condition of all participants. As Keohane and Nye noted (p. 9), “the politics of economic and ecological interdependence involve competition even when large net benefits can be expected from cooperation.”

The presidential elections of 2000 in North America marked a welcome milestone in the evolution of the continental energy regime, but one of my contentions is that different voting outcomes at that time would not have ended the trend toward complex interdependence that had begun years earlier.²² At most, they might have modified the course and speed of its movement.

²¹ As the section on “Degrees of Interdependence” in Chapter III will bring out in more detail, energy interdependence makes all three countries more “sensitive” – i.e., more quickly responsive – to trans-border changes (favorable or unfavorable) within North America. However, they are less “vulnerable” to lingering damage from adverse changes, because interdependence offers opportunities to speed adjustment to shock. A rereading of Keohane and Nye, pp. 10-17, in this light shows clearly that those authors’ treatment of “power and interdependence” is advanced in part by this dissertation to consider “cooperative interdependence and resiliency”.

²² For a fuller discussion of this point, see Joseph M. Dukert, *The Evolution of the North American Energy Market*, Center for Strategic and International Studies, Policy Papers on the Americas, Volume X, Study 6, Washington, October 19, 1999, pp. 38-42.

It is true that U.S. President George W. Bush (a two-term governor of Texas with a special affection for his national neighbor to the south) and Mexican President Vicente Fox (a globalist businessman who had limited political ties to various problems of the past, because he represented a new party in power – the PAN) quickly built the closest relationship in history between their respective countries, while both reached out broadly to strengthen ties with Canada. Canadian Prime Minister Jean Chrétien also gave rhetorical support after his reelection to fruitful trilateral energy interaction -- even while publicly disagreeing with Bush's refusal to accept the Kyoto Protocol for a mandatory and fairly rapid rollback by all economically developed countries in the emissions of "global warming gases" (which are related largely to energy production and use).²³ But by the end of 2000 progress in the development of the gas-and-electricity regime had just about reached the point at which even a leftist, populist candidate in Mexico (Cuauhtémoc Cárdenas Solórzano, of the PRD) or an atavistic representative of the long-ruling PRI party there, such as Manuel Bartlett Díaz (who failed even to be nominated, but who may be a contender again in 2006), would not have found it easy to attempt total withdrawal from an energy regime that was far beyond a traditional political agreement. The same would have applied to a hypothetical victory in the United States by Democrat Al Gore – who surely would not have repudiated the continental trade overtures of Bill Clinton²⁴.

²³ Relations between President Bush and both his fellow leaders were strained in most respects by disagreement over the invasion of Iraq in 2003, but they have since been largely restored. Chrétien has been succeeded by fellow Liberal Paul Martin, who may be slightly more open to trilateral energy opportunities.

²⁴ Trying to develop a counterfactual scenario of North American energy cooperation within a Gore administration might be an entertaining challenge, but results would probably not have been vastly at odds with what happened. Gore's rhetoric about the Kyoto Protocol would have been different, endearing him to Chrétien; but it strains credulity to imagine that a Democratic administration would have dared submit the pact to the U.S. Senate for unqualified ratification.

The regime has already been designated above as a “meta-national” arrangement. As such, the amorphous regime itself holds and exercises power.²⁵ One might call it “situational power” -- emanating from the fact that while details of the regime might be modified by an exercise of conventional national power, it remains durable (and – to borrow Barrett’s phrase once again – “self-enforcing”) in its own right. The regime’s continued existence is clearly in the respective national interest of each partner, as well as in the interest of constituent sub-national entities that ultimately shape national policy.

This is why most politicians and commentators in all three NAFTA countries were simply chasing the wrong quarry when they first began to speak of a uniform “continental energy policy”.²⁶ That may evolve in time, just as President Fox’s vision of equally high living standards and open migration throughout North America might be realized several decades hence. But it will have to come in stages – for instance, through fairly mundane agreements on common definitions of energy and environmental terms, data measurements, and business or technical practices. Specific progress along these lines continues to be made through such bodies as the North American Energy Working Group (NAEWG), the North American Commission for Environmental Cooperation (CEC), and the North American Electric Reliability Council (NERC). Each is described later in the dissertation.

²⁵ This goes well beyond the more traditional observation by Keohane and Nye (p. xvi) that “asymmetries in such interdependence provided a form of power that states could use in very traditional ways.”

²⁶ Former Minister of Foreign Affairs Lloyd Axworthy was only one of a number of Canadian leaders to lambaste that term. He said on March 30, 2001, in the National Policy Association’s 10th Annual Walter Sterling Surrey Memorial Lecture in Washington, “A Changing North American Agenda”, that “the policy is continental in name only; there was no consultation, participation, or planning to ensure that it reflected the needs and interests of the continental partners or that it dovetailed with other priorities of a sustainable or environmental nature.” The lecture is excerpted at length in NPA’s publication, *Looking Ahead*, vol. XXIII, No. 2, pp. 8-11.

Absolute uniformity in statutes cannot easily be conceived without a reconciliation of the respective national constitutions and government institutions – which is essentially unthinkable on this continent at this time. Fortunately, energy interdependence does not depend on total homogenization. The regime can continue and thrive in a state of dynamic tension among partners and components within a limited common framework that is perceptible and reliable. Interdependence is all about accommodation to circumstances. Because a modern nation-state is more than a “black box”²⁷, examination of the subject regime also calls for some analysis of national policy formation. This reveals, in turn, how the very existence of the regime broadens the options available in pursuing goals. So many players are involved that the entire mechanism can be viewed as “spring-loaded”; and this makes quick response not only feasible but commonplace. A regime such as this does not lend itself to static diagramming . . . yet therein lies its strength.

Chapter IV in particular tries to draw a sketch from life of the regime, which is admittedly incomplete. Nevertheless, it is (so far as I know) the first attempt at such a description; and at least a rough picture such as this is essential to grasping a basic hypothesis. International interdependence in energy is a product of circumstances, which can survive adversity and achieve a vitality of its own. This could have important ramifications for contemporary study of international relations and world politics.

²⁷ Roger Hilsman, in attempting to describe realistically how some national policies are made, suggests that systems vary enough from country to country so that “The boxes . . . are not all black. Some are pink, some are purple, some are brown, and some are blue.” Yet he offers the advice that they “continue to be boxes in the sense that the analyst does not need to know what goes on inside them.” (Roger Hilsman, with Laura Gaughran and Patricia A. Weitsman, *The Politics of Policy Making in Defense and Foreign Affairs: Conceptual Models and Bureaucratic Politics*, Prentice Hall, Englewood Cliffs, NJ, third edition, 1993, p. 59). A serious student of an energy regime like this one, by contrast, had better look inside the boxes!

If this effort proves successful (in conjunction with Chapter VII's *schema* for understanding the bases of energy policy interest), it might even satisfy a gap that one Canadian journalist thought he still could see in the whole idea of continental cooperation. Edward Greenspon of the *Globe and Mail*, called the common interest of the three countries' leaders in a North American agenda "a sentiment in search of a vision".²⁸

Convergence of natural gas and electricity as elements of supply is a crucial part of the change that has taken place within the North American energy system (and indeed around the world). Today a single entity may offer for sale (immediately or for use in the future) gas, electricity, or the capacity to deliver either over great distances – even intercontinentally. Natural gas has been the fastest-growing large-scale source of energy in North America²⁹; and – despite its recent price volatility -- gas remains the preferred fuel in all three countries for new installations that generate electricity, in the interest of availability, efficiency, and environmental concerns.³⁰

U.S. consumption of natural gas has plateaued since 1996 – a statistical phenomenon most energy analysts have inexplicably failed to note.³¹ Nevertheless, demand for gas has continued to grow, bringing about the price and supply pressures to which Federal Reserve Chairman Alan Greenspan alluded in highly publicized

²⁸ Quoted by Axworthy, *loc. cit.*

²⁹ *IEO 2003*, Tables A5 through A-9.

³⁰ Natural gas is the cleanest-burning fossil fuel and the lowest in emissions of carbon dioxide – the most common compound associated with apprehensions about possibly adverse changes in world climate arising from human activities. Increasing demand for electricity continues to be linked closely to overall economic growth, and is also a worldwide phenomenon.

³¹ See Joseph M. Dukert, "What Do Natural Gas Numbers Show? . . . Surprise!" in *Dialogue*, U.S. Association for Energy Economics, vol. 11, No. 2, July 2003, pp. 30-32.

appearances before Congressional committees during the summer of 2003.³² I believe that successful cooperation within the North American gas-and-electricity regime can accommodate the growth in consumption projected by the Energy Information Administration without debilitating price increases. A new document scheduled to be published in the coming months by the North American Energy Working Group is intended to examine gas prospects on a continental basis, and an effort of this type can hold enormous significance for the future of the regime and the economic welfare of all three countries.

The collapse of an earlier effort to initiate significant gas trade between Mexico and the United States – which helped poison the always-tense atmosphere between those two countries for several years in the late 1970s -- invokes a convenient contrast in circumstances that assists the presentation of this dissertation’s core arguments. As Chapter VI explains, ongoing U.S. gas trade with Canada during 1977 was a major (though largely unreported) consideration in the breakdown of the U.S.-Mexican deal at that time. However, none of the four “necessary and sufficient factors” was in place then; so the time for a workable regime had simply not yet arrived. It has now.

Unlike oil and coal (which are sold around the world in an astonishing variety of different types and grades, and valued accordingly), pipeline-quality, “dry”³³ natural gas

³² Testimony of Chairman Alan Greenspan, “Natural gas supply and demand issues” before the Committee on Energy and Commerce, U.S. House of Representatives, June 10, 2003 (available at the Fed’s website – <http://www.federalreserve.gov/boarddocs/testimony/2003>).

³³ Production and consumption figures used in the dissertation will be for “dry gas” volumes unless otherwise noted. The primary constituent of natural gas as it emerges from the ground is methane, but it is mixed with a combination of other relatively volatile substances -- including a significant category known as “natural gas liquids” (NGLs). In North America, most of these are usually removed from the “wet gas” at an early processing stage, separated from one another, and marketed -- because they are chemically identical to the lighter fractions produced from crude oil during its refining process (e.g., ethane, propane, butane, and even aviation fuel). Because these products normally command a higher price in the U.S.

is perfectly fungible. So is electricity, when considered as a commodity in end-use. In fact, access by a single vendor to gas and turbine generators simultaneously can make gas and electricity essentially fungible with each other at a given location.

Even if oil is included, energy trade among the three partners in NAFTA represents a relatively small fraction of their total intra-pact commerce. But this belies the special role of energy in modern economies and societies – as the vigor of OPEC in international policy considerations over the past three decades testifies. Electricity in particular is an inextricable ingredient in development and “living standards”, so it is a constituent of the “wealth of nations” in today’s world. Natural gas is becoming so in regions such as North America, where its role is well established. The upshot is that the relative availability or scarcity of energy in almost any form is perceived quickly by ordinary citizens, putting it high on the agenda of numerous and diverse nongovernmental actors. This last point is especially important, since NGOs are so central in the North American gas-and-electric regime that has made energy interdependence viable.

When this particular regime is analyzed it satisfies tests by a variety of the approaches brought together by Krasner and others. In Krasner’s taxonomy I find personally most compelling the “modified structural” orientation, which sees “a world of sovereign states seeking to maximize their interest and power”, but for which “the basic function of regimes is to coordinate state behavior to achieve desired outcomes in

Midwest than they do in Canada, however, at least one major transnational pipeline has been designed to carry “wet” gas from Canada to a point near Chicago before the separation process takes place. The decision was based, of course, on careful economic analysis of a specific situation; and it is the exception rather than the rule. LNG from abroad, however, often retains enough traces of NGL so that the regasified fuel needs some form of additional handling upon receipt before it may enter the continental pipeline system.

particular issue areas.”³⁴ The issue area here, obviously, is energy policy in respect to gas and electricity; and a primary objective of the dissertation is to elucidate the way in which this regime can be a dynamic, interactive intermediary between basic causal variables and related behavior within the three countries. This very specific issue area reveals richer and more multi-faceted interaction than is displayed by the more general examples of Krasner, Keohane, and Nye.

Ernst B. Haas should be cited specifically for his linguistic and logical fine-tuning of the “interdependence” concept as it is demonstrated in this regime. Haas summarized what he considers “mainstream views” by explaining:

Complex interdependence means, among other things, that there is no fixed hierarchy of preference ordering for single actors or among actors. It also mean that ‘the state’ is disaggregated because of the presence of important transnational and transgovernmental actors. . . .

Thus the structure of the mainstreamers’ system contains some law-like constraining qualities (e.g., the role of market shares or the monopoly power of single firms), but it also sees structure as routinized bargaining behavior informed by relatively slowly changing perceptions of self-interest.

Interests remain the mainspring . . . accepting the short-run, self-perceived interests of actors as the important element, not the national or global interest as defined by someone else. . . .

Thus, regimes are arrangements to reduce the uncertainty engendered by such developments [as market failures and declining hegemonic stability], to maximize actor-perceived benefits and minimize costs despite the change in conditions. One of the primary purposes of regimes is to provide and diffuse information to enable actors to reduce uncertainty.³⁵

This dissertation includes a matrix of national energy policy goals that applies equally to each of the three trading partners, with a discussion of how continued and strengthened energy interdependence contributes to balancing the goals in each instance – even though specific policy targets and goals are not necessarily identical. Given the

³⁴ Krasner, p. 7.

³⁵ Haas, Ernst B., “Words can hurt you”, in Krasner, p. 52.

differences among the three countries in their traditional attitudes toward energy resources as a symbol of national sovereignty, for instance, it is fortunately irrelevant in the long run whether the ownership of those resources is public, private, or mixed – so long as the new rules of the game (embodied in the new regime) are generally observed.

How, then, does the regime change when it needs to? Modifications to the respective national energy strategies affect the three-country regime from time to time, but these are a resultant of domestic as well as international forces.³⁶ Thus, it is important to consider the basis on which internal decisions regarding change are reached and implemented. Drawing on my own personal experience with U.S. energy policy formulation, I adapt in Chapter VII the threefold analysis that Graham Allison (1971) applied to U.S. foreign policy and explain how comparable processes work into energy strategy in this country. I also considered several alternate explanations of foreign policy formation – such as those by Kohl (1975), Hillsman (1993), and Nathan & Oliver (1994), but concluded that they merely complement rather than negate Allison’s contentions.

Canada’s provinces are much more powerful *vis a vis* the central government than are U.S. states; but otherwise the approach to energy policy establishment is similar in concept. Mexico’s tradition had long been to reach consensus quietly within the Presidential palace, and the long-dominant party appeared to produce unitary direction; but the 2000 election wrought changes in both power-distribution and process, introducing new “game plans”. Thus a significant conclusion can be applied to all three

³⁶ Keohane and Nye point out forcefully that in forcing action “technological change, economics, and politics are closely connected but that none of these forces is dominant over the others” (p. xvii). While agreeing with that observation in general, this dissertation goes beyond it to suggest that – in the case of energy policy – some sort of balance is invariably struck among at least five fundamental goals (also treated in Chapter VII) and that perceptions may radically skew what decisionmakers still might insist is “rational choice”.

countries. The new energy regime encourages centrifugal as well as centripetal forces -- to the benefit of subnational and nongovernmental interests. Functional connections among them pass easily across borders, and this reinforces mutual energy dependence within the issue-specific regime.

The North American gas and electricity regime may exemplify only one specialized facet of the abstract “complex interdependence” concept postulated by Keohane and Nye. Still, its characteristics are readily observable, ultimately documentable, and subject to thoughtful scrutiny. Above all, it corresponds to the challenge with which those two authors concluded the 1989 version of their work:

We need to concentrate now on the interplay between the constraints and opportunities of the international system, including both its structure and its process, and the perceptions of interests held by influential actors within states. We need to examine how conceptions of self-interest change as a result of evolving international institutions, individual or group learning, or domestic political change. . . . For those willing to take up the challenge, the next decade could be an exciting time for scholarship.³⁷

³⁷ Keohane and Nye, p. 267.

II. OTHER USES OF THE TERM “ENERGY INTERDEPENDENCE”

Multiple Applications Are Inevitable

“Energy interdependence” can have different connotations in various contexts. (This is equally true of the term “energy security”.) To minimize confusion, though, some explanation is always in order in cases like this.

Roughly a quarter century ago, a few academic authors flirted briefly with the exact phrase that is mentioned repeatedly in this dissertation – “energy interdependence”. One book by Nazli Choucri even included the words in its title¹. But then it referred to the broad fact that the emergence of a global oil market after World War II had conspired with a series of nationalizations to produce a situation in which OPEC could crack the whip in fuel prices all over the world, while a few hitherto obscure countries in the region adjacent to the Persian Gulf were suddenly swamped with “petrodollars” that desperately needed to be recycled. The term “energy interdependence” seemed to fit.

It happens that these same two words are also perfectly descriptive of the narrower, contemporary situation outlined in Chapter 1. Considering cross-disciplinary links with international relations, economics, and political science (all of which examine “interdependence” in one context or another), the appropriateness of “energy interdependence” as a designator here seems to be overwhelming.

During the past decade the situation in respect to natural gas and electricity (including marketing techniques, price transparency, opportunities for competition, and access to physical delivery systems) has changed so radically that their modern

¹ Nazli Choucri, *International Politics of Energy Interdependence: The Case of Petroleum*, D.C. Heath, Lexington, MA, 1976.

interrelationship merits a distinctively identifiable designation. Within the industry it is normally called gas-and-electricity “convergence”; and that term applies equally in domestic and multinational endeavors. But convergence itself can affect the economic and the political relations of nations (especially contiguous countries that are energy trading partners) in an extraordinary way; and the results are sufficiently novel to justify an appellation of their own. Those results are what I choose to call “energy interdependence”.

Careful distinctions are warranted also among terms that simply sound as if they could be related to one another. During the 1970s and 80s, any reference to international “interdependence” might have been misunderstood as being a direct offshoot of ideas about international “dependency” – a neo-Marxist image of the world system as one in which economically developed states at the core exploited those at “the periphery” that lagged but were kept in thrall by ties they could never loosen. As Choucri used it more than a quarter century ago, “energy interdependence” had at most an ironic association with “dependency theory” By contrast, the idea of “energy interdependence” appeared at that time largely in response to chauvinism within advanced economies such as the United States, scratching for some way to break loose from any perceived dependence on such backward national upstarts as Libya, Kuwait and Saudi Arabia.

Doran, in fact, devoted a brief discussion in *Myth, Oil, and Politics* (pp. 119-20) to “dependence”. He noted in part, however, that:

If the oil producing countries were in fact politically and economically dependent upon the advanced industrial countries before 1973, the reverse is the case in 1977. The industrial consumer countries are at the mercy of OPEC policy today. But this raises the questions of how long oil markets will remain out of competitive disequilibrium and of whether dependency is a function of political power considerations or market

supply and demand conditions, or both.

Doran was prescient to question the durability of dependence and of “how long markets will remain out of competitive disequilibrium”. Oil prices plunged a few years later, as demand was curbed while new sources appeared; and OPEC supremacy collapsed. Elsewhere, Doran described this relationship of OPEC control and counteraction by the oil-importing countries as “co-dependence”.

North American energy interdependence is quite different from the relationship between OPEC and the oil-importing countries. North American interdependence is marked by local imports and exports of gas and electricity at various locations along the U.S. border with Canada and Mexico. The largest producer nation is also the largest consumer. The smaller nation actors are strong net exporters of energy overall. Cooperation and stability marks the energy association among the three actors. Attempts at “control” and “dominance” are strikingly absent.

Global Oil Relationships

The administration of U.S. President Richard M. Nixon met the challenge of the Arab Oil Embargo and subsequent sharp increases in the world price of oil with a rhetorical scarecrow dubbed “Project Independence”. It was a Fortress America approach, pledging (with no basis in fact or analysis) that the United States would be able to meet its own energy requirements entirely on the basis of domestic programs by 1980. After President Nixon’s resignation, successor Gerald Ford loyally allowed the new Federal Energy Administration (FEA) to pursue this quixotic goal – at least to the extent

of evaluating its feasibility. The result was a 339-page report² that took a step back from the “energy independence” target . . . and hinted that further retreat might be advisable:

“The FEA study is not a “blueprint” for reaching zero imports by 1980, nor does it make specific policy recommendations.”³

Although \$11 world oil prices make achievement of self-sufficiency easier, the United States is still better off economically with lower world oil prices. The implementation of a limited number of major supply or demand actions could make us self-sufficient. By 1985, we could be at zero imports at \$11, and down to 5.6 MMBD of imports at \$7 prices.

Not all of these actions may be warranted, but they indicate we have significant flexibility when one considers:

- Some projected imports in 1985 are from secure sources.
- Some insecure imports can be insured against.
- Not all of the supply and demand actions must be implemented to achieve the desired results.⁴

The report went on to note that “we can pick from those [options] that make the most economic, environmental and regional sense.” But it cautioned that various of these actions would “adversely affect environmentally clean areas . . . require “massive regional development in areas which may not benefit from or need increased supply” . . . “gamble on as yet unproved reserves of oil and gas” . . . necessitate “intervention and regulation in previously free market areas” . . . and result in “increased nonmarket costs due to more limited individual choice and changed lifestyles.”⁵

As if these disincentives might not be sufficient to discourage those who would push toward “energy independence” anyway, the FEA study wound up its review of “Policy Implications” by admonishing that a crude oil storage program (one option that

² Federal Energy Administration, *Project Independence Report*, U.S. GPO, Washington, November 1974.

³ FEA, *op. cit.*, p. 1.

⁴ *Ibid*, p. 14

⁵ Chapter VII will illustrate how these basic policy questions and the need for acceptable trade-offs among goals persist over the decades.

was adopted later⁶) “would take a few year to implement”, during which time “our vulnerability will be greatest”, and would actually call for a boost in imports at first, which would “act to sustain cartel prices in the near term”.⁷

The Congressional Research Service was even more direct in debunking the “go it alone” approach in averting “oil crises”. Barely 18 months later (i.e., while Ford was still in office), it produced a thick descriptive and analytical document that went so far as to christen what it considered the proper energy policy course for this country “Project Interdependence”. Its opening words were: “Short of draconian measures to be taken by the executive and legislative branches of Government, ‘Project Independence’ goals now seem unattainable.”⁸ The closing sentences of its executive summary were: “Consumers and producers of oil can no longer afford to go separate ways. All nations need to work together to resolve problems which affect all countries in an era of growing global interdependence.”⁹

Two years later, another CRS study adopted the same phrase and painted an even grimmer picture of the situation: “Assuming it is in the interest of the entire free world to promote orderly economic development, the industrial nations and the oil producing states of the Middle East must succeed in working out a political and economic formula

⁶ A U.S. Strategic Petroleum Reserve was technically established under President Jimmy Carter – i.e., after Ford left office; but its serious implementation had to wait four more years for Carter’s successor, Ronald Reagan.

⁷ *Ibid.*, pp. 14-15.

⁸ Franssen, Dr. Herman T., *Towards Project Interdependence: Energy in the Coming Decade*, a report prepared in response to a request from the Joint Committee on Atomic Energy of the U.S. Congress, U.S. GPO, Washington, December 1975. (The study was sent initially to Committee Member Howard H. Baker, Jr., on September 29, 1975).

⁹ *Ibid.*, p. xv.

which will avoid potential catastrophe.”¹⁰ At the same time, Doran was writing (in a chapter on “Desanctifying Oil Myth: New Political Relations?”) that “Interdependence is possible where a substantial volume of trade transcends fissiparous issues of politics for both partners. . . . Interdependence entails at least nascent erosion of power politics.”¹¹

It is clear that these early uses of the term “energy interdependence” focused on the need to reconcile divergent interests between groupings of oil-consuming and oil-producing nations. This is underscored by the very title of a series of U.S. Congressional hearings held in January 1977, just before Carter’s inauguration: *Energy Independence or Interdependence: The Agenda with OPEC*.¹² One statement by a witness during the sessions also illuminates how the term “energy independence” had been watered down still further by that time: “The official U.S. energy strategy since 1973 has sought to reduce U.S. oil imports to a point where the United States would no longer be vulnerable to another embargo.”¹³ [emphasis added]

The same team of witnesses listed one goal of Project Independence as a reduction of U.S. oil imports to about 6 million barrels per day by 1985 (without reference to price), but added the opinion that “There is, however, a growing realization that the direct and indirect costs of fully implementing this program would be

¹⁰ Congressional Research Service, *Project Interdependence: U.S. and World Energy Outlook through 1990*, U.S. GPO, Washington, June 1977.

¹¹ Doran, *op. cit.*, p. 181. In the same passage, he referred to an earlier work by Richard Cooper (*The Economics of Interdependence*, McGraw-Hill, New York, 1968) and cited the idea that “Properly used the term ‘interdependence’ has its largest meaning when applied to pairs of states of roughly equal economic size, level of development, and modernization.” NAFTA (one of the constituent factors in the creation of the North American gas-and-electricity regime) has modified this way of thinking.

¹² *Energy Independence or Interdependence: The Agenda with OPEC* (Hearings before the Subcommittee on Energy of the Joint Economic Committee, Congress of the United States, 95th Congress, First Session, January 12 and 13, 1977, U.S. GPO, Washington, 1977).

¹³ James W. Howe and William Knowland, “Energy and Development: An International Approach”, *ibid.*, p. 92.

enormous.”¹⁴ The chairman of the subcommittee, Senator Edward M. Kennedy, reminded those present that relationships might exist “between the interests of the United States in acquiring reliable sources of imported oil at reasonable prices and the need for restructuring the world economy, with special concern for the problems of developing nations.” Kennedy conceded that:

After 2 years of active consideration of these issues, I am convinced that the U.S. energy program will remain in limbo until we decide how to deal with the reality that this country will be importing substantial amounts of oil for most, if not all, of the balance of this century. And even if, by some miracle, we could become self-sufficient in energy our closest allies overseas will still be heavily dependent on oil imports. In this sense, the issue of energy independence is a mirage.¹⁵

Although I cannot point to any outright discussion of an “energy regime” in those exchanges, it is obvious that this is what was under consideration – whether it was to be achieved by imposition, negotiation, or simply cut-and-fit development. And this still characterizes the approach of some international energy specialists. In the mid-1990s, two Italian authors produced a book entitled *Perspectives of Oil and Gas: The Road to Interdependence*, in which they strove to update an econometric modeling effort dating from 1981 and thereby revive a proposal for a structured *modus vivendi* between Arab oil producers and the large oil-importing nations. They described its advantages in terms of mutual benefit to exporting countries and the developed nations of the Organization for

¹⁴ Historical statistics in EIA’s ever-useful *Monthly Energy Review* show that the 6-million-barrel target was actually over-reached . . . but not without cost. U.S. net oil imports were actually cut in half between 1977 and 1985 – from about 8.6 million barrels per day to approximately 4.3 mmbd (the low point in modern history). But the chief reason for such a dramatic reduction in U.S. oil consumption was OPEC’s blunder in forcing prices up too much too quickly. The landed price of each imported barrel nearly doubled – from somewhat over \$14 to almost \$27 (nominal dollars). I have calculated that the direct cost to the country’s current account over those eight years was reduced by only 7.7 percent. And -- once “easy” fuel-switching, conservation, and efficiency measures were exhausted -- U.S. dependence on oil imports climbed rather steadily after that with the growing economy. Since 2000, net imports have remained well above 10 mmbd, and they now exceed 12 mmbd.

¹⁵ *Ibid.*, pp. 2-3.

Economic Cooperation and Development (OECD) that initially established the International Energy Agency (IEA) as a sort of “oil consumers’ cartel”. Although they failed to offer specifics on how this might be accomplished, they added a recognition that the days of “posted prices” and “price controls” had passed . . . and that this was fortunate:

If consumers and exporters have the same objective, they could very well pursue it together, now that the contentious issue of oil prices has fallen into the hands of a market which is scarcely prone to manipulation, and can therefore be considered ‘impartial’.¹⁶

Particularizing, Narrowing, and Refining a Definition

There is some continuity between these usages of “energy interdependence” and the one formulated for this dissertation. IEA itself is often considered to be a regime, as is OPEC (despite its frequent displays of failed discipline). But there are also marked differences.

In the context of the dissertation, interdependence is limited to a triad of adjacent countries rather than a global concept. The new North American regime for gas and electricity applies to two-way exchanges of both commodities, so it more closely resembles the worldwide oil market itself in miniature than it does either IEA or OPEC.¹⁷ As explained earlier, North America is almost totally self-sufficient in gas and electricity – energy sources that are themselves now “interdependent” (in yet a different sense of the

¹⁶ Colitti, Marcello, and Simeoni, Claudio, *Perspectives of Oil and Gas: The Road to Interdependence*, Kluwer Academic Publishers, Boston, 1996, p. 132. These authors perceived the common objective of oil buyers and sellers to be “steady economic growth world-wide, with an accelerated development in the poorer areas”. This view might be open to some dispute, as would their suggestion that price is no longer subject to oligopolistic manipulation – in light of OPEC’s current avowed practice of adjusting production on the basis of a price band for its chosen basket of crudes.

word). Most significantly, this dissertation deals with a situation in which a regional cooperative approach has already been achieved. The countries involved are simultaneous buyers and sellers of the two energy sources at issue, and they expect to continue as such -- with increased trade volume -- for some time to come. That is why the abstractions of international political analysis must now be concretized by an exposition of the current energy picture for all three NAFTA partners -- the task of Chapter IV.

Power and Interest – Contrasting Oil with Gas & Electricity

Especially for those who might still tend to equate “energy” with “oil”, however, it is important to reiterate that a major component of energy has not been idly omitted by the focus on gas and electricity. There are some ways in which one can discuss “oil interdependence” in respect to Canada, Mexico, and the United States; but those links are of quite a different nature from the ones that form the core of discussion in this dissertation. The explanation is not simple.

There is no “oil regime” that is exclusive to the three countries of North America. International oil relationships are part of a different system (the global oil market), where relative power depends on such factors as the number of “exportable barrels” of that vital product a country can muster. This type of power-base is what has given Saudi Arabia -- with enormous oil reserves and among the lowest exploration, development, and production costs in the world -- such influence. It has also provided Canada and Mexico from time to time with some extra leverage in negotiations on various topics with its larger, much richer, militarily dominant North American neighbor. Yet one cannot say

that there is a North American oil regime in the same sense as the one that trilateral interdependence in gas and electricity has produced.

Crude oil varies considerably in viscosity, sulfur content, and impurities; but these are differences that can be handled during the refining process (although often at an extra cost that is reflected in a price differential among grades and types). Thus, oil is a relatively fungible commodity. The emergence of non-OPEC fields as alternative sources in the 1970s demonstrated that embargoes on oil exports are far less effective than they were originally perceived to be in shutting off supply to targeted countries (especially as more and more marginal-cost oil producers found it economic to operate). Nevertheless, the Saudis -- by acting as “swing producer” through rapid and sharp changes in exports -- can still single-handedly move the price of oil more nimbly (if not always painlessly) than any other country on Earth. That is a mighty weapon. By withholding exports to the international market, Saudi Arabia has the power to impose an economic penalty on any and all petroleum-importing countries (while providing a net revenue benefit to most of its fellow members of OPEC) through price escalations that raise costs for transportation, manufacturing, processing, commerce, and ordinary day-to-day living for most of the rest of the world.

The numbers change from year to year; but Canada and Mexico have each come to supply this country annually with roughly the same level of crude oil as Saudi Arabia (and more than Venezuela). However, this is a matter of national choice and industrial convenience – because of supply-security concerns and proximity, respectively. Saudi Arabia actually loses several dollars in its “netback” price on each barrel shipped to the United States, as compared with what it might derive by selling the same amount to a

customer that is closer; but it accepts that income penalty in order to maintain its trade volume (and “market share” . . . and bargaining power) with a superpower that has proved itself ready and willing to defend Saudi stability. As another result, some U.S. refineries have adapted both equipment and procedures to using “Saudi light crude” instead of “West Texas Intermediate” – which generally commands an additional price premium because of its “sweet” (low sulfur) characteristics.

The Saudis’ flexibility in oil production and exports is the key to their unique position. The United States usually buys only about one-fifth of the crude oil they export. Also, Saudi Arabia is usually capable of maintaining a great deal of “spare” production capacity -- often amounting to two or three million barrels a day, or nearly as much as we buy now from Canada and Mexico combined. By comparison, Canada and Mexico typically produce crude at close to their full capacity; and they count on selling the bulk of their exports to the United States. Thus, it is simplistic (although rhetorically effective) to equate the oil market significance of these three countries *vis a vis* the United States with barrels of our imports.

A disruption of U.S. oil trade with either Canada or Mexico would necessitate massive shifts within the industry and would be damaging economically to all concerned. Within the world oil market, however, there is little doubt that the imports of crude oil from either one could be replaced – albeit after an inconvenient period of adjustment and probably at higher feedstock cost in addition to the expense of modifying refinery procedures.

Why is it, then, that the North American Energy Working Group chose not to establish an “Oil Sub-Group” at the very start of its operation to address trilateral modes

of cooperation in that fuel source? There are, after all, subgroups of NAEWG that deal with gas and electricity. Diplomatic sensitivities might have had something to do with it, but I can see other reasons:

First, the possibilities and problems in the case of petroleum are primarily bilateral rather than truly trilateral. Most Canadian oil comes into this country by pipeline; but Mexican deliveries have traditionally been by coastwise shipping, and this also the case for the transport of U.S. petroleum to eastern Canada. An interconnected tri-country oil network does not exist . . . and probably never will. Second (as explained earlier), the potential for North America's complete "energy independence" in respect to oil is virtually nil -- unless Canadian oil sands are developed to their fullest some day. An autonomous North American market for oil at this stage makes relatively less sense than one for either gas or electricity. Third, one cannot point out too often that gas and electricity are themselves interdependent (and even mutually fungible in the market to a certain degree), while the link between oil and electricity has declined steadily in North America for a host of reasons. In 1973, petroleum was the fuel for about one-sixth of all the electricity generated in the United States; but for years now its share as a domestic generating fuel has hovered at only around three percent. Finally, regulators at various levels of government are important actors in the gas and electricity framework within the three countries; but today they have much less to do with oil than they once did.

Since the primary consumption of oil on the continent is in the transportation sector, and since the main consumer is the ever-growing fleet of motor vehicles in all three countries (which are involved in a continental auto industry) it is always conceivable that a North American oil regime of sorts will develop some day. The

motivating force then might even be related more to relative power than to mutual interest – the guiding feature of the regime considered in this dissertation. But if a North American oil regime emerged it would be for a different set of reasons, would involve a different cast of actors (with different relative influence), and would probably be structured somewhat differently. Overall, that is why the description of the continental energy market in the next chapter highlights gas and electricity.

III. THE EVOLVING NORTH AMERICAN ENERGY MARKET

Background and Current Situation

Because North America overall is not nearly self-sufficient in oil, an important fraction of its petroleum must depend on overseas suppliers for years to come. At the same time, North America itself is a contiguous energy market of huge dimensions -- the largest the world has ever seen, even surpassing the recently enlarged European Union. Considering all primary sources of energy combined, North America accounts for more than one-quarter of global production and nearly 30 percent of the planet's energy consumption.¹

At the time the North American Free Trade Agreement (NAFTA) went into effect on January 1, 1994, however, the *International Energy Outlook* of the U.S. Department of Energy's Energy Information Administration had not yet even begun to treat North America as a distinct region.² The designation "North America" was used in its Table 6 ("World Crude Oil Reserves"), but apparently only to differentiate Mexico from the major South American source of oil, Venezuela. Mexico was generally lumped under "Other Countries". Canada was listed separately in several connections, but never associated statistically with the United States or Mexico; and electricity trade on the continent was not even mentioned. The only hint of energy trade potential on a significant scale came in the *Outlook's* discussion of "Prospects for Natural Gas".

¹ United States Energy Association, *Toward a National Energy Strategy: Toward an International Energy Trade and Development Strategy*, Washington, October 2001, pp. 17ff.

² Energy Information Administration, U.S. Department of Energy, *International Energy Outlook 1993*, Washington, April 1993.

After projecting increases in U.S. domestic production of natural gas for a dozen years (counting largely on unconventional gas recovery technologies and a pipeline to deliver gas from Alaska to the Lower 48 States which still has not been built), *IEO 1993* suggested that growing U.S. demand would make Canada a necessary source of this fuel for the United States. It added that gas trade with Mexico should also increase substantially in the future as a result of NAFTA, with that country becoming “a net exporter of natural gas to the United States around 2010”.³

In fairness, it should be added that DOE was ahead of another U.S. federal cabinet department in adjusting formally to the new realities brought about in part by NAFTA. The State Department did not create a regional bureau for the Western Hemisphere until the late 1990s. Before then our diplomatic establishment dealt with Canada organizationally as part of Western Europe . . . and lumped Mexico into a bizarrely heterogeneous “Latin America”.

Clearly, the North American energy market has developed far more rapidly than was generally thought possible as recently as the late 1980s. Tariffless trade among the three partners in oil and refined products, natural gas, electricity, coal, and energy technology now moves across borders regularly in both directions. Energy prices are volatile, so merchandise values change; but this trade is in the range of U.S. \$50 billion annually.

From the standpoint of pure commodity volume, the combined U.S. imports of petroleum from Canada and Mexico more than doubled between 1978 and 1990 (from 785 million barrels a day to 1689 mmbd); and they nearly doubled again during the

³ *Ibid.*, p. 25.

decade of the 90s (to 3,180 mmbd for 2000). Continental electricity trade increased by 50 percent from 1978 to 1990, and by 2000 it was almost three times what it had been in 1978. But the most dramatic (and perhaps least noticed) rise was in two-way natural gas trade across the northern and southern U.S. borders. It went from 885 billion cubic feet in 1978 to just under 1.5 trillion cubic feet bcf in 1990 . . . and to almost 3.7 tcf in 2000.⁴

These three years are carefully chosen to benchmark the growth in trading volume. Chapter VI will explain why the late 1970s might have been propitious for earlier moves toward energy interdependence, but failed to be so because conditions were not yet quite ripe. The 1990s marked a gradual progression from inchoate exchanges to the true gas-and-electricity regime described in Chapter IV. And 2000 brought a succession of shocks that tended to slow forward movement, although the regime continued to consolidate and its overall momentum persisted.

Attempts to relate regime development to trade statistics alone, however, would miss the point. In fact, the energy establishments of the three countries (including the state monopolies in Mexico) have become intertwined in a way that invites a cooperative search for energy solutions that has no real historical precedent.

The current national administrations in all three countries are disposed to encourage North American energy trade, although there is considerable rhetorical resistance (especially in Canada and Mexico) to suggestion of a common continental energy policy. In a politically more realistic approach, the North American Energy Working Group (NAEWG) was established in 2001 to bring together representatives of the energy ministries of Canada, Mexico, and the United States on a continuing basis.

⁴ MER, March 2004, Tables 3.3e, 3.3f, 7.1, and 4.3.

This trilateral group's mission is to explore modes of energy cooperation – not limited to energy commodity trade -- among the members of NAFTA.

In announcing his administration's initial effort to formulate its own distinctive National Energy Policy early in 2001, President Bush specifically mentioned energy trade with Canada and Mexico; and the policy proposal itself commends movement "toward a North American energy framework" and the continental working group initiative.⁵ Under the statute that established the U.S. Department of Energy in 1977, such a document is required every two years as a report to Congress; but the biennial schedule has often been ignored. Furthermore, although many of the Bush administration's suggestions on energy policy were carried forward administratively (by various departments and agencies within the federal executive branch), some of the key elements of the so-called "Cheney Report" could not be implemented without Congressional approvals, cooperation from the States, and private-sector initiatives. For example, in the fourth year since George W. Bush became President, construction has still not begun on a gas pipeline from Alaska to the Lower 48,⁶ and only marginal progress has been made toward a national grid for U.S. electricity that would make transmission links throughout North America maximally useful.

⁵ *National Energy Policy*, Report of the National Energy Policy Development Group, Washington, May 2001 (popularly referred to as "the Cheney report"), pp. 8-8 and 8-9.

⁶ A breakthrough may have occurred early in 2004, when MEHC Alaska Gas Transmission Company, a subsidiary of MidAmerican Energy Holdings (itself an affiliate of Warren Buffett's Berkshire Hathaway) filed the first of a series of applications needed to build a 745-mile, 48-inch, \$6.3 billion gas pipeline with an initial capacity of 4.5 billion cubic feet per day from Alaska's North Slope to the border of Canada's Yukon Territory near Beaver Creek, where it would link up with a new Canadian connection to the major pipeline system serving virtually every market center in Canada and the Lower 48 States. A competing proposal from Exxon Mobil, ConocoPhillips, and BP followed within hours. MidAmerican contended that "the economics justify" the project, even without long-sought U.S. federal support, and said it hoped for a construction start by 2007 that would move the first gas through the open access pipeline by 2010 – in time to compete directly with LNG facilities that are supposed to be operating within North America by then.

A thoroughgoing and effective U.S. energy strategy requires action by the federal, state, and private sectors. It should consider not only oil, natural gas, and electricity, but also refined petroleum products, coal, nuclear power, renewables, R&D, energy efficiency, investment, equipment, services, infrastructure, and regulatory regimes. “Thinking continentally” along such broad lines will take even more time, understanding, and patience, since political, economic, and cultural differences among the three partners must be taken into account.⁷

This dissertation concentrates on the converging gas and electricity sectors, because their continental integration has already been achieved to a large extent -- accompanied by the development of a regime that embodies and reflects subtle and sophisticated self-adjusting mechanisms that all three countries accept.

Energy Mix in the Three Countries

The North American continent is home to about 7 percent of the world’s population; but these 409 million people accounted during 2000 for about one-third of the planet’s gross domestic product – roughly 5 times the world average per capita. This explains (in part) why their total energy consumption per capita was about four and one-half times the world average. Canada, despite a population only one-third the size of Mexico’s and one ninth that of the United States, was the sixth largest energy consumer in the world in 2000 – surpassing India, which is more than 30 times Canada’s size. Together, the NAFTA countries accounted for a 31 percent share of the global demand for oil, 31 percent of all natural gas, 30 percent of electricity, and 24 percent of coal consumption.

⁷ These factors will be treated further in subsequent chapters, especially Chapter VII and Chapter VIII.

Almost the first task the NAEWG announced for itself was to reach agreement on a single “Energy Picture” of the continent – using clear assumptions, comparable units of measurement, and authoritative current data. The U.S. Department of Energy’s Energy Information Administration (EIA) was assigned a leadership role in assembling the necessary facts and figures, but it was agreed that the basic information about each country would be supplied and sanctioned by the respective national energy department. This meant that the assumptions underlying individual sets of projections to 2010 in “Energy Picture” might not be identical, but such assumptions would be identified in a final section. Thus, the assumptions in each case gave clues to the policy thinking in each country that guides “official” energy planning.

The NAEWG document was originally supposed to have been ready by the end of 2001; but concurrence on its contents proved elusive – which has been a characteristic of the group’s activities that could have been anticipated. A trilaterally “acceptable” version was finally approved at the third face-to-face meeting of the NAEWG in Mexico City May 9-10, 2002, and posted on official internet sites a few weeks later.⁸

Not unexpectedly, some valuable elements were left out during the consensus process. For instance, there were: 1) no sectoral breakdowns of energy consumption, 2) no estimates of emissions associated with energy production and use, 3) no discussion of pricing structures or other extra-market effects on supply and demand, and 4) no analytic evaluation of apparent trends. As a result, *North America – The Energy Picture* fell short

⁸ *North America – The Energy Picture*, prepared by the North American Energy Working Group, June 2002. In the rest of this dissertation, the document will be cited simply as “Energy Picture” -- with pagination based on the English-language text printed by the U.S. Department of Energy. It is also available on the Internet in French and Spanish. See: <http://www.nrcan.gc/es/energypicture/index.html> and <http://www.eia.doe.gov/emeu/northamerica>. The document index at the Mexican Energy Ministry’s site is at <http://www.energia.gob.mx/sener/docs>.

of being the continental portrait it could have been and should become as it is updated and revised.⁹ Nevertheless, it is a helpful reference and is used as a primary source herein, in preference to the less compatible “bits and pieces” that had to be assembled on an *ad hoc* basis before its publication. Where gaps occur, I have drawn on what I considered the most trustworthy sources available from the three countries.

Canada, Mexico, and the United States are all both importers and exporters of energy.

Yet they differ from one another in many respects (see Tables 1-3 and Figure 1)

Table 1. Major Forms of Primary Energy Consumption (NAFTA Countries, 2000)¹⁰ (Quadrillion Btu)

<i>Country</i>	Petroleum	Natural Gas	Coal	Hydro	Nuclear
Canada	4.05	3.37	1.49	3.17	0.78
Mexico	3.90	1.46	0.25	0.34	0.08
United States	38.40	23.11	22.5	3.09	8.01

Table 2. Percentage of Energy Consumption by Sector (NAFTA Countries, 1998E)¹¹

<i>Country</i>	Residential	Commercial	Industrial	Transportation
Canada	17.7	15.5	48.0	18.9
Mexico	15.9	04.6	54.7	24.8
United States	19.4	15.8	38.2	26.6

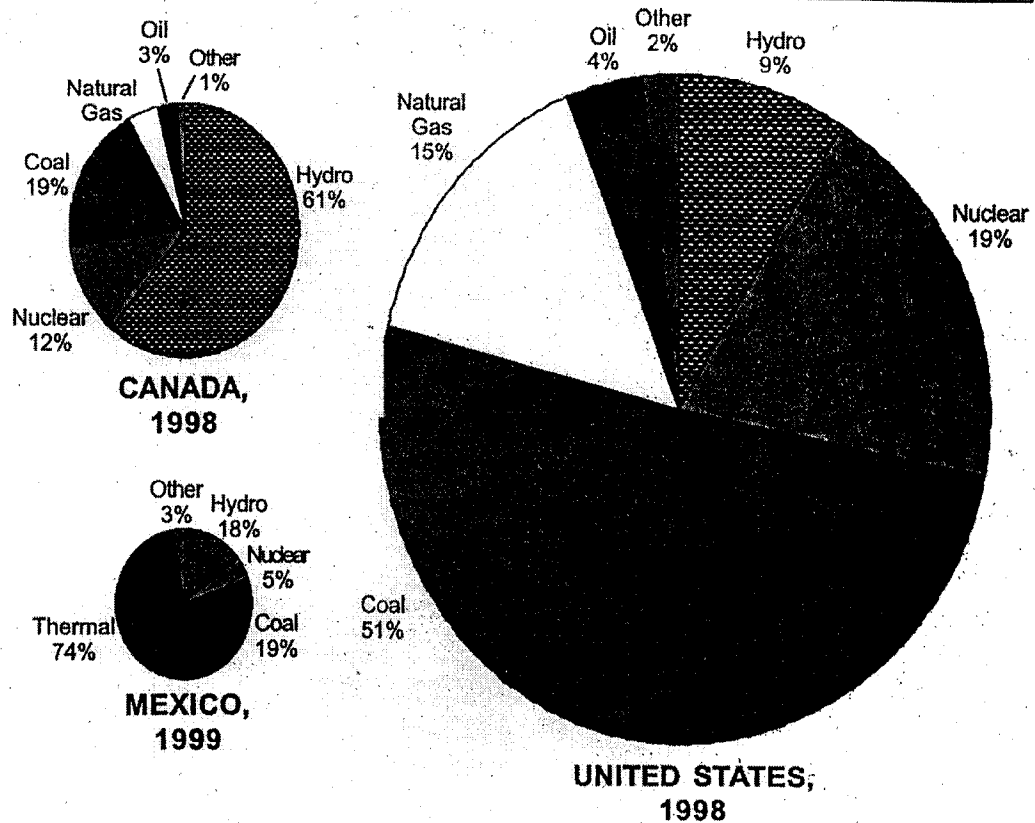
⁹ For a fuller critique (with specific recommendations for improvement), see Joseph M. Dukert, “New Initiatives in North American Energy Cooperation”, *International Association for Energy Economics Newsletter*, 2nd Quarter, 2003, pp. 4-8. A second edition of “Energy Picture” was promised during 2004, with more attention to the demand side of the energy equation; but its publication was delayed as national elections approached, and the new version will probably still not include data on environmental effects associated with energy.

¹⁰ Data drawn from Tables E2, E3, E4 and E5 of Energy Information Administration, U.S. Department of Energy, *International Energy Annual 2000*, Washington, May 2002 (henceforth referred to as “*IEA 2000*”). For a variety of reasons, the numbers do not add up to the totals given in Table E1 for the three countries: Canada 13.07 quads; Mexico 6.18 quads; U.S. 98.79 quads. Nevertheless, the comparisons by energy source are valid and illustrative of differences in both consumption volume and energy mix.

¹¹ Data from EIA’s “Country Analysis Briefs” for the respective countries: Canada, February 2002; Mexico January 2002; United States May 2002. These useful documents are revised periodically and are available on the Internet at <http://www.eia.doe.gov>.

<i>Country</i>	CO₂ equivalent (metric tons)	Sulfur Dioxide (metric tons)	Nitrogen Oxides (metric tons)	Mercury (kilograms)
Canada	122,000,000	650,195	290,211	1,975
Mexico	90,095,882	1,683,199	244,380	1,117
United States	2,331,958,813	12,291,107	5,825,982	39,241

Fig. 1 — Net Electricity Generation (by Fuel) in Canada, Mexico, and the U.S.



Adapted from data supplied by the Canadian Electricity Association. "Other" includes biomass combustion and other non-hydro renewable energy.

¹²Commission for Environmental Cooperation of North America, *Environmental Challenges and Opportunities of the Evolving North American Electricity Market*, Secretariat Report to Council under Article 13 of the North American Agreement on Environmental Cooperation, June 2002, Table 4. Note that some of these data are estimates and not all data come from 1998. See Section Three of symposium working paper 2 for further discussion. For even fuller treatment, consult Symposium Working Paper 3, "Estimating Future Air Pollution from New Electric Power Generation," 22 October 2001.

A few contrasts become evident immediately. As of 2000, Mexico relied much more heavily on petroleum than either Canada or the United States; and it devoted the largest relative amount of primary energy to industrial use (much of this actually being consumed by Pemex). Canada's very heavy use of hydro facilities for electricity explains why it has fewer emissions from combustion products in proportion to its total generation. The United States derives a comparatively large volume of its domestically produced electricity from nuclear power plants; but its generating sector is by far the most closely wedded to coal as its primary fuel. However, this was merely a snapshot at a recent moment in time. For example, Mexican emissions per unit of electricity generated are declining as it continues to shift from high-sulfur, heavy oil to natural gas as the preferred fuel for power plants; but its total production of electricity is growing much more rapidly than that in the other two countries. It is safe to assume also that some other relationships shown here will change -- even within the next decade, and almost certainly over the next 20 years. Thus we need to take a closer look at the individual countries.

The United States is obviously the core of the North American energy market, and nothing short of a major upheaval could change this situation. This country is the largest producer of energy in the world, yet it is the largest single national consumer on Earth too -- forcing it to import more than one-quarter of its total energy requirements. This includes more than half of its oil (chiefly because of high demand in the U.S. transportation sector -- which absorbs by itself more petroleum than the entire continent produces).

After the breakup of the Soviet Union and the collapse of the Russian economy, the United States matched or exceeded Russia in production of crude oil through much of

the 1990s.¹³ In fact, during the 1980s the United States had often surpassed even Saudi Arabia in annual petroleum output, although that was because the Saudis were acting as “swing producer” in order to limit OPEC’s total production and thus support world oil prices. Nevertheless, the United States must rely on “stripper wells” (those that produce only 10 barrels per day or less) for the bulk of its onshore production in the Lower 48 States; so production costs are relatively high, and its ultimately producible oil resources do not approach those in the Middle East. Technological improvements in recent years have made it cheaper, easier, and less time-consuming for the United States to find and lift oil from the ground; yet production figures have been slowly but steadily declining – even in Alaska. Today, U.S. oil production lags far behind Saudi Arabia and Russia, though it still roughly equals that of Canada and Mexico combined.

The U.S. story in natural gas is somewhat different (in part because gas use was restricted principally until after World War II to the regions where the fuel was a byproduct of oil wells, and exploration for gas in its own right has been pursued seriously here for only about half that time). Estimates of recoverable U.S. gas resources are still rising; but domestic proved reserves¹⁴ dipped in 1999 (for the first time in five years), because the relatively low price of gas and the preoccupation of large oil companies over several years with corporate mergers, acquisitions, and restructuring had temporarily reduced capital investment in exploration.

¹³ Recently U.S. officials have taken a special interest in encouraging growth of the Russian oil production capability as an offset to the overwhelming power of Persian Gulf countries (including Saudi Arabia) in the world market.

¹⁴ “Proved reserves” are the quantities of sub-surface oil (or gas) in known reservoirs that geological and engineering analyses suggest can be produced economically for sale or use at current prices and with available technology. By contrast, “resources” represent an estimate by experts of all the remaining oil or gas that is likely to be recoverable eventually – counting on some technologies that are not fully developed and may hold little economic promise for many years (e.g., processing methane hydrates from seabeds).

The United States is by far the world's biggest gas producer and consumer. In 2000 about 30 percent of the natural gas used in this country was consumed in generating electricity – with power production being divided almost evenly between traditional utilities and non-utility generators (NUGs), whose share of the market became a majority for the first time that year.¹⁵ The rest of U.S. gas consumption is split roughly between industry¹⁶ and what the U.S. Department of Energy (DOE) tends to call “the building sector” (residential and commercial consumers combined) for space heating, water heating, and cooking. Gas must compete in this case with home heating oil, but among residential/commercial energy users it has been almost four times as important as that fuel on a national basis in recent years.¹⁷ Electric heat pump systems provide almost exactly the same amount of end-use energy for heating U.S. buildings as does natural gas, but high losses in generation and delivery mean that the electricity in this application consumes three times as much primary fuel.

More than 15 percent of the gas used in this country during 2000 originated in Canada¹⁸; and by 2000 EIA – the quasi-autonomous analytical entity within DOE – was projecting that this share would rise shortly to about 18 percent¹⁹. The next two years

¹⁵ Energy Information Administration, U.S. Department of Energy, *Monthly Energy Review*, July 2002, Tables 7.6, 7.7 and 7.8. *Monthly Energy Review* will be referred to subsequently as “MER”. Some references will be to older issues of this statistical periodical because some breakdowns (e.g., between traditional utilities and NUGs) are no longer published.

¹⁶ Some “industrial” gas also goes into “cogeneration”, which yields both electricity (for self-use or sale) and utilizable heat. It is safe to say that about 30 percent of all the gas consumed in this country is directed into producing electricity – by utilities, NUGs, or cogenerators.

¹⁷ MER, November 2003, Tables 2.2 and 2.3.

¹⁸ MER, November 2003, Tables 4.1 and 4.3.

¹⁹ U.S. Energy Information Administration, “Country Analysis Brief for Canada”, November 1999. A July 1999 study by Canada’s National Energy Board (NEB) projected that annual exports would peak within the next two decades at about 5 trillion cubic feet (tcf). The percentage share of the U.S. market this would represent depends on the level of U.S. demand at the time. MER (Table 4.1) shows it at about 22.6 tcf in 2000, and it dipped slightly in 2001 because of temporarily high prices and a sagging economy; but national gas demand is widely expected to reach 30 tcf or more by 2020.

were perhaps abnormal because of an economic downturn and fluctuations in gas prices (both of which discouraged demand for the fuel); but imports of Canadian gas did continue to rise even then – exceeding one-sixth of total U.S. consumption during 2002. The value of U.S. imports of Canadian natural gas dropped the following year, as price-induced “demand destruction” in both the industrial and generation sectors shrank total U.S. gas consumption to the level of the mid-1990s; but imports from Canada in 2003 were actually higher as a percentage of total consumption than they had been in 2000.²⁰ By 2004, EIA had done an about-face in its projection of steady growth for gas imports from Canada, suggesting that net imports would “peak at 3.7 trillion cubic feet in 2010, then decline gradually to 2.6 trillion cubic feet in 2025.”²¹ As always, however, EIA admitted that its “reference case” projections are not flat predictions and do not take into account possible policy modifications or other situational changes. (There is further discussion of this later in this chapter.)

Although new generating plants being built in the United States are almost exclusively to be fueled by natural gas, more than half of all U.S. electricity still depends on coal; and this ratio will probably continue for at least the next 20 years because the infrastructure already in place is so huge. Few new coal plants are being ordered, but many old ones are being transferred from traditional utilities to NUGs. Nuclear power has held fairly steady at about 20 percent for years; and its contribution to U.S. generation will taper off only at a slow rate, because nuclear plant operators are consolidating. Under experienced and cautious management, most nuclear power units will seek and win license renewals that will permit continued operation (at slightly higher output and high

²⁰ *MER*, May 2004, Tables 4.1, 4.3, and 4.4.

²¹ *AEO 2004*, p. 91.

capacity factors) for decades to come. Hydroelectric production is an unpredictable variable: in 2000 domestic dams were responsible for only 7.3 percent of U.S. electricity, but during the 1990s hydro output sometimes fluctuated as much as 20 percent from one year to the next because of changes in precipitation.²²

Despite persistent publicity about non-hydro renewable energy, the aggregate contribution of such sources as photovoltaics, solar-thermal, and wind will remain quite small in the overall North American energy picture. In 2000 these three together supplied far less than one-half of one percent of U.S. energy needs; and by 2003 they had still not advanced beyond that range. Geothermal energy use has decreased slightly in the past few years; and it is unlikely to expand until and unless radically new technology to utilize lower temperature differentials becomes economical. Biomass applications are problematical, but the generation of electricity from wood waste, municipal solid waste (MSW), and landfill gas cannot reasonably be counted on to fill much more of the national energy demand than these sources do now. Their modest joint contribution was essentially unchanged between 1998 and 2002.²³

This country is often accused of being an energy profligate, and in some respects that is true; but there are justifications for high energy use in all three key consuming sectors: high living standards, a large population dispersed over great distances, and the most productive industrial complex in the world.

Canada, like the United States, is a high user of energy *per capita*. This is understandable in light of its harsh climate, high degree of economic development, and

²² *MER* May 2004, Table 7.2a. During 2001, 2002, and 2003, U.S. output of hydroelectricity fell below this level as a share of total national generation (to 5.8, 6.9, and 7.2 percent, respectively).

²³ Energy Information Administration, U.S. Department of Energy, *Renewable Energy Annual 2002*, Washington, November 2003.

large geographical area in relation to total population (which is generally concentrated along the length of the U.S. border).

In 2000, Canada was the leading supplier of oil (including refined products) to the United States -- ahead of Saudi Arabia, Venezuela, and Mexico, in that order.²⁴ Canada typically sends us well over 60 percent of its crude oil production (more than 1.5 mmbd out of about 2.2 mmbd in 2003) and also provides roughly 500,000 bbl/day of refined petroleum products²⁵ – a volume that seems sure to grow in the future because of U.S. difficulties in adding to its own refining capacity. In a fascinating sidelight (which highlights the long-standing and crucial comity between our two countries, Canada also uses a pipeline that swings down from Manitoba through Minnesota, Wisconsin and Michigan to deliver about one million barrels of oil each day to southeastern Ontario.²⁶

Canada is also the world's third largest natural gas producer²⁷, and in 2000 it exported about half of all the gas it produced to this country. That was more than twice the amount it had sold us as recently as 1991, and more than three times its export volume to this country in 1977 (at the time of the failed U.S.-Mexican gas deal treated in Chapter VI, when reliance on supplies from Canadian sales was an economic factor in rejecting a higher price called for under the agreement). Despite some concerns expressed about Canada's ability and willingness to keep up the pace, its exports of gas to the United States increased in both 2001 and 2002, and picked up again in the early months

²⁴ *MER* November 2003, Table 3.3. Venezuela dropped to fourth place in 2002 and 2003, well behind Mexico. Venezuela's once highly efficient national oil company has suffered under the troubled regime of President Hugo Chavez, whose relations with the United States have been uneasy to say the least.

²⁵ *MER*, November 2003, Tables 3.3e and 11.1b.

²⁶ "Energy Picture", Canadian oil pipeline map on p. 19.

²⁷ EIA, "Country Analysis Brief for Canada", July 2003.

of 2004.²⁸ Even if imports of LNG become a significant factor in North American trade, Canada should remain this country's primary foreign supply source for natural gas.

In 2000 Canada called on hydro facilities for 61 percent of the electricity it generated. Coal was next in line, with 18 percent (an understandably significant figure, since the country is a major coal producer); and nuclear plants followed, supplying 13 percent for the year.²⁹ The ratio of output among these changes annually, however, because of uncertainties in the winter snowpack (a major source of hydro heads) and intermittent problems with nuclear plant operations. On occasion recently, this has even caused Canada to become an annual net importer of electricity from the United States; but this is also a variable. Oil-fueled generation is quite modest (about 3 percent in 2000), and "other sources" – including various "renewables" – have little significance for Canada's electricity sector. According to a 2001 market assessment by the National Energy Board (NEB), "The generation base varies by region: thermal (coal and oil) generation on the east coast; hydro in Labrador, Québec, Manitoba and B.C.; nuclear in Ontario and to a lesser extent in Québec and B.C.; and coal in Saskatchewan and Alberta."³⁰

Natural gas fueled Canadian generators in 2000 that were responsible for only 4 percent of that nation's total electricity output; but this share is projected to climb. In fact, the Canadian Energy Research Institute (CERI) estimated earlier that gas demand for

²⁸ *MER*, May 2004, Table 4.3.

²⁹ National Energy Board, *Canadian Electricity: Trends and Issues*, Calgary, May 2001, p. 3.

³⁰ *Ibid.*

electric generation could almost triple in Canada during the first 10 years of the new century.³¹ Its National Energy Board (NEB) explained why:

The natural gas share is currently small, but its advantages, such as low capital cost, high energy efficiency achievable in combined-cycle plants and relatively short approval and construction periods, have made it the preferred fuel for most new generation capacity. When making decisions on the installation of new generation, the combined-cycle natural gas plant has become a benchmark against which other projects are compared.³²

Canada's wild card for the long-term future, however, lies in what "Energy Picture" called its "vast reserves of oil sands, of which about 308 billion barrels are economically recoverable".³³ Chapter I explained that these are now being treated by industry authorities as "commensurate with conventional oil"; and approximately 175 billion barrels are now "booked" by *Oil & Gas Journal* as recoverable with today's technology, current costs, and current economic conditions.³⁴ Estimates in this range are several times what had been considered until recently the total proved conventional reserves for all of North America. Development costs range between \$9 and \$13 per barrel; and oil sands production had already reached 658,000 bbl/day in 2000, of which about 60 percent was exported to the United States in that year.

The ramifications need to be weighed in long-range energy policy planning, in respect to both environmental impacts and the energy input required for various methods of product recovery from oil sands. Uncertainty about the economic costs of controlling emissions in order to accommodate Canada's ratification of the Kyoto Protocol has led to delays in at least two major projects (TruNorth Energy's Fort Hills and CNR's Horizon);

³¹ EIA, "Country Analysis Brief for Canada", November 1999.

³² National Energy Board, *Canadian Electricity: Trends and Issues*, Calgary, May 2001, p. 3.

³³ *Energy Picture*, Section 3, p. 7.

³⁴ "Country Analysis Brief for Canada", January 2004. This most recent CAB from the Energy Information Administration cites both *O&GJ* and the Alberta Energy and Utilities Board.

but the Canadian government has tried to reduce this barrier by putting a temporary cap on the price of CO₂ credits operators might have to pay in order to proceed. There are also concerns about pollution of groundwater and extensive surface disturbance; the Alberta Ministry of Energy estimates that roughly two tons of oil sands must be dug up, moved, and processed to produce each barrel of oil by one method of extraction. Finally, great quantities of natural gas are required, to generate electricity for the giant earth moving equipment and raise steam to separate a useful product ultimately from dross. Some analysts estimate that full-blown realization of all projects proposed to date could consume up to 2 billion cubic feet per day of gas – which would be the entire throughput of a Mackenzie Delta pipeline as now envisioned.³⁵

Like conventional petroleum deposits, oil sands yield a range of products – from viscous bitumen to an “upgraded” crude oil that can be similar to light sweet crude with very low sulfur content (0.1 to 0.2 percent).³⁶ But environmental implications of massive oil-sand recovery need to be evaluated, and the upfront costs are steep – the types of policy considerations that are discussed more fully in Chapter VII (which deals with tradeoffs among desirable goals).

Mexico’s conventional oil reserves are slightly larger than those in the United States, while its gas reserves (based on exploration and development to date) are much smaller -- only about one-third the size of those in Canada.³⁷ Mexico uses significantly

³⁵ *Ibid.*

³⁶ National Energy Board (Calgary), *Canada’s Oil Sands: A Supply and Market Outlook to 2015*, October 2000, p. 25. (Note that an updated edition of this document, published in May 2004, offers more specifics about progress in reducing the requirements for inputs of natural gas while tapping oil sand reserves.)

³⁷ “Energy Picture”, p. 7, cited conventional oil reserves (in billions of barrels) as: Mexico 24, U.S. 22, and Canada 4.4; but that was prior to the reevaluation of oil sand potential described here. The same document shows the United States with 167 trillion cubic feet (Tcf) of gas reserves, more than the combined figures for Canada (92 Tcf) and Mexico (30 Tcf). These gas figures could change also whenever NAEWG releases

less energy per person than either of its regime partners; and this characteristic might persist even as economic gaps narrow. A large percentage of Mexico's population lives in moderate climates, where heating and air conditioning needs are both lower. An exception is the rapidly growing north, where air conditioning (which requires electricity, natural gas, or both) could assume intense importance for an expanding middle class.

In February 2002, a Mexican Under Secretary of Energy, Dr. Francisco Barnés de Castro, predicted that his country's requirements for natural gas would grow at an annual rate of more than 8 percent for the next decade (largely to fuel new combined-cycle generating plants) . . . and that by 2010 domestic gas production would supply only 80 percent of his nation's requirements.³⁸ By October 2003, the same official had lowered his annual growth forecast for gas demand slightly (to 7.4 percent); but he still envisioned the need for 61 new power plants by 2011, with the electricity sector accounting for 60 percent of Mexico's market for gas by that time.³⁹ Despite ambitious plans to increase domestic production, imports of U.S. natural gas have been permitted since 1996; and these are expanding along the western segment of the border – often with specific ties to newly installed electricity generating units.

In *AEO 2004*, the U.S. Energy Information Administration more than doubled the long-term projection it had made only a year earlier in *AEO 2003* for U.S. imports of LNG. It now visualized such imports increasing “from 0.2 trillion cubic feet in 2002 to

its promised outlook on North American gas, but no major modification is anticipated. By 2010, however, if the British Columbia government succeeds in rolling back a 30-year ban on exploration off the Pacific Coast, Canada's gas reserve outlook might improve sharply.

³⁸ Francisco Barnés de Castro, “Mexico's Electric Industry”, Siemens-Westinghouse Conference, Mexico City, February 18, 2002.

³⁹ Francisco Barnés de Castro, “Mexico's Energy Policy”, 23rd North American Conference of the International Association for Energy Economics, Mexico City, October 20, 2003.

4.8 trillion cubic feet in 2025.”⁴⁰ As a result, its 2004 reference case foresaw an end to growth in exports of natural gas to Mexico by 2006, after which the gas that begins entering the United States from an LNG import terminal in Baja California would be counted as imports from Mexico.

In 1999 about half of Mexico’s electricity was still coming from oil-fired generators; but the administration of President Ernesto Zedillo Ponce de Leon had already committed the nation to a general shift away from heavy oil and toward natural gas in these plants, and under President Vicente Fox Quesada the switch is continuing. In both presentations cited, Under Secretary Barnés mentioned studies indicating that Mexican demand for electricity would grow by about 70 percent in the next 10 years, but that gas demand would climb even faster – with most of the rise in gas requirements related to power generation.

Where will Mexico find that gas? Up until now, much of it has come from oil wells in the south of the country, far from population concentrations. Old gas fields in the northeast are still largely underdeveloped; and occasional modest exports to the United States continue in that area – even while annual imports by pipeline have grown from 16 billion cubic feet in 1990 to 61 bcf in 1995 and 106 bcf by 2000. By 2002, imports had risen to 263 bcf, and the numbers were up again during 2003.⁴¹ Yet Mexico’s domestic gas resources (as distinguished from proved reserves) are not insignificant. Also, they will soon be augmented by LNG arriving at new processing facilities on both the east and west coasts, although some of the regasified product will be re-exported to the United States and thus serve continental purposes within the North American gas network.

⁴⁰ *AEO 2004*, p. 8.

⁴¹ *MER*, November 2003, Table 4.3.

Huge investments will be needed to tap the potential of Mexico's Burgos Basin and some deepwater sections of the adjacent Gulf of Mexico, but arranging them has proved daunting. Pemex has not been allowed to decide for itself how to invest its own proceeds, which the federal government uses to cover approximately one-third of its entire annual budget; so the parastatal company must count on legislative appropriations for new development projects (which thus must compete with pressing short-range fiscal commitments that are totally unrelated). Private capital insists on potential rewards to match risk; but this is hard to promise while the Mexican constitution forbids sharing the fruits of drilling proportionally, and even the device of "multiservice contracts" (which would give a single private operator flexibility to coordinate all field development activities in return for a total fee to be determined by bidding) is open to challenge on both legal and practical business grounds.

Considering opportunities that qualified companies have for investment elsewhere, the prospective rate of return in Mexico that might appeal to them could be considered much too high to be acceptable to Mexicans who hark back to foreign exploitation that led to national expropriation of mineral resources more than six decades ago. The mismatch in expectations between Mexican officials and hard-headed corporate leaders from the worldwide oil industry was evident in 2003-4 when the first seven invitations to compete for multiservice contracts in the gas-rich Burgos Basin brought few bids . . . and none at all on two of the tracts offered. Pemex announced that it would reconsider the process and conditions.

As one of the preceding tables reveals, the lion's share of Mexico's own total energy use (in all forms) has been in the industrial sector; but there are a couple of

reasons to expect this consumption pattern to change: 1) Much of this energy has been used within the energy sector itself (as a tool of production) by the inefficient parastatal company Pemex; and 2) rising living standards should increase energy use in households, business operations, and office buildings, as well as in both commercial and private vehicles. Dr. Barnés projections in late 2003 for his country's 10-year demand for natural gas by sector (discreetly omitting use within Pemex) showed residential services and transport use of gas rising at an astonishing rate of more than 18 percent annually.

In 1999, Mexico was still deriving a minor fraction of its electricity from an overworked variety of old coal-fired generating units. Its domestic coal production was complemented by a relatively small amount of U.S. and Canadian coal imported by rail; and the "Energy Picture" projections suggest that net imports will triple by 2010 (from about 2 million tons to roughly 6 million tons, despite a rise of 50 percent in domestic production).⁴² Much of that increased requirement is tied to a single site near Acapulco (Petacalco), where half a dozen units were scheduled for conversion from high-sulfur oil to coal. This is an exception. Mexico also has a single, two-unit nuclear power plant; but it generated only 4 percent of the country's electricity during 2000, and this share will be diluted as new fossil-fueled plants come on line. A corresponding decrease in market share can be expected for hydro (17 percent in 2000), coal (about 10 percent in 2000, according to "Energy Picture") and geothermal (a portion of whose customary 3-percent share has gone across the border to California in recent years).

Nevertheless, projections are not prophecy; and there can be radical differences in the assumptions on which reputable authorities model prospects. To illustrate this, one

⁴² "Energy Picture", Table 1B and 2B.

need only observe the wide difference between the growth projections for Mexican energy demand by fuel-type in EIA's *International Energy Outlook 2002* and its *IEO 2003* (Tables A4 and A5 in each case). While the 2002 edition showed consumption of 4.6 million barrels per day of oil and 2.6 trillion cubic feet of natural gas by 2020 in its "reference case", *IEO 2003* projected only 3.6 mmbd of oil but 4.3 tcf of gas.⁴³

One assumption that few question is that Mexico's population growth will outstrip that of its NAFTA partners – although "Energy Picture" assumes that the annual differences between now and 2010 will not be dramatic (1.1 percent for Mexico, 1.0 percent for Canada, and 0.6 percent for the United States). The "Economic Trends" section of that document also projects Mexico's annual increase in Gross Domestic Product (GDP) as the highest in absolute terms – 4 percent, versus 2.9 for the United States and 2.5 percent for Canada, But it shows Mexico anticipating the slowest per capita economic growth of the three – only 13 percent, compared with 16 percent in Canada and 25 percent for the United States.⁴⁴ Oddly, the final section of "Energy Picture" revealed that Canada and Mexico made different assumptions about economic growth when projecting their own future energy needs. Canadian members of NAEWG used a lower annual GDP growth rate (2.3 percent), while the Mexicans used a higher one (5.2 percent).⁴⁵

⁴³ Note that EIA's switch from a "bearish" outlook overall for the role of natural gas in *IEO 2002* to a "bullish" stance in *IEO 2003* – as noted previously -- makes these reversals in *AEO 2004* subject to some skepticism.

⁴⁴ "Energy Picture", Section 2, p. 4.

⁴⁵ "Energy Picture", Section 8, p. 71.

The Special Roles of Gas and Electricity

More than half of all the electricity in the industrialized world is produced and used in North America.⁴⁶ Its use touches every segment of society and the economy; and its continuous availability is critical to the contemporary concept of “health, wealth and happiness”. Meanwhile, natural gas has become a focal point in meeting future demand for electricity -- partly because of a move (not limited to North America) to concentrate on this fuel for reasons of environmental concern and national security as well as economics. President Zedillo had an added incentive to concentrate on gas as the fuel for future electricity generation, since this would permit Mexico to maximize its exportable surplus of petroleum – a trade commodity that promised to continue attracting hard currency on the international market.

People do not desire any form of energy for itself, but for what it can provide them. Under various conditions, natural gas and electricity give them access to heat, cooling, light, mobility, productive power, the ability to communicate, and so on. Thus, requirements for either gas or electricity fluctuate with the time of day and time of year, but also with variations in weather and the patterns of work and recreation. To some extent, gas and electricity can substitute for one another; in other respects they are complementary. In any event, demand for either energy-form over time assumes graphic “peaks and valleys”. Drawing on supplies of each from a larger number of sources while demand is being spread over a larger region enhances the possibility that “peaks” and “valleys” at different geographic locations can be matched to cancel out. If this can be accomplished with a minimum of time delay and expense (and if there are not too many

⁴⁶ *IEA 2002*, Table A9.

factors interfering with direct competition among buyers and sellers), the result is potential improvement in economic and environmental efficiency:

- Incremental supplies can be provided and selected on the basis of lowest available marginal cost.
- Capital-intensive “reserve margins” for production capacity in the aggregate can be lower than would be necessary if they had to be maintained for each of multiple demand regions individually.
- Proper design of the pipeline network can reduce costly local storage facilities for natural gas.
- Using the most efficient means of electricity generation reduces the drain on ultimately limited natural resources and tends usually to cut down undesirable emissions.

All this depends, of course, on the assumption that gas and electricity are interchangeable with one another to a significant extent for both buyers and sellers . . . and that distant segments of a continental market such as North America are quickly accessible for either commodity on short notice. This has been made feasible only in recent years, by a complex of technological and regulatory developments that will be discussed in Chapter V. It was encouraged further by the rapid popularization of “energy derivatives” (such as “futures” and “options”) once gas and electricity both came to be treated widely as commodities. When all these innovations came together at once, however, it might have been predicted that opportunities for miscalculation and abuse would also arise – as occurred particularly in California during the winter of 2000-2001. This has slowed refinement of the North American gas-and-electricity market to a certain

degree, but (thanks in some measure to the built-in flexibility of the regime) the result portends to be only delay rather than disruption.

Modes of gas consumption in these three countries will doubtless change; but projections of technological progress (e.g., fuel cells and other means of “distributed generation”) suggest an increasing rather than diminishing role for the fuel. Furthermore, especially in the case of the United States, greater reliance on natural gas (which is available close at hand) reduces dependence on oil imports from the politically unstable Middle East. This helps to explain why, by 2000, oil had been cut to only 2.4 percent of primary fuel input in all U.S. electric utility generation and less than five percent for NUG output.⁴⁷

Although the total volume of oil trade among the three countries is (and may remain) greater than the exchanges of either gas or electricity, the latter two contribute more to “energy interconnectedness”. This is because of the way they interact themselves as well as the way they may flow continuously in either direction. Gas and electricity have become alternate facets of wholesale energy trade that can bind communities and regions across these borders.

Most important of all, perhaps, is one inescapable fact that must be mentioned repeatedly: North America (and even the Western Hemisphere) continues to depend on the rest of the world to satisfy a substantial part of the thirst for petroleum that must persist so long as transportation depends on it so greatly. Yet North America is essentially self-sufficient in both gas and electricity. That is a marvelous incentive to cooperate in optimizing their development, exchange, and application!

⁴⁷ *MER*, July 2002, Tables 7.3 and 7.4.

Continental “self-sufficiency” in gas has been challenged recently, especially since the widely publicized issuance in the fall of 2003 of a report by the National Petroleum Council.⁴⁸ But the conclusions of that study, as well as subsequent pronouncements by Federal Reserve Board Chairman Alan Greenspan and recent projections by the Energy Information Administration of the U.S. Department of Energy, have – in my opinion – been misinterpreted to a large extent. In all three of these sources for concern, the direst results are associated only with assumptions of policy inaction – a situation that can be avoided.

For example, the Executive Summary of the NPC study also proffers a “Balanced Future” scenario that “results in a more favorable balance between supply and demand, price projections more in line with alternate fuels, and lower prices for consumers.” As to the EIA projections, they are typically made with the assumption that policies (and, to some extent, trends) will continue unchanged. Finally, Chairman Greenspan’s sophisticated analysis was much clearer in a recent public address than it had been in his testimony introducing the topic before Congress during the summer of 2003.

Speaking before a forum in Washington arranged by the Center for Strategic & International Studies on April 27, 2004, Dr. Greenspan noted that changes already underway “bode well for widespread natural gas availability in North America in the next decade and beyond” . . . although he warned that the near term “is apt to be challenging.”⁴⁹ The pivotal factor he mentioned (which was also included in the NPC’s more comprehensive list of recommendations) was the importation of liquefied natural

⁴⁸ National Petroleum Council, *Balancing Natural Gas Policy – Fueling the Demands of a Growing Economy*, Washington, September 25, 2003.

⁴⁹ The full text of his remarks is available at the Fed’s website, www.fed.gov.

gas (LNG) in adequate volumes to exercise “price-damping” effects. There is still room for argument as to what this effective level of LNG imports would have to be, but I am not alone in my belief that it is much closer to about 5 percent of total demand during the next 15-to-20 years than it is to the figures of up to 20 percent that have been bandied about in the mass media.⁵⁰ Even if the higher estimate should prove to be correct, however, this would be far below the levels of oil import dependency that policymakers might consider acceptable from the standpoint of “energy security”. Thus it is hardly a stretch to repeat the observation that North America is essentially self-sufficient in natural gas.

Furthermore, the outlook for LNG imports implies a requirement for continued and enhanced cooperation among the three continental neighbors within a workable and mutually beneficial regime. LNG receiving facilities will exist in all three countries. The regasified product will cross both national borders – quite possibly in both directions on occasion. The gas pipeline network itself (with all its interconnections with the similarly continental patchwork of regional electric grids) will still form a circulatory system for energy that binds the three nations, their populations, and their economies together.

Degrees of Interdependence

International trade in energy commodities may take place on a government-to-government basis, at the wholesale level, or even (in what is usually the most intimate

⁵⁰ For a fuller treatment of how some statistics have been mishandled, even by “experts”, see Joseph M. Dukert, “What Do Natural Gas Numbers Show? . . . Surprise!”, U.S. Association for Energy Economics, *Dialogue*, vol. 11, No. 2 (July 2003), pp. 30-32. On June 27, 2003, Peter Behr of *The Washington Post* (p. E-3) quoted Daniel Yergin as saying that by 2020 LNG imports could be providing 10 to 20 percent of U.S. gas supplies. On the same day, *The New York Times*’ Matthew Wald quoted Yergin on p. C-2 as pegging the 2020 number at 5 percent. A few weeks earlier, a report from Yergin’s firm projected that LNG imports could reach as much as 11 percent of our annual requirements as soon as 2010 – a forecast that is generally recognized now (less than a year later) as totally unrealistic.

association) between a public or private wholesale source on one side of the border and an end-use consumer on the other. Obviously, tariffs or a variety of non-tariff barriers (NTBs) might limit the practical flow of such commerce. If they are eliminated totally, however, a single market appears regardless of borders. Price can be determined efficiently by supply and demand, although some deviations from a uniform, marketwide price will generally still appear because of transaction costs – influenced by such factors as volume, the expenses of delivery, and anticipation of future or related business opportunities. These should be considered normal aspects of competition.

Cross-border trade in gas and electricity within North America is not completely unregulated, nor is it ever likely to be. To the extent that a regime governing energy interdependence exists and is accepted, however, the major modifications to “free market prices” can be ascertained and reasonably predictable. The conditions under which they change should be “transparent” as well. Benefits of various kinds will accrue to each national trading partner, although they are unlikely to be distributed uniformly throughout the respective national economies, societies, and geographical territories. Nor are all these advantages recognized readily, because they go far beyond the common measurements of direct job creation and trade balances. Some arise from concomitant investment, faster interpenetration of new technology, reduced market risk for both producers and consumers, and the development of interlaced physical and electronic infrastructure that makes gas and electricity supplies – including “surge capacity” -- more abundant, reliable, and affordable. Furthermore, energy interdependence will almost inevitably be accompanied by some penalties, although overall in the case of Canada, the United States and Mexico the net results should clearly remain a win-win-win situation.

More will be said about the complicated workings of the regime itself in the next chapter, but some important points about price can be made here by outlining the approach Pemex (the national monopoly in production and “first-hand” sales of natural gas within Mexico) took very shortly after NAFTA came into effect.

At least since 1995, Pemex has based its own internal price accounting, as well as the “normal” price of gas it charges customers, on the market-determined price in the Houston (Texas) Ship Channel⁵¹ -- which of course fluctuates. Pemex adds an imputed cost of pipeline transport to various sites in northern Mexico where commercial sales take place – regardless of whether the gas actually came from the United States or was produced domestically. Because the overwhelming majority of the gas now consumed in Mexico originates as “associated gas” from its own fields in the south, however, the price set there at Ciudad Pemex is the calculated cost at an arbitrage point in between – subtracting what it costs Pemex to get it there. At the moment, a modest amount of gas is also piped to that arbitrage point (Los Ramones) by the old but still not fully developed gas fields in northeastern Mexico – the Burgos Basin. Burgos gas is also assigned a value consistent with the Houston Channel price of gas, adjusted for a delivery-cost differential.⁵²

The direction of flow in a natural gas pipeline is reversible, although switching is more difficult and time-consuming unless the line is designed from the start with this in mind. Thus, what we have at Los Ramones is a single location (a “hub”) which gas can

⁵¹ Interview with Ernesto Estrada, Vice President, Natural Gas Division, Pemex, Mexico, D.F., April 27, 1995. Later confirmed by numerous published sources.

⁵² As changes occur in supply sources, the location of the “true” arbitrage point has become the subject of dispute. This does not affect the substance of the conclusions expressed here: 1) that use of an arbitrage point to estimate the opportunity value of gas is economically sound, and 2) that the intersection of three pipeline sources is the logical site of a useful market hub.

enter or exit from (or in) three directions. With three separate sources (and, theoretically, three distinct sets of customers), movement into or out of this “balancing point” can be determined by the forces of supply and demand.

A pair of economists from Rice University and Mexico City (Brito and Rosellón) has outlined how this works, and their research suggests that the system is economically efficient.⁵³ They determined, in fact, that the netback system sanctioned by *Comisión Reguladora de Energía* (CRE) as part of a 1996 directive is a particularized application of the Little-Mirrlees Rule⁵⁴. That system proposed “using the world prices for traded goods, not necessarily because these prices are more rational, but rather because these prices reflect the terms under which a country can trade.”⁵⁵

Brito and Rosellón went on to point out that it would not have been practical for Pemex to price its gas on the basis of production costs because so much of the domestic fuel is associated with primary oil – making it difficult to divide costs between the two outputs. A second alternative might have been to peg gas prices to some substitute (such as a selected grade of refined petroleum); but this would have involved circular reasoning, since those products have been priced traditionally in Mexico according to political decisions rather than either production cost or a free market. Instead, the two authors explained that “the price of gas in Houston is a measure of the opportunity cost to Mexico of consuming the gas rather than exporting it to the United States.”⁵⁶

⁵³ Dagobert L. Brito and Juan Rosellón, “Pricing Natural Gas in Mexico: An Application of the Little-Mirrlees Rule”, *The Energy Journal*, vol. 23, number 3, 2002, pp. 81-93.

⁵⁴ I.M.D. Little and J.A. Mirrlees, *Manual of Industrial Project Analysis in Developing Countries*, Development Centre of the Organization for Economic Cooperation and Development, Paris, 1968.

⁵⁵ Brito and Rosellón, p. 82.

⁵⁶ Brito and Rosellón, p. 82.

Although I am indebted to Brito and Rosellón for their insightful economic analysis of an important factor in U.S.-Mexican gas interdependence to which I had alluded in an earlier work⁵⁷, I am taking here more of a political-economy point of view . . . and thus presume to demur from their added conclusion that “the price of gas in Mexico is insensitive to changes in the demand for gas in Mexico.”⁵⁸ My purpose is to make it clear that the pursuit of North American energy interdependence benefits Mexico without yielding flexibility in domestic energy policy. Pemex and/or other arms of the Mexican government may (and do) stabilize and/or subsidize the cost of gas to certain categories of end user. This may affect levels of consumption; but, since a small yet steadily increasing portion of that gas must be bought from outside the country, the free-market value of imported gas factors ultimately into the decision by Pemex whether and when to supplement its own production. Furthermore, the price paid for U.S. gas (or, eventually, some LNG) by a private consumer such as an independent power producer is set by negotiation, contract, or spot purchase.

Los Ramones itself is not a center of gas production, although it seems like a logical place to locate gas-storage facilities – which are inadequate in Mexico, and under rules prevailing for close to a decade can be built, owned, and operated by private (even foreign) investors. The site derives its special situation from being at the junction of the three major legs of Mexico’s existing gas trunkline system; and in this respect it calls to mind the prospects for Leidy (in central Pennsylvania) – referred to later in this chapter. Another analogy might be drawn with effective gas and electricity networks that have

⁵⁷ Joseph M. Dukert, *The Evolution of the North American Energy Market*, Center for Strategic and International Studies, Policy Papers on the Americas, Vo. X, Study 6, p. 14.

⁵⁸ Brito and Rosellón, p. 82.

begun to develop on Canada's side of its border with the United States. For example, one significant domestic result of Canada's increasing integration into a continental system of energy cooperation has been the speedup of hydrocarbon and electricity production in the Maritime provinces of its Atlantic coast – which heretofore had been largely backwaters. Growing links with New England are setting the stage for a network of energy exchange that is partly east-west and partly north-south, depending on the fluctuations of supply and demand across a broad region.

In the case of Mexico it is important to note that there are pipeline connections between Los Ramones and border-crossings both to the northwest (at Juarez) and to the northeast (at Reynosa). Ultimately, this setup links major consumers and producers of this energy source in Mexico with those in the United States. Thus, if Mexico manages to finance sophisticated development of its own domestic resources while also installing supplementary LNG facilities, it could still fulfill the projections of *International Energy Outlook 1993* by becoming again a net exporter of natural gas to the United States.

Under such circumstances, Pemex use of the Houston ship channel price (plus appropriate transportation “adders”) would still make that national company and its customers – in the words of Brito and Rosellón) “price takers”. That might irritate the sensibilities of Mexican nationalists if one did not press the analysis further. In the longer run, the equilibrating factors in gas prices within this regional marketing complex will be: 1) Mexican demand for gas; and 2) the volume of Mexico's gas imports and exports. Both are quite likely to grow. By connecting itself to a working natural gas market that includes both the United States and Canada, however, Pemex can take advantage of marginal-price gas at the U.S. border. It can also adjust its own gas production and trade

to the “opportunity cost” at such critical locations as Mexico City, Puebla, Monterrey, and even its rapidly expanding border cities in the north.

Keohane and Nye distinguished between two dimensions of interdependence, which they identified as “sensitivity” and “vulnerability”. The latter term has often been used as well by energy economists and policy analysts in this country, although not with precisely the same connotation.⁵⁹ The Keohane-Nye explanation is that sensitivity measures the speed and extent to which social, political, and economic conditions react to changes in an interdependent partner within the international framework that has been established. Vulnerability, they said, is a longer-lasting gauge – because it is based on costs induced by the external change that an actor must endure, even if policies are adjusted to counteract undesired effects.⁶⁰

Energy interdependence tends to make the related sensitivities large and almost instantaneous, because its hallmarks are market transparency and the lowering of barriers to competition. Both of these reduce what one might call “insulation through isolation”, similar to the illusory protection a country might achieve from “external shocks” by maintaining a closed economy. But in the case of energy interdependence sensitivity is more likely than not to be beneficial in the medium term rather than harmful. At the same

⁵⁹The term “oil vulnerability” has been used in distinction to “dependence on oil imports” to suggest the speed and degree with which the United States could respond to a sudden cutoff in oil imports -- through such measures as drawdowns from the Strategic Petroleum Reserve, short-term fuel-switching, emergency conservation steps, life-extensions of marginally producing wells, and augmented imports from foreign sources that are still available. Dr. Mark Rodekohr, of the Energy Information Administration of the Department of Energy, even developed a “vulnerability index” to estimate the effects of such short-term policy devices – with a low VI indicating greater “energy security” for the nation. Although U.S. oil imports in 2003-4 were about at an all-time high, the nation’s vulnerability according to this gauge was probably well below what it was at the time of the two “Oil Crises” in the 1970s. This is due to many factors, but not the least of these is the end of a “command and control” approach to energy prices and fuel allocation – which had stifled self-adjustments by the markets.

⁶⁰ Keohane and Nye, pp. 10-13.

time, vulnerabilities to injury are reduced by energy interdependence, because interconnectedness itself expands the opportunities for fairly rapid and (mutually) satisfactory adjustments. Once physical links are established and cooperative patterns begin, it is their possible disruption (rather than their operation) that most clearly threatens exposure to injury.

Energy interdependence between and among nations means more than just expanded energy trade. Thanks to: 1) the convergence of the gas and electricity industries; 2) the freeing up of prices and deliverability; and 3) the possibilities of electronic markets, the very patterns of energy trade have been modified. As a result, net imports or exports for interdependent countries have become less meaningful than the total volume of imports and exports combined.

North America is a lucid example of why the trade balance in gas and electricity has lost significance under the new paradigm for energy. The net figure for exchanges of electricity between Canada and the United States may actually change direction from one year to the next, and it almost always varies with the time of year. Across the southern U.S. border there has developed a generally counterclockwise movement in gas – with that fuel flowing southward along the western part of the border, but northward near the Gulf of Mexico to the east. By contrast, flows of electricity between the United States and Mexico have been clockwise: Power from geothermal fields and some new gas-fueled facilities in Baja California goes north, while movement across the Texas border thus far has usually been to the south.

Unlike “one-way” energy dependence (which nations have generally resisted), energy interdependence offers clear mutual advantages – because of economic

efficiencies in the application of natural resources without exploitation of any participant. Thanks to the establishment of a slowly but steadily expanding, unified market that now overlaps these three countries, a utility -- or an independent power producer (IPP), or even a large industrial customer – anywhere in the United States can buy natural gas from anywhere in Canada at a price related directly to marginal costs. Add-ons to the final price now are limited also by competition in transport and storage. Simultaneously, Mexico now has a short-term opportunity to improve the quality-of-life of its citizens (especially in the north) and a long-term chance of developing natural gas as a large-scale export commodity that could eventually replace oil in this role while enhancing the Mexican manufacturing base.

Status of Trans-Border Links for Gas and Electricity

In recent years, natural gas pipelines and transmission lines for electricity have proliferated across both the northern and southern borders of the United States. Dozens of major new energy interconnection projects were inaugurated among the three countries of North America during the 1990s, and some represent innovative arrangements that could hardly have been anticipated in the 1980s.

Time-varying demand for either gas or electricity provides great possibilities for trans-border exchanges; and at times the respective requirements for these two energy forms may even be complementary. The ability to respond rapidly as opportunities arise offers mutual benefits to all three NAFTA partners in: 1) economic growth, 2) energy efficiency, 3) security, 4) reliability, and 5) environmental protection.

Nevertheless, as recently as 1985, Jonathan P. Stern began his comprehensive and careful book examining international gas trade in North America with the sobering reflection that such trade then “was at its lowest level for more than a decade.”⁶¹ Stern was optimistic that relaxation of rigid government controls and fresh recognition of future possibilities might push trade volume to somewhere around 2 trillion cubic feet (tcf) annually by 1995 – roughly double the peaks that had been reached during the “energy crises” of 1973 and 1979.⁶² Yet he cautioned that anything beyond that could be limited by total pipeline capacity, and he warned that the capital-intensive expansion of gas pipeline systems might be hindered by political and price uncertainties in respect to the U.S. core-market. In his opinion, what was needed to realize the “enormous potential which exists for North American gas trade” was for the United States and its trading partners “to establish a stable contractual environment and an atmosphere of mutual trust for enforcing contractual conditions over long periods . . .”⁶³ In other words, although Stern never used the term, he was suggesting a “regime” that would reduce uncertainty and build confidence.

In fact, the timely addition of pipeline capacity and the encouragement given by the sweeping energy chapter of the U.S.-Canadian Free Trade Agreement saw gas trade across the northern U.S. border exceed 2 tcf by 1992 and rise steadily each year thereafter – reaching 3.8 by 2002.⁶⁴ Mexico’s return to active gas trade came about the start of the 1990s and multiplied rather quickly, although on a much smaller scale (finally surpassing

⁶¹ Jonathan P. Stern, *Natural Gas Trade in North America and Asia*, Gower, Aldershot, 1985, p. xi.

⁶² *Ibid.*

⁶³ Stern, p. 138.

⁶⁴ *MER*, May 2004, Table 4.3.

0.3 tcf in 2003).⁶⁵ It had a different set of motivations; Mexico had felt forced to become (for a few years at least) a net gas importer for reasons described above.

Were these and subsequent new pipeline connections a cause or an effect of the trilateral regime that was starting to come into being? The answer is: Both! And there were some parallels in electricity trade, although statistics of percentage growth there were less impressive. Anticipating the discussion of causality in Chapter V, it should be observed here that industry restructuring and regulatory reform in all three countries have taken place more slowly with electricity than with natural gas.

International electricity trade has been carried on in North America for about a century, involving Canada as early as 1901 and Mexico starting in 1905. But it long tended to be localized and jerry-rigged, in keeping with the pattern of power distribution services. Low voltage interconnections were adequate to provide electricity to specific communities along the U.S.-Mexican border. By contrast, long-term guarantees to accept power on the U.S. side of the border helped to finance hydroelectric facilities in Canada.⁶⁶

Only in 1977, with the completion of the Pacific Northwest-Pacific Southwest Intertie⁶⁷ did it even become technically feasible for electricity supplies from all three countries to be “blended” in satisfying the needs of a single North American consumer. It was about that time that the volume of electricity trade between Canada and the United States climbed dramatically; and it has not changed much since then – ranging from

⁶⁵ *Ibid.*

⁶⁶ EIA, *U.S. Electricity Trade with Canada and Mexico*, Washington, January 1992, p. vii.

⁶⁷ For a concise but insightful explanation of how the Intertie was originally designed to work (and the sorts of concessions Canadian utilities were willing to make in return for access to it), see *U.S. Electricity Trade with Canada and Mexico*, pp. 17-19.

about 50 to 60 billion kilowatt hours annually.⁶⁸ What has changed with some regularity is the pattern of net imports and exports at the provincial level. Canadian provinces have traditionally been quite independent of one another (and of the federal government) in their development and application of electricity facilities; and they have long been open to economic opportunities beyond the international border. Although Canada's National Energy Board has noted (perhaps with an apprehensive eye on domestic nationalists) that electricity exports "have been relatively stable in recent years, accounting for generally less than nine percent of total Canadian generation", it admits (on the preceding page of the same report) that "Interprovincial electricity flows account for" (only) "about 10 percent of total Canadian electricity consumption".⁶⁹

U.S.-Canadian cooperation in this realm has not been exclusively governmental. It has involved full participation by both private and public enterprises in the North American Electricity Reliability Council (NERC) – which embraces Canadian provinces and all of the Lower 48 United States. In recent years there has also been more and more contact with Mexico's *Comisión Federal de Electricidad*.

Electricity trade between the United States and Mexico grew slowly until the early 1980s, when expansion of border communities in the latter country was spurred by newly encouraged *maquiladora* enterprises. Although the *Comisión Federal de Electricidad* had been established in 1937 to provide electricity to areas not being supplied by private utilities, it was not until 1960 that CFE started to purchase those utilities and thus establish the monopoly it shares nationally with *Luz y Fuerza Centro*

⁶⁸ U.S. *Electricity Trade with Canada and Mexico*, p. 1; NEB, *Canadian Electricity: Trends and Issues*, p. 5; and "Country Analysis Brief for Canada", July 2003..

⁶⁹ NEB, *Canadian Electricity: Trends and Issues*, pp. 5 and 4.

(the government entity that limits its service to the area around the Federal District, including the capital city). And it was only a couple of decades later that CFE extended its national network to reach the border areas.⁷⁰ Even then, Baja California in the west remained isolated from the CFE net, just as it is still unconnected to the main Pemex gas pipeline system. Mexico now allows foreign companies to build and operate both pipelines and power plants within its borders; but U.S. companies have not been alone in entering this new market (e.g., Spain is a serious player).

By the mid-1990s the capacity of older pipelines designed specifically to bring natural gas from Mexico into the United States had barely changed since the 1980s; but by the end of the decade the capacity of export pipelines along the southern U.S. border had tripled and other systems were in the works. From the Burgos Basin, relatively short new pipelines can reach either the gas grid in this country or the domestic network that supplies Monterrey; and the recent tendency along the eastern portion of the U.S.-Mexican border has been to seek regulatory authorization for pipelines that are envisioned from the start as bi-directional.

“Energy Picture” reported that as of mid-2001 Pemex had eight connection stations along the U.S.-Mexican border where natural gas could be imported or exported, while others (in the northwest) were privately owned and operated.⁷¹ Half of the Pemex connections are close to the Burgos fields and the thriving Monterrey area; and these alone have a combined capacity of about 1.2 billion cubic feet per day – theoretically, more than 430 bcf per year. The others (installed to provide natural gas for both direct

⁷⁰ *U.S. Electricity Trade with Canada and Mexico*, pp. 4 and vii.

⁷¹ *Energy Picture*, p. 27. EIA’s *CAB* for Mexico in February 2003 said there were nine Pemex border connections.

residential-commercial or industrial use and for electricity generation) form a natural extension of the U.S. pipeline system that emanates from producing areas in Texas and Louisiana to serve customers throughout much of the country.⁷² This is significant, since the Henry Hub in Louisiana is a common benchmark for the gas derivatives markets and also for calculating prices on the spot market for many “gas market centers” in Canada and various “trading points” that increasingly make use of auction prices rather than long-term contracts.⁷³

In several cases, the primary purpose of new gas pipelines has been to deliver U.S. natural gas to new, independently operated generating plants in Mexico. The lines also make additional gas available (via Pemex) to local gas distribution systems, which are themselves owned and operated independently (under franchise) to wholesale and retail customers in northern Mexico; but the tie between the need for natural gas and the push to make more electricity (and a higher standard of living) available to the country’s burgeoning population is unmistakable.

In 2000 Canada-U.S. gas traffic was more than 30 times as great as that across the U.S.-Mexican border. Our northern neighbor now supplies about one-sixth of all U.S. gas consumption, having almost doubled its export volume between 1990 and 1995 and bumped that up by almost another 35 percent during the first seven years after NAFTA came into effect.⁷⁴ Five major pipelines to conduct this trade were completed during the last few years of the 20th century; and the 1857-mile Alliance Pipeline – the longest ever built in North America – went into service on December 1, 2000. By itself, it can bring

⁷² *Energy Picture*, pp. 26-28.

⁷³ *Energy Picture*, p. 26

⁷⁴ EIA, *Monthly Energy Review*, November 2003, Table 4.3.

1.4 bcf/d of natural gas all the way from British Columbia to the Chicago area. Before a discouraging series of events that will be discussed more fully in Chapter IV,⁷⁵ new links were planned to forward more than half that amount through Ohio to central Pennsylvania . . . and eventually (via another connector beyond) to deliver gas from Western Canada all the way to New York City. I believe personally that those plans will be realized in time.

A year before Alliance began operating, the Maritimes & Northeast Pipeline (M&N) was placed in service. It delivers gas from the Sable Offshore Energy Project to what used to be the northeasternmost terminus of the U.S. supply network in Massachusetts. A map on page 31 of Stern's book had shown such a route as "planned" 14 years earlier; and this suggests that things sometimes take a while to fall into place. Nevertheless, this is a development whose effects will be felt profoundly for a long time to come. This marked the first time markets in either New England or Atlantic Canada had access to significant volumes of natural gas from a nearby source; and the fuel is expected to become very competitive with coal and oil for generating electricity in Nova Scotia and New Brunswick.⁷⁶

For the time being, trans-border pipeline capacity appears adequate to handle current traffic and near-term growth. EIA has reported that "From 1990 to 2002, U.S. natural gas pipeline import capacity grew by 128 percent while U.S. export capacity grew by more than 300 percent."⁷⁷ In percentage terms, the greatest increase was across the U.S.-Mexican border – where pipeline capacity jumped sevenfold during this period. The

⁷⁵ See section entitled "What Happened in 2000?"

⁷⁶ EIA, "Country Analysis Brief for Canada", November 1999.

⁷⁷ EIA, *Expansion and Change on the U.S. Natural Gas Pipeline Network – 2002*, May 2003, p. 15.

only major project completed in that area during 2002 was the North Baja Pipeline, which traverses only 80 miles in the United States before crossing the border to deliver fuel to generating plants in Baja California, Mexico.⁷⁸ Meanwhile, a combination of environmental disputes, falloff in demand, and some disappointments in drilling results off Nova Scotia brought about postponements of several projects. Public and industry interest turned also to numerous proposals for LNG receiving facilities in all three countries, based on lower costs being projected for liquefaction and transport of the fuel in super-refrigerated form.

Nevertheless, plans for pipeline extension and expansion continue. Early in 2001 the U.S. Federal Energy Regulatory Commission gave final approval for a couple of important interconnections that could tie the Maritimes Pipeline into a longer Stateside line to service more of New England. Another new route (called Northwinds) is still seeking firm market support, but it is intended to bring Western Canadian gas to an import site near Buffalo and then transport it to Leidy in Central Pennsylvania.⁷⁹ That would make Leidy a potential hub for gas coming from three distinct sources – Maritime Canada, Canada’s original rich Western Sedimentary Basin, and the U.S. Gulf Coast. Leidy is an enlarged analog to Los Ramones in northeastern Mexico (see above). Competitive sources of energy make for efficient pricing and reliable, adequate supplies; and the evolving system of network-and-hubs promises to enhance such competition.⁸⁰

⁷⁸ *Ibid.*, p. 1.

⁷⁹ Thomas M. Kiley, President, Northeast Gas Association, “Outlook on Natural Gas Supply and Deliverability in the Northeast,” presentation to Massachusetts Electric Restructuring Roundtable, Boston, June 13, 2003, and personal e-mail from Julie Coppola Cox of National Fuel, January 27, 2004.

⁸⁰ In December 2003, part of this effort stalled when U.S. Secretary of Commerce Donald Evans upheld a New York state ruling that blocks the line from crossing the Hudson River at the chosen point. Evans’ 39-page decision proposed that the crossing take place at some less environmentally sensitive spot to the north;

One pipeline connecting the United States and Canada is even intended to cross the border under Lake Erie; and the expanding availability of infrastructure alone would seem to invite our gas imports from Canada to keep on growing. Meanwhile, a much smaller but increasing amount of gas heads into Canada from this side. The annual figure roughly doubled between 1999 and 2000, and again between 2000 and 2001. U.S. exports to Canada pale in significance compared with imports, however, amounting to only 189 billion cubic feet in 2002 and 294 bcf in 2003.⁸¹

As of mid-2004, one heard varying opinions as to whether U.S.-Canadian gas trade would continue to increase, level off, or even decline. EIA's *Annual Energy Outlook 2002* projected that U.S. imports from Canada would rise from just over 3.5 to 5.3 trillion cubic feet annually during the first 20 years of this century;⁸² but the most recent edition of *AEO* takes a startlingly different view. It shows net imports peaking at 3.7 tcf in 2010 and then dropping off to 2.6 tcf by 2025. LNG from a number of countries combined is seen surpassing Canadian gas as a single supply source by 2015.⁸³

EIA defends this radical shift in its latest projections with a four-page "Reassessment of Liquefied Natural Gas Supply Potential" (*AEO 2004*, pp. 39-42) and two additional sections reassessing Canadian natural gas supply potential in light of the large amounts of natural gas that might be diverted from end-use to that country's processing of oil sands (pp. 43-45). Yet *AEO 2004* hedges its bet in the end by presenting two different cases, which would result in strikingly different projections of gas

but Columbia Gas Transmission Corporation argued that relocation would add too much to the project's cost, and the outcome was still up in the air as this was written.

⁸¹ *MER*, May 2004, Table 4.3.

⁸² *AEO 2002*, p. 6.

⁸³ *AEO 2004*, p. 91.

consumption for that purpose. It says the level might be “as high as 1.3 trillion cubic feet per year or as low as zero.”⁸⁴

Gas trade within North America has long been complemented to some extent by U.S. importation of liquefied natural gas from other continents; but through 2003 the total was only equal to about what this country exports to its two NAFTA partners. Thus far, LNG has served similar, relatively modest, regional purposes within the huge North American market. Mexico seems ready to go ahead with the establishment of LNG facilities in Baja California (with four active proposals there to serve both Mexican and U.S. markets, as of December 1, 2003); but, if and when this occurs, part of the imported fuel will wind up in California – which could mean an actual increase in the use of trans-border pipelines, rather than a displacement. Two other terminals proposed for Canada would likewise be directed in part to filling some U.S. requirements.

Furthermore, there are several reasons why the portrayal of a rush to LNG by EIA and some others is likely to have been exaggerated: 1) The permitting process is still complicated, and most of the more than 30 “announced” projects for North America will be dropped one-by-one, as soon as a venture competing for the same segment of customers is approved. 2) *AEO 2004* admits that there could be “changing circumstances in the U.S. natural gas market” as well as “delays in financing” or “changing political conditions or government policies, either in the United States or abroad.”⁸⁵ 3) If it really begins to appear that the United States and its North American partners might face a new “vulnerability” because of extreme reliance on natural gas supplies from overseas,

⁸⁴ *AEO 2004*, p. 45.

⁸⁵ *AEO 2004*, p. 40.

security arguments against this would surely come into play. Some additional LNG will be salutary, but policymakers should not mistake it for a panacea.

In summary, it will be up to the regime to gauge the relative significance of LNG versus continental gas (even if the latter leads to easing some current restrictions against drilling and pipeline construction). The national energy interests of all three countries are involved; and a balance will have to be struck. This is why the flexibility of the regime – its ability to change in response to either internal or external circumstances – is crucial.

Next, let's turn back to electricity:

As noted above, extensive power links across the U.S. Canadian border have developed over a long period, resulting from the fact that some provinces have chosen to exchange more electricity with the States annually than they do with other provinces. Canadian utilities had been selling wholesale power at the border to U.S. utilities for a long time; but within recent years power suppliers in several provinces (Alberta, British Columbia, Quebec, and Newfoundland) have received permission to make sales directly to wholesale customers in this country. At the same time, a province such as Alberta now enjoys the option of selling either electricity or its generating fuel (depending on supply and demand in any given time frame); and this means that more fluctuations in the mix of international energy trade will be based on market conditions.

With both countries sensitized by threats from terrorism and the annoyance of the 2003 blackout, the framework of the new regime could well invigorate fresh construction of transmission lines as well as new habits of operation. Modifications will take place in locations and to the extent that markets suggest, NERC encourages, and various levels of

governmental regulation permit. Improved reliability probably requires smoother connections between provinces and among states in addition to binational cooperation.

The “big picture” is intricate. Vermont is joined by power lines with Quebec, and Maine with New Brunswick. New York links up with both Quebec and Ontario. Michigan has interconnections with Ontario too, and Manitoba shares electricity with Minnesota. And so on. Saskatchewan’s electricity requirements are supported by purchases and sales with the neighboring provinces of Alberta and Manitoba . . . but also with North Dakota. Additional transmission capacity is planned currently between Alberta and Saskatchewan, as well as between Canada’s two provincial giants – Ontario and Quebec.

All are interested in firming up plans for Regional Transmission Organizations (RTOs) that can maximize effectiveness of the networks by straddling the international border. Although much will depend on individual provincial decisions, those plans still await new designs by the Federal Energy Regulatory Commission (which has jurisdiction only over the U.S. side), and comprehensive Federal legislation that could give FERC authority to enforce decisions reached voluntarily by NERC (which includes representation from both sides of the border).

Canadian leaders (including both government officials in successive energy ministries and spokespersons for the electricity industry) seem to be at ease over some such cross-border jurisdiction. In a recent seminar on “Canadian Energy Potential” sponsored by the Canadian Embassy in Washington, the Canadian Electricity Association released a report with seven recommendations for all “stakeholders”. Not only did it call for bi-national cooperation in the construction of new transmission capacity, coordination

of protection for critical infrastructure, and harmonization of efforts to streamline regulation of electricity markets. While supporting a U.S. legislative proposal to let FERC enforce voluntarily adopted reliability standards, it also specifically endorsed “a self-governing international organization for developing and enforcing mandatory reliability standards for the evolving electricity industry.”⁸⁶ Mechanisms for achieving enforcement in Canada (perhaps at both national and provincial levels) would have to be worked out, but the will to do so is obviously present.

Ontario was a net importer of power from the United States in 1999,⁸⁷ but a net exporter by the following year.⁸⁸ Alberta was a net importer from the U.S. in both 1999 and 2000, mainly via BC Hydro’s system.⁸⁹ In 2000, Alberta was also a net importer of power from British Columbia (although there are regular flows back and forth); and NEB’s illustration in this case deserves full quotation:

B.C.’s hydro resources provide an advantage in trade. Because of the relatively low cost of increasing output from hydro facilities, the hydro facilities can meet peak demands at lower costs than thermal systems, such as Alberta’s coal and gas-fired facilities. On a daily cycle, B.C. can export electricity to Alberta during peak hours, such as in the late afternoon to early evening, and then Alberta utilities can return power to B.C. in the off-peak period, later at night. Prices in the peak period tend to be higher; however, Alberta’s requirement for peak-load facilities is reduced.⁹⁰

The picture to the south is somewhat different, partly because of Mexico’s lingering tradition of parastatal operation, which requires relatively convoluted arrangements. In some cases, instead of going through the Mexican state electricity

⁸⁶ Canadian Electricity Association, *Canadian Electricity and the Economy: The Integrated North American Electricity Market – A Bi-National Model for Securing a Reliable Supply of Electricity*, March 2004, p. 1 and p. 11.

⁸⁷ *Energy Picture*, p. 32

⁸⁸ NEB, *Canadian Electricity: Trends and Issues*, p. 35.

⁸⁹ *Energy Picture*, p. 32, and NEB, *Canadian Electricity: Trends and Issues*, p. 16 and p. 22.

⁹⁰ NEB, *Canadian Electricity: Trends and Issues*, p. 16.

monopoly, new power plants there essentially have been selling “shares” in their “surplus” output to industrial operations nearby – effectively making them direct customers. And in August 2000 CRE opened a new era. The regulatory body approved a construction permit for an IPP plant in Baja California that intended to devote nearly 300 MW of its generating capacity to producing electricity for export to its owners in California

One U.S. governmental review process has been going on for years. It is for a massive interconnection between Arizona and the Mexican state of Sonora, but its status is delicate. Environmental objections were raised to the easiest routes, and this gave a competing consortium time to file its own application for regulatory approvals. The special significance is that the companies originally planning this 300-mile, 365,000-volt system of powerlines announced their long-term intention to supply electricity along it in either direction as requirements dictate. Assuming that it is built eventually, it will connect the switchyard at the Palo Verde Nuclear Plant west of Phoenix (part of a network that serves a dozen western States and is linked to British Columbia and Alberta) with a substation 60 miles south of the border in Sonora. Much of its route could parallel a gas pipeline, and the Public Service Company of New Mexico has explored the idea of also using the power transmission lines to carry fiber optic cable as a high-speed, broadband communication link.

Future projects to improve physical connections for exchanges of gas and electricity among the NAFTA partners will almost always be influenced by technical, economic, environmental, and political factors (including challenges to the constitutionality of some arrangements sanctioned by the current Mexican administration

and its predecessor). Nevertheless, “Energy Picture” described considerable momentum as of 2001:

Canadian members of NAEWG mentioned plans to expand hydropower generation in Quebec and Newfoundland,⁹¹ with the clear implication that a major segment of this increased capacity could be available for export. Maps submitted by Mexican members for inclusion in the original “Energy Picture” document show more than half a dozen “possible” new electric power connections with California, Arizona, New Mexico and Texas – along with numerous east-west lines and substations south of the border that might provide the necessary “depth” to absorb heavy infusions of electricity from the U.S. side without threatening system reliability.⁹² CFE recognizes that Mexico’s national grid needs substantial improvement; and it has undertaken projects (working with private companies) to install hundreds of miles of new high-voltage transmission lines domestically within the next few years.⁹³

Delays may occur for a variety of reasons. For instance, the Northwinds pipeline mentioned above was first announced less than a week before the September 11, 2001, terrorist attack on the World Trade Center and the Pentagon – which combined with other developments to upset the North American economy and change projections of economic growth. Shortly thereafter, the project sponsors admitted quietly that its original target date would slip by at least a year. The company’s marketing survey still showed “genuine

⁹¹ *Energy Picture*, p. 32

⁹² *Energy Picture*, p. 39-41.

⁹³ EIA, “Country Analysis Brief for Mexico”, February 2003.

interest” among fuel purchasers, but found that “prospective customers were not willing to commit to the project in a time frame to allow a 2004 startup.”⁹⁴

Another complicating factor has been turmoil in the energy industry as a result of management and accounting improprieties epitomized by “the Enron scandal”. One company after another has been forced to restate earnings and/or defend itself against charges of market manipulation. The result has been a selloff of assets and a reversal in some cases of the convergence trend among entities that produce, deliver, and handle trades of energy. In addition, all this has further confused the continuing debates in legislatures of all three countries about modifications to the groundrules of newly deregulated or reregulated energy markets.

Simple resistance to change should be recognized as one more barrier to perfecting the North American market system. State and provincial officials are unhappy at the prospect of losing tight control over exactly how energy will be produced, distributed and priced. Some environmentalists react instinctively in opposition to any new installation to produce or distribute energy in any form. Such roadblocks can be overcome satisfactorily. That is one of the functions of the regime.

The existence of an international regime does not guarantee that the “best” course of action will always result. A regime establishes a reasonable, workable framework for decision-making. The resultant path for its nation-members might not inevitably be successful . . . or wise . . . or, indeed, “fair”⁹⁵. If an issue-area regime is as complex as

⁹⁴ Personal e-mail from Les Cherwenuk of TransCanada, January 14, 2002.

⁹⁵ Doran devoted the very first chapter of his “Oil Myths” book to discussion of whether there is any absolute definition of the “fair price for a barrel of oil.” His conclusion seemed to be that there cannot be. The same can be said about an mcf of gas or a kwh of electricity – especially when various externalities are considered.

this one, its movement may not even be easily predictable. Nevertheless, its continuation seems reasonably assured on the basis of the facts of the matter described in this status report on the North American energy market. Its tendency to date toward energy interdependence appears to be in the national interest of each participant nation. Its inherent ability to respond to sub-national power structures as well as to changes in the global situation (as outlined in subsequent chapters) protect its integrity.

Some Technical Considerations

Ideally, energy interdependence would mean that both gas and electricity could move from suppliers to consumers in whatever constituted the most efficient pattern at any given time. It is not quite that simple in real life; and the technical complexities point up the value of an energy regime that is now capable of encouraging cooperative planning.

For instance, when a certain volume of electricity is directed to move from Point A to Point B in a network, it follows the path of least resistance – which often is not a straight line. The complex interconnections almost invariably offer many possible paths; and -- depending on how congested the lines are – it is not at all unusual for electrons to “loop” across state and even national boundaries (through Points C, D, E, etc.) before reaching their final intended destination. This is not a flaw, but an advantage of the network system – which ensures that transmission capacity is utilized efficiently. However, these characteristics make it more difficult to lay out networks and plan cooperation. They make monitoring of flow a sensitive task . . . and measurement of flow especially tricky. Yet real-time monitoring is essential to avoid overloading the wires;

and measurement becomes doubly important when separate payments might be owed – one for the volume of electricity being transmitted and another for the use of the wires to carry it (which might be in different states or even different countries). One indication of this is that U.S. and Canadian import-export statistics invariably differ slightly, since one is based on contractual deliveries of electricity and the other measures the usage of border-crossing transmission lines.

The direction of electricity in high-voltage transmission lines sometimes needs to be reversed, and this is a relatively simple procedure. Flow can be switched in gas pipelines too, although the time and expense are not trivial. When it comes to moving electricity across the boundaries of any two distinct, alternating-current operating systems, however, the problems become much more complicated – and expensive in “up-front costs” to resolve.

There are two basic modes of transmitting electricity – 1) alternating current (ac) and 2) direct current (dc). The first type of system “pulses” electrons along a cable, customarily *alternating* their direction 60 times each second (although some countries use “50-cycle” ac). The second delivers electrons in a steady, *direct* stream. A common source of direct current is a chemical battery, such as is used in motor vehicles. Nearly all stationary equipment in the three NAFTA countries, however, ordinarily uses 60-cycle alternating current; and this is what is produced by turbine generators⁹⁶, regardless of whether a gas moving across their blades has been heated by coal, oil, natural gas, nuclear reactions, geothermal energy, biomass, or some exotic fuel.

⁹⁶ Photovoltaic systems produce dc; and the same is true of fuel cells. Because wind turbines turn at varying speeds, the electricity they produce must also be converted into standard 60-cycle current before it can enter a network or operate most equipment.

Alternating current inevitably suffers “line losses” if it is transmitted any appreciable distance. Typically, only around 90 percent of the electricity fed into a grid reaches the point where it is to be used; and when massive quantities of power are involved this represents a considerable penalty. Direct-current transmission reduces this problem (and might practically eliminate it if affordable “superconducting” systems are ever devised to operate at reasonable temperatures instead of near absolute zero); but switching large volumes of dc back-and-forth with ac requires bulky and very expensive installations. In some situations, this is economically feasible.⁹⁷ The Pacific Intertie is the classic case of a successful dc line that was installed decades ago. It delivers surplus electricity from the hydro-rich Northwestern United States and Canada (essentially “non-stop”) all the way to Southern California during the heat of summer when air conditioning loads in that area cause demand for electricity to “peak”. The northern areas uses a great deal of electric heating, however; so in winter the general flow along this dc line has simply been reversed.

The precise number of ac cycles is extremely critical. Sixty alternations per second translates into 3600 per minute. This means that each and every turbine feeding into a grid must turn at exactly 3600 revolutions-per-minute (rpm), and all must be synchronized within considerably less than a single turn. If even one packet of power reaches the network out of sync, the entire system can go down. This is the big stumbling block in expanding a region within which electricity is to be delivered, using ac only.

⁹⁷ According to sponsors, the Sonora-Arizona Interconnection would use ac within the United States and Mexico, but would not require that networks in the two countries be synchronized with one another. Power would be converted from ac to dc in a facility right at the border, then reconverted to alternating current that matches the separately synchronized grid on the other side.

When the energy flows across borders (state, provincial, or national), some areas are apprehensive about accepting the additional risk involved.

Most non-specialists are surprised to learn that none of the three countries of North America yet has a true “national grid” – although the incentives to achieve such are strengthened by some of the same factors that favor continental energy interdependence. There are four regional divisions in Mexico and three in the United States, while the electrical network in each of Canada’s provinces is more or less independent.

None of the three countries has a totally synchronous electrical grid within itself. The “national” grid of Mexico does not extend to Baja California; and there are some 88,000 communities within the country it does not reach at all (leaving an estimated 5,000,000 citizens without access). The Lower 48 United States are served by three primary interconnections – one basically west of the Rocky Mountains, one to the east, and a separate one serving most of Texas. By and large, Canada’s putative network is divided by provincial boundaries.

Curiously, the western province of Saskatchewan is synchronous with the eastern United States – but not with Alberta, its immediate Canadian neighbor to the west. The SaskPower system is joined to Alberta via back-to-back high-voltage dc converters, but is tied directly into the systems of North Dakota and Manitoba (which itself is connected synchronously with both North Dakota and Minnesota). Thus, SaskPower suffered a slight drop in frequency from the eastern blackout on August 14, 2003; but it was not large enough to cause problems. Ordinarily, according to the Manager of Network Development, Saskatchewan welcomes the Manitoba-and-U.S. connections because they protect it from the need to “shed customer load” whenever a 300MW generator “trips”

(by replacing the necessary power instantly and spreading the requirement over a huge area).⁹⁸

As for Canada's spread-out but sparsely populated northern tier (the Yukon Territory, Northwest Territories, and Nunavut), there are no integrated electrical networks at all among the isolated communities and no interconnections with the provinces.⁹⁹

Obviously, the electricity market in North America does not fully cover the continent as a single unit. I doubt that it will in my lifetime; and there is no pressing need for it to do so. The bulk of trade between the United States and Canada takes place via dc intermediation; but this is limited, unless and until the infrastructure is modified. Yet the links between these two countries are extensive enough already to have had profound effects (generally beneficial to each partner). Along the southern U.S. border, the remaining gaps in a continental power-net are far greater – because traffic has been predominantly unidirectional most of the time. Southern California and Northern Baja are synchronous, so alternating-current connections have been used between them for many years; but trade has been mostly like that on the Pacific Intertie – reversing seasonally. That pattern could change before long, however, because the new facilities at Rosarito will be the largest assembly of fossil-fueled generation on the West Coast of North America. Meanwhile, as in many cases, Texas has established its own unique habits. Utilities within ERCOT sell power to Mexican communities periodically; but this has been done by special arrangement. On an *ad hoc* basis, a generating plant in Texas will

⁹⁸ Personal e-mail communication from Kelly Staudt, forwarded on request by Timothy Egan, January 27, 2004.

⁹⁹ NEB, *Canadian Electricity: Exports and Imports, An Energy Market Assessment*, Calgary, January 2003, p. 17.

deliberately cut itself off from the area it normally serves . . . and synchronize itself temporarily with the Mexican customers.

There is little doubt that each country would stand to gain overall in flexibility, reliability, and economic efficiency from being synchronized completely within itself – or at least by bolstering dc connections that could permit its major regions to interact massively when this is desirable. Despite the additional cost, one advantage of using dc at interregional transfer points is that the conversion points interrupt a “domino effect” that otherwise could take place if a major part of any system collapses. This is what protected Quebec from the 2003 blackout. By the same token, it would be interesting to assess (if possible) whether incorporation of the Quebec system synchronously into the systems that collapsed could have averted that collapse.

Lacking a full continental grid, a reasonable (and more easily achievable) compromise would be to establish a number of regional transmission arrangements to provide quasi-complete coverage. That is the direction in which we are headed. The problem comes in reaching agreement on the number of RTOs and their individual locations and extent.

The Neglected Factor – Time

Perhaps in part because energy policy analysis in the 1970s had not yet acquired some of the sophistication that can come with harsh experience, Keohane and Nye did not pursue certain aspects of contemporary energy relationships that deserve more attention. One of these is time. In an effort to offer parsimonious theory, their graphic contrast between sensitivity and vulnerability relegated the critical factor of time to a

footnote on page 12 – and then referred to time only in the sense that some “appropriate discount rate” might have to be applied to future costs in order to evaluate current damage. In fact, the time that elapses before proposed policies can become effective is absolutely vital in projecting costs and benefits, regardless of whether this is recognized by politicians and the general public.

In their sensitivity-vulnerability example Keohane and Nye cited policies that would take decades to unfold -- achievement of self-sufficiency in petroleum and development of alternative energy sources. Yet the full social and economic expense of reaching such distant policy goals ought to be reckoned from the present, and delay-costs are governed largely by shortening or lengthening the “time to resolution”. Furthermore, some of the key adjustments facilitated by energy interdependence involve relatively short periods – from months down to literally moments (e.g., in forestalling the collapse of a power network, regardless of the cause). In fairness, the full range of time possibilities should be considered.

Short-term Situations -- The most rapid example of adjustment that takes place in an interconnected energy market is what happens to the flow of gas or electricity in response to either a surge of demand or a sudden cutoff in normal supply. Gas that has been stored can be inserted into pipelines, and the delivery capacity of an existing line can even be increased if necessary by stepping up the pressure. Hydroelectric facilities can be regulated with relative ease (analogous to that of a water tap); and standby combustion turbines can be brought on or off line with roughly comparable speed. This is true even for a system that serves a fairly small region (such as part of one state); but flexibility in response increases with the number of separate units in a supply system that

is adequately linked and coordinated. On a continental level the concept becomes one of “defense in depth” to cope with sudden changes in either supply or demand. Uncertainty about whether or not energy of any particular form will be available when required is itself an intangible but real cost. An actual interruption in electricity supply for a matter of hours can cost billions of dollars.

Medium-Term Situations – Within a slightly longer time range, the supply of natural gas over a broad area such as North America can be increased (for a while) simply by utilizing more drilling rigs and allocating more of the available equipment temporarily to known fields where the likeliest major product will be natural gas rather than oil. Shortages (or even the perception of scarcities) prompts higher price; and that in turn spurs producers to expand supply and introduce substitutes. U.S. industry statistics from the “gas price crisis” of 2000-2001 displayed this phenomenon vividly.

It may be years before the full story of what happened then is untangled. Corporate deceit and regulatory bungling complicated matters considerably. However the convergence of the gas and electricity markets had never before entered public consciousness with such a jolt. California endured rolling blackouts, while the price of generating power at gas-fired installations (where fuel represents the bulk of total cost) soared. The day-to-day price of natural gas on the spot market reached unprecedented levels – far exceeding its inherent value in pure energy content as compared with oil.

During the year and a half between April 2000 and September 2001, the number of U.S. rotary rigs aimed at producing oil remained relatively flat – roughly between 200 and 250. Meanwhile, however, the number of gas drilling rigs sloped upward rather steadily – from fewer than 650 during the spring of 2000 to an average of more than 1000

operating throughout the summer and early autumn of 2001.¹⁰⁰ Over the same 18-month period, the wildest fly-up in U.S. natural gas prices ever recorded was followed by a steady and ultimately reassuring relaxation. From \$2.86 in April 2000 the average wellhead price per thousand cubic feet of U.S. gas (which directly or indirectly affected gas prices for both Canada and Mexico) rose quickly past \$3, \$4 and \$5 . . . until it peaked at \$6.82 for the month of January 2001. (That meant it was selling at the rough equivalent of \$50-a-barrel oil.) But then it plummeted with comparable speed – to less than \$6, \$5, \$4 and \$3, until it settled back at \$2.94 for September 2001.¹⁰¹ As might be expected, the wholesale costs of electricity generally followed a similar rise and fall -- although the huge regional disparities in this price gauge make the actual statistics hard to pin down. Meanwhile, Canadian gas production happily defied predictions by some industry analysts that it might start to decline; and exports to the United States actually stepped up in the fall and winter of 2000-2001 – utilizing newly created pipeline capacity.

During 2003 (and especially during the bitter winter of 2003-4), spot gas prices and the prices of near-term natural gas futures surged again. The number of gas drilling rigs increased in response; and it remained to be seen how prices would react. This is, after all, a never-ending process. Specific problems can hardly ever be predicted. What needs to be understood is that underlying problems of price and supply are not the result of interdependence. The point here is not even how or why the market works; it is that the market has worked and with reasonable speed. At least part of the credit belongs to the resiliency of an interconnected continental supply framework for both gas and electricity.

¹⁰⁰ *MER*, July 2002, Table 5.1.

¹⁰¹ *MER*, July 2002, Table 9.11, and *MER*, November 2003, Table 9.11..

It could hardly be denied that Canadian and Mexican energy consumers were more sensitive to that 2000-2001 price shock because of the integration of North American markets that had already taken place. There was grumbling in Toronto (later to be exacerbated by the 2003 blackout), and Pemex felt forced into giving its gas customers *ad hoc* price relief. It is equally clear that popular support for market integration (which still needs further reform in regulatory structures and practices) has suffered as a result. But consumers in all three countries proved less vulnerable to serious, lasting economic damage from the complex of events than they would have been if responsive energy networks had not been able to quicken interregional adjustments. California's energy difficulties did not arise from the energy derivatives market, electronic trading, or cross-border transmission systems for gas and electricity. If that state had been more openly and sensibly "energy interdependent" with the rest of the U.S. and continental networks, both the seriousness and the duration of the price and supply problems it went through could also have been alleviated.

The temporary scarcity that brought so much adverse publicity was related to a long list of coincidental causal factors. They included: 1) low precipitation that limited hydroelectricity supplies; 2) higher-than-projected growth in electricity demand, coupled with the broad switch to natural gas as the preferred fuel for new capacity; and 3) California's flawed program of energy industry restructuring, which invited price shenanigans – especially across state borders -- while subverting the forces of normal market adjustment. Similarly, panicky reactions that followed – both in California and Mexico – weakened the efficacy of the integrated market in resolving the problem, as each tried to cap or roll back prices artificially.

Long-Term Situations -- As the time horizon lengthens, it becomes more difficult to suggest without fear of contradiction that North American energy interdependence reduces the costs of problem solving (including those associated with extended uncertainty). Still, some examples can be offered – beginning with variants of the two policy goals Keohane and Nye mention – energy self-sufficiency and the development of alternatives to petroleum. Although this involves a greater amount of speculation as contrasted with statistical evidence, the emergence of a continental market for gas and electricity seems to move all three countries in the right direction on both scores.

U.S. reliance on shaky Persian Gulf oil supplies would be far greater without imports from its two friendly neighbors. Yet they benefit in turn from this country's buildup of an emergency Strategic Petroleum Reserve, the mere existence of which for the past two decades has helped (at least somewhat) to dampen volatility in oil prices that can hurt net exporters as well as net importers. Absent customers in the United States, it is hardly conceivable that Canada would have progressed as rapidly as it has in developing either its western oil sands or its offshore oil and gas resources. Similarly, it is hard to see how Mexican leaders would have dared to modernize and expand their country's energy sector as they have within less than a decade if it had not been for accommodating market-partners on the continent.

The NAEWG has barely begun to explore its potential in such areas as energy efficiency, technology transfer, and environmental protection – all embodying long-range goals. For instance, the “Energy Star” system of appliance labeling and promotion is

assuming continental scope – although one would be hard-put to produce numerical evidence of how much energy it actually saves. Another advantage of an extended market (especially one committed implicitly to making regulations “compatible” with one another even though they may remain distinctively adapted to national preferences and capabilities) is that new technologies for energy production and/or use can reach economic viability sooner. For example, wind generators, photovoltaics, and other forms of “distributed generation” hold special appeal in Mexico; but their focused development should benefit Canada and the United States as well. Their installation anywhere should contribute to lower future production costs for all (through economies of scale) and valuable practical experience in operation. Such possibilities are enhanced by the existence of NAEWG – which is both a part and an outgrowth of the evolving North American gas-electricity regime.

IV. WHAT MAKES UP THE GAS & ELECTRICITY REGIME?

A Matter of Definition and Comparison

“International regimes are defined as principles, norms, rules, and decision-making procedures around which actor expectations converge in a given issue area.”

■ Krasner (ed.), *International Regimes*, p. 1

According to Krasner, “Regimes must be understood as something more than temporary arrangements that change with every shift in power or interests.”¹ Even so, an argument can be made that almost any well functioning market embracing more than one country may be considered a regime if it persists for an extended period and operates within an institutionalized structure. The World Trade Organization is a global illustration. The Organization of Petroleum Exporting Countries (OPEC) is also an international regime of sorts, which happens to deal with a specific energy source. But the regime being treated here differs markedly from either of those.

The gas-electricity system within North America exemplifies a geographically and functionally specialized international regime whose origins can be traced and analyzed in a way that provides some fresh and valuable insights into the very nature of regimes. The defining characteristics of its operation are tied to physical contiguity. While OPEC has always been outward-looking in its goals, this regime is primarily inward-looking. Its long-term growth and enduring vigor seem inexorable, despite some deterring recent events and the lack of central control. Its internal adjustments – aimed at satisfying individual national policy goals through a collective mechanism that happens

¹ Krasner, *International Regimes*, p. 2.

to work (“energy interdependence”) -- are the result of dynamic balance, and thus are ultimately self-controlled -- even though they respond to global events.²

One of the “energy myths” Doran addressed in 1977 was that of inevitable OPEC “cohesion”, which he associated with its ability to endure.³ He cited four sets of “interrelated forces” that had enabled this oil-exporting club a few years earlier to “capture” the oil market within five months⁴ – just as I have cited four or five factors that had to be in place for the North American gas-and-electricity regime to come together for mutual benefit within less than a decade. Doran also detailed alternate methods of reaching consensus within OPEC on production quotas and target prices – a consensus that is vital for the organization to be effective, but hard to achieve and maintain because its members’ interests vary so considerably from one another.

OPEC’s members searched for cooperative formulas for more than a dozen years before circumstances permitted the organization to assume price control globally. Since the 1970s its collective power has waned and waxed and waned. Its members have failed on several occasions to reach the “right” decision for their overall good. By forcing oil prices too high, for instance, they have brought non-OPEC oil production into play – weakening OPEC control.

A salient conclusion drawn from the contrast between OPEC and the North American gas-electricity regime is how little the national power of the respective North American governments enters the interdependence equations. Hence the North American market is more stable . . . and potentially (as “deregulation” continues) more efficient.

² The manner in which change takes place within this regime will be treated in the final chapter, Chapter VIII.

³ Doran, *op. cit.*, Chapter VI.

⁴ *Ibid.*, pp. 134-5.

Fitting an Abstract Model

The interdependence of Canada, the United States and Mexico in respect to natural gas and electricity, as outlined in the preceding chapter, is both a product and a source of the trinational energy regime that has appeared. The details of both that interdependence and the related regime continue in flux.

The “actors” include producers, consumers, and intermediate marketers – not only of gas and electricity, but also of the myriad devices, systems and enterprises that depend on these energy sources. In addition, the cast includes governmental entities at all levels, as well as non-governmental organizations. The latter range from the Sierra Club to labor unions within the Mexican petroleum and electricity monopolies to the Conference Board of Canada.

In the very broadest sense, the key principles embrace free trade and market competition; but these are so hedged by proprietary interests, capital and technology limitations, national traditions, labor practices, regional rivalries, and regulatory uncertainties that the evolution of energy interdependence sometimes seems to be proceeding in the crabbed style of a kabuki dance. For the private sector, the importance of the regime’s existence is that the formal or informal risk analysis preceding a North American energy purchase or investment decision has been immensely simplified in comparison to what it would have been 20 or 30 years ago. For federal authorities in each country, energy interdependence affects what national policy choices can be made as well as which ones should be pursued.⁵

⁵ The manner in which this takes place will be explored in Chapter VII.

Writing from their broader perspective, and even before they had defined the term “interdependence” itself in any sense, Keohane and Nye announced in their opening chapter the nexus between their intended topic and international regimes:

Interdependence affects world politics and the behavior of states; but governmental actions also influence patterns of interdependence. By creating or accepting procedures, rules, or institutions for certain kinds of activity, governments regulate and control transnational and interstate relations. We refer to those governing arrangements as *international regimes*. [emphasis in the original]⁶

Regimes may involve transgovernmental and transnational relations as well as those between and among states as such. Transgovernmental contacts are those that bring together counterpart representatives of departments, ministries, agencies, bureaus, and other official entities of governments from two or more countries without the formality of state-to-state relations at the “high politics” level. In energy, these are epitomized by the semi-regularized ministerial conferences that take place among the NAFTA partners (and the “sherpa” work efforts that must accompany them), as well as the North American Energy Working Group (NAEWG) established in 2001. But these are only part of the story, even within the governmental framework. Many departments and agencies outside the narrow energy field may have profound effects on it. The Export-Import Bank is one of many examples – as the 1977 Mexican-U.S. Gas Deal case study in Chapter VI illustrates. One must also count various bilateral and trilateral bodies that have been established to deal with environmental protection, labor matters, and general dispute resolution – all of which impinge on energy trade. There are also governmental but subnational actors – city, state, and regional representatives.⁷ Transnational relations

⁶ Keohane and Nye, p. 5.

⁷ One section of *NAFTA in Transition*, edited by Stephen J. Randall and Herman W. Konrad, deals with Energy and the Environment; and its four selections (pp. 255-326) are a useful starting point for developing

(according to the definition accepted by Keohane and Nye, among others) are by contrast non-governmental. They involve corporations, business and trade associations, labor organizations, environmental action entities, public interest groups, and the mass media, to mention only some of the most obvious actors.

The adhesives that hold regimes together range from highly formal written treaties to informal “understandings” and customs that grow up whenever human elements interact over time. Thus they incorporate commercial contracts in any situation where such agreements are respected and protected by government practice and (preferably) by national commitment. It is significant that NAFTA extends the dispute settlement provisions of chapters 18 and 19 of the CUSFTA to Mexico. A cabinet-level North American Free Trade Commission was established to administer the agreement and adjudicate disputes over how NAFTA rules are to be interpreted and applied.⁸ However, the dispute resolution mechanism under NAFTA has been justifiably criticized because of its *ad hoc* approach (there is no permanent body of panelists) and the lack of transparency (either in how decisions are reached or the reasoning behind them). The resulting lack of “precedents” to guide future action represents a regime weakness.

There could undoubtedly be disagreements in the future that are specifically confined to energy issues, yet clearly outside the provisions of NAFTA (e.g.,

a description of the energy regime. For example, the chapter by Alan Sweedler describes on pp. 263-278 how a regional energy plan drafted by the San Diego Association of Governments in 1994 helped to crystallize the expanded opportunity for fruitful exchange of gas and electricity between California and Baja California. However, because *NAFTA in Transition* was published in 1995 and is based on even older data, it is only a starting point. For instance, it speaks of plans for supplying Rosarito generators with U.S. gas as a future possibility. In fact, it was only in 1995 that Rosarito itself was created as a municipality separate from Tijuana. Today, the generating facilities operating and under construction at Rosarito represent perhaps the largest fossil-fueled powerplant complex on the west coast of North America, and they do use U.S. gas.

⁸ Hufbauer, Gary Clyde, and Schott, Jeffrey J., *NAFTA: An Assessment*, Institute for International Economics, Washington, 1993, pp. 142-3.

interpretations or implementation of import-export licensing procedures). At least one high U.S. official⁹ who has been close to the trilateral operations of NAEWG believes personally that (although it might take many years) we will eventually develop some specialized, workable, trusted mechanism for resolving energy disputes among the three countries. After all, this regime is still evolving.

Furthermore, energy relations among the three North American partners go well beyond NAFTA provisions, and the only case with strong energy ramifications that has been brought under that Treaty's Chapter 11 (which allows firms to seek reimbursement if governmental action directly or indirectly nationalizes an investment) is a damage claim for nearly a billion dollars by Methanex. This Canadian producer of methanol charged that California's environmental ban on a gasoline additive (MTBE) using its product was a selective trade barrier that would stifle its substantial export trade to the United States (and thus violated NAFTA principles). The case has dragged on for years, and at the time of this writing still had not reached judgment or settlement;¹⁰ but it seems very unlikely that the company will eventually be awarded anything like what it is asking. The U.S. State Department's initial response was dismissive. It said that "Methanex's claim does not remotely resemble the type of grievance for which the States Parties to the NAFTA created the investor-State dispute resolution mechanism of Chapter 11." It went on to call "absurd" the idea that "whenever a State takes action to protect the public health or environment, the State is responsible for damages to every business

⁹ Vincent DeVito, then Senior Policy Advisor for North American Affairs, U.S. Department of Energy (personal communication, January 28, 2003).

¹⁰ The Monterey Institute of International Studies has produced a Teaching Case Study of "MTBE and NAFTA" as part of the International Commercial Diplomacy Project. It is available at http://www.commercialdiplomacy.org/case_mtbe_public.htm

enterprise claiming a resultant setback in its fortunes if the enterprise can persuade an arbitral tribunal that the action could have been handled differently.”¹¹

Environmental regulations often differ from state to state or Canadian province to province, and it is far from clear that the central government in either situation has the means to enforce conformity based on a national treaty commitment. Referring to Annex 41, Bradley J. Condon states flatly that “the NAAEC is not binding on any Canadian province that does not agree to abide by it and Canada cannot enforce the Agreement against Mexico or the United States unless the environmental law in question would fall under federal jurisdiction in Canada or, if not, a majority of the provinces have signed on to the agreement.” Based on Article 45.2(b), he also notes that “laws regarding the management or exploitation of natural resources are excluded from the definition of ‘environmental law’ making their enforcement immune to attack under the NAAEC.”¹²

William A. Orme, Jr., has written probingly about NAFTA and the “new North America” since before the treaty came into effect,¹³ and his thoughts about its sweeping implications should be kept in mind insofar as they pertain to the energy regime:

Internally, by forcing Mexico to reform its investment rules, NAFTA creates a common set of rules for all North American business, not just importers and exporters. It reinforces and accelerates a process of interdependence which over time should lead to increasing coordination of environmental and labor rules, fiscal and monetary policies, immigration and naturalization procedures, and other areas of common concern. NAFTA and the economic integration it will foster will make it impossible to avoid these issues. It will also provide structures to address them – structures that will

¹¹ *Statement of Defense of Respondent United States of America in the Arbitration under Chapter 11 of the North American Free Trade Agreement and the UNCITRAL Arbitration Rules between Methanex Corporation, Claimant/Investor and United States of America, Respondent Party*, I. Preliminary Statement, paragraph 2.

¹² Bradley J. Condon, “The Impact of the NAFTA, the NAAEC, and Constitutional Law on Environmental Policy in Canada and Mexico”, in *NAFTA in Transition* (Stephen J. Randall and Herman W. Konrad, eds.) University of Calgary Press, 1995, p. 285.

¹³ Orme, William A. Jr., *Continental Shift: Free Trade & the New North America*, The Washington Post Company, Washington, 1993.

evolve and expand as integration deepened.

These structures will not resemble Europe's. The European Union has given common markets an undeservedly bad name. The NAFTA market will be indigenously North American: less officious, more spontaneous and diffuse, yet clearly oriented towards the practical business of trade and investment. That's not merely because Americans have a deeply ingrained anti-bureaucratic bias that Europeans lack (though it helps). It's also because North America doesn't need elaborate institutions to achieve real market integration.¹⁴

Because most industrial and commercial energy activities are (and are likely to remain) regulated to some extent and in some fashion in every country, all governmental authorizations and licenses (in addition to contracts) that are required to build pipelines, sell natural gas at the wholesale or retail level, operate generating plants, or carry out the host of other relevant activities also fit into the fabric of the energy regime. Licenses are part of the rules (or process); the licensing bodies and the constraints on their operation are part of the regime structure. "Energy Picture" devoted nearly one-third of its 73 pages (pp. 43-64) to "Legal and Policy Frameworks" – primarily a review of energy regulation within the three countries. A background paper published by the Commission for Environmental Cooperation examined the relationship between NAFTA rules and national or subnational electricity policies, such as renewable portfolio standards and performance standards.¹⁵

One NAEWG subgroup has produced a 13-page report devoted exclusively to the regulation of cross-border electricity trade within North America, giving a side-by-side comparison of requirements, criteria, and procedures pertaining to each country.¹⁶

Another subgroup is preparing a similar document for cross-border trade in natural gas.

¹⁴ Orme, William A., Jr., *Understanding NAFTA: Mexico, Free Trade, and the New North America*, University of Texas Press, Austin, 1996, p. 290.

¹⁵ Horlick, *et al.*, "NAFTA Provisions and the Electricity Sector", CEC, Montreal, 2001.

¹⁶ North American Energy Working Group, "North America: Regulation of International Electricity Trade," December 2002.

Yet another has released a roughly analogous report on efforts to “harmonize” energy efficiency standards, energy product labeling, and the testing of energy equipment and appliances.¹⁷

By early 2003, minimum performance standards (and test procedures) had become nearly identical or very similar in all three countries for refrigerators, freezers, and both central and room air conditioners – almost all of which use either electricity or natural gas; and commonality was anticipated in the near future for dishwashers, clothes washers, and both fluorescent and incandescent lamps. Canada in particular has also pushed the idea of “mutual recognition”. According to this concept, the satisfactory testing of products in one country would bring automatic acceptance in the other two (thus eliminating the duplication of test processes).¹⁸ In any case, this element of the emerging and ever-more-comprehensive regime would permit “actor expectations” (namely, those of buyers and sellers of devices that consume gas or electricity) to “converge”.

A question that is often raised about regional trade compacts is whether a future mode of expansion might be by “broadening” or “deepening”.¹⁹ Because energy interdependence as described in this dissertation is part and parcel with physical contiguity, however, that query becomes largely irrelevant at this time if not moot. Even if Venezuela should resume a larger role in supplying petroleum to North America and

¹⁷ North American Energy Working Group, “North American Energy Efficiency Standards and Labeling”, January 2003.

¹⁸ See, for instance, an address by The Honourable Pierre Pettigrew, Minister for International Trade of Canada, at the 8th Annual Canadian-American Business Achievement Award and International Business Partnership Forum, October 16, 2002, on “The Canada We Want in the North America We Are Building”, p. 4.

¹⁹ For instance, see Charles F. Doran, “Whither North America?” in Donald Barry, *et al.* (ed.), *Toward a North American Community? Canada, the United States, and Mexico*, Westview Press, Boulder, 1995.

should become a major supplier of LNG as well, it could still hardly aspire to becoming part of this precise regime. Unless and until LNG “trains” became continuous, they would not offer instantaneous response; and it would still be hard to imagine reversible flows. Economic, wireless delivery of bulk electricity is still in the realm of science fiction; and trans-oceanic power cables would seem to be an even more remote prospect.

In terms of pipeline and powerline access, Canada is isolated from every country in the world except the United States. Mexico under President Fox is determined to pursue its long-discussed plans for direct links to Guatemala and the rest of Central America; but its initial role there will surely be as a one-way supplier, and it will even be a long time before some parts of Mexico (e.g., Chiapas and Tabasco) can become interactive players in the fast-growing but still-incomplete North American gas-and-electricity network. The prospect for growth here involves only deepening . . . and increasing intensity of exchange.

Variety and Harmony in National Energy Regulation

In explaining the “coalescing pressures” that have begun to move Canada, Mexico, and the United States toward his ideal of a “North American Community,” Robert A. Pastor has written: “Governments that adopt public policies similar to those of their neighbors usually do so for two reasons – to improve competitiveness or to experiment with a better idea.”²⁰ To the extent that the energy regulatory structures in these three countries have become more compatible with one another, both reasons can be deduced. However, there are probably permanent limits to this trend – based not only

²⁰ Robert A. Pastor, *Toward a North American Community*, Institute for International Economics, Washington, August 2001, p. 91.

on varied perceptions of national interests (a point that will be revisited in Chapter VII), but also on differences in federal structure and practice.

The United States has its Federal Energy Regulatory Commission (FERC), and Canada its National Energy Board (NEB)²¹; but many details of energy regulatory policy are neither determined nor enforced by any single body in either country. States and provinces have enormous discretionary power, although movements of energy across international borders (and across state boundaries within the United States) are generally subject to some federal regulation, if not always via FERC. Mexico comes closer to speaking with a single voice through its relatively new *Comisión Reguladora de Energía* (CRE), but to earn full credibility in this regard that agency will have to continue to demonstrate its ability and willingness to exert authority over the state-owned gas and electricity enterprises (*Petroleos Mexicanos* – Pemex, *Comisión Federal de Electricidad* – CFE, and the electricity entity responsible for electricity supply and distribution in and around the capital, *Luz y Fuerza* -- LyF).²² The natural tendency of these parastatal organizations to collaborate in resisting any type of formal regulation (which offered them no constraints at all until the past few years) is reinforced by the fact that the Director General of Pemex is a statutory member of the CFE.

Undoubtedly the most striking element in the North American energy regime is the role played by the North American Electricity Reliability Council (NERC). This is a

²¹ A brief but useful self-description of NEB can be found in its pamphlet entitled *Answers to Your Questions*, Calgary 2002. A free copy may be obtained by calling 1-800, 899-1265 (toll free)

²² In August 2000 CRE announced proudly that it had become the first regulatory agency in the world to receive certification from *Laboratori General D'Assaigs I Investigacions* for its Quality Assurance Program in natural gas and electricity permit regulation, after a comprehensive audit by that body to check on such attributes as reliability, professionalism and impartiality. In another signal of regulatory evenhandedness at about the same time, Mexico's Federal Competition Commission ruled against Pemex in a dispute over monopolistic practice in respect to retail gasoline marketing.

non-governmental umbrella body through which elements of the power industry all over this country have consulted with one another for decades about their individual outlooks and plans for generation and transmission capacity, in order to agree upon a variety of voluntary cooperative efforts to avoid blackouts and brownouts. It has always included a mélange of public, investor-owned, and cooperative enterprises that manages to work together despite diversity of ownership (and thus some differences in philosophy). As an important component of the North American gas and electricity regime, however, NERC embraces not only the continental United States but also all the provinces of Canada, the northern part of Baja California, and (through a working association with Texas) the rest of Mexico's CFE. Furthermore, a truly revolutionary feature now is that NERC has been trying for the past several years to transform itself from a totally voluntary group into a self-regulating organization (North American Electricity Regulatory Organization, or NAERO) with powers to compel compliance with its decisions²³.

The administrations of Presidents Bill Clinton and George W. Bush both proposed legislation that would authorize FERC to enforce such decisions, although it was Republicans in the Congress who blocked its consideration before the November 2000 election. Such an increase in NERC's clout would have international ramifications only if Canada and Mexico adopt similar arrangements; but the sheer prospect of investing a non-governmental body with decisionmaking powers over commercial and governmental

²³ As of mid-2004, the U.S. Congress had still failed to pass a "comprehensive" energy bill; and efforts to include a strong "electricity title" seem to have been doomed for the time being by regional opposition. An early draft, however (developed by House Republicans in the 2003 session, but later dropped) embraced the sorts of reforms that would pave the way for much stronger continental interdependence in electricity. It would have given FERC eminent domain for critical transmission lines in case of delays exceeding one year, broadened FERC's jurisdiction to include municipally owned utilities, rural electric coops and the huge federal power marketing entities such as Bonneville Power and the Tennessee Valley Authority, authorized those federal giants to participate in regional transmission organizations, and "certified" NERC to "*enforce* reliability standards for the bulk-power system" (emphasis added).

operations in even the narrowest of fields in all three countries represents an astonishing potential breakthrough for an international regime. Even Canada's Natural Resources Minister (then Ralph Goodale) tacitly accepted the principle of enforcement, while implying that this should somehow come supranationally. In the text of a speech before the Toronto Board of Trade on September 6, 2001, he said: "There is support at all levels on the Canadian side for an International Self-Regulating Reliability Organization to develop and enforce mandatory standards." In light of this, it is worthy of note that there have been frequent contacts between NERC and the North American Energy Working Group . . . and that Goodale's immediate successor (Herb Dhaliwal) seemed more expansive in his rhetorical approach to the need to explore continental energy cooperation. It is probably too early to characterize the personal attitude of the latest official to head NRCan, R. John Efford; but in general the new administration of Prime Minister Paul Martin seems to be more dedicated than that of Chrétien to seeking harmony within the NAFTA triad.

Unfortunately, there has been considerable opposition from numerous state public utility commissions (and governors) to any expansion of FERC authority – even in respect to a "standardized market design" (SMD) that would regularize requirements and procedures within transmission regions in order to encourage the investment of needed risk capital from the private sector. The objections raised may actually boil down to a reluctance to yield political power; but public protestations are typically cloaked in economic analyses that project relative economic disadvantages (on a state-by-state basis) in the short term . . . while longer-term advantages have yet to be demonstrated and might be largely on a regional or national basis. A parallel resistance to more open competition

has appeared in Canada, where provincial governments have re-instituted rate ceilings for retail electricity (with the implication or assumption that isolation from external price fluctuations is more beneficial to consumers than accepting both the ups and downs of operation within a broader market).

A final complication in the regime that already exists lies in what seem to be transverse forces connected to industry restructuring. All three countries have moved to break up both the gas and electricity industries within their borders by function. Separate sets of rules now govern production, long-distance transport, and local distribution of either gas or electricity. For example, a single U.S. company may engage in all three parts of the business, but only if the operations are conducted more or less at arm's length from one another and with a high degree of transparency.²⁴ This explains why many electric utilities in the United States (where the market for basic electricity supply is now subject to price competition) chose to divest themselves of generating facilities and to concentrate on the still tightly regulated phase of distribution (thus continuing to enjoy reduced risk in return for accepting an effective ceiling on rates of return), or at least have set up autonomous subsidiaries. At the same time, however, consolidation and integration took place in order to win market share and flexibility. Not only was there a flurry of utility mergers around the turn of the century²⁵; some companies (such as Enron, Duke, El Paso, and others) moved aggressively to acquire capabilities that straddled the gas-

²⁴ The allegation that the pipeline segment of El Paso Corporation collaborated with that firm's fuel-marketing arm in limiting supplies of natural gas to California during the winter of 2000-2001 in order to drive up the commodity's price there brought sharp attacks from the state government and forced a formal investigation.

²⁵ John Treat, Vice President (Energy) for Booz Allen and Hamilton, told the Fifth Annual Washington Energy Policy Conference – held at SAIS on April 6, 2000, that 555 utility mergers had taken place worldwide in 1999 alone, with most of these in the United States. He added that there had been 452 mergers the same year in the oil and gas industry.

electricity divide.²⁶ After the Enron scandal and other shocks treated in the next section of this chapter, however, major retrenchments took place. Pending applications for “merchant plants” were suspended, and numerous companies withdrew from energy trading as a major corporate function.

The North American Agreement on Environmental Cooperation might also be considered to be part of the gas-electricity regime, although Pastor and others seem to me to be exaggerating when they describe the Commission for Environmental Cooperation (CEC) established under this agreement as “a North American polycymaking body” (emphasis mine).²⁷ CEC influences policy. The symposia it sponsors, the studies it publishes, and the periodic deliberations and joint statements of its three Commissioners all help to set a tone of trilateral cooperation. But actions to implement any recommendations that develop must still be taken independently in each country, and thus are subject to limits on resources, will, and patterns of governance. Furthermore, Article 3 of the Agreement itself begins with recognition of “the right of each Party to establish its own levels of domestic environmental protection and environmental development policies and priorities, and to adopt or modify accordingly its environmental laws and regulations”. Nevertheless, CEC is important (and might become more important in the future) because of the pledge in the same article – which follows the disclaimer immediately with a promise that “each party shall ensure its laws and regulations provide for high levels of environmental protection and shall strive to continue to improve those laws and regulations” (emphasis added).

²⁶ For a specific case (that of KN Energy), see Joseph M. Dukert, *The Evolution of the North American Energy Market*, Center for Strategic and International Studies, Policy Papers on the Americas, vol. X, Study 6, October 19, 1999, pp. 17-18.

²⁷ Pastor, *Toward a North American Community*, p 76 (including footnote).

Environmental regulations surely affect the production of energy, especially as additional capacity is required. On April 1, 2003, for example, the New Source Emission Guidelines for Thermal Electricity Generation (issued under the authorization of the Canadian Environmental Protection Act) set “recommended” standards for the release of substances related to smog and acid rain that are 60 to 80 percent lower than those that had been in effect in Canada previously. By insisting on the emissions performance of the Best Available Control Technologies (BACT) that were judged to be currently feasible economically, these levels finally matched those in the United States. But Environment Canada had to admit that achievement of such standards Canada-wide would still depend on actions by the provinces; and in some cases the target date for that was 2010 – seven years down the road. Ultimately, the objective is to have coal-fired generators approach performance that is as clean as natural gas. The dilemma of coal-rich provinces is that such a situation might favor sales of that fuel – but only if total costs of coal-generation (even with the application of more expensive new technologies) remain competitive.²⁸

What Changed in 2000?

For North American energy interdependence, the year 2000 did not bring “a millennium” in the optimistic sense. The continental energy market had become more firmly established than the most optimistic observer could have predicted realistically in 1990. Nevertheless, it was about to face a series of obstacles that the most dogged pessimist might not have foreseen. The market lost momentum.

²⁸ “Canadian Clean Air Campaign: Government Reveals Emissions Plan”, in *Electricity Today Magazine*, accessed at http://www.electricityforum.com/et/issue0103/i01_emissions.htm

Elections in Mexico and the United States during 2000 brought results that initially seemed to favor even faster progress. For the first time in seven decades, the candidate of an opposition party (Vicente Fox Quesada) was elected to the Mexican presidency – signaling openness to change and modernization. Furthermore, the National Action Party (PAN) that had nominated him was the one considered most friendly to the private sector and a businesslike approach to encouraging private investment. In addition, while they were both candidates, Fox had established a cordial relationship with George W. Bush – now the newly elected President of the United States.²⁹ True, Canada’s Prime Minister Jean Chrétien was upset that Bush broke tradition and chose Mexico rather than Canada for his first foreign visit; but this was patched up semi-amicably when Chrétien rushed to Washington in advance of that event to reconfirm his nation’s “priority” on the North American agenda with a less formal visit and talks there.

What was not foreseen was that: 1) Fox would fritter away his early popularity and forego the customary Congressional reverence for the presidency in the face of a bicameral legislature where the long-dominant Party of Institutionalized Revolution (PRI) held a plurality, though no longer a majority. 2) Bush’s Republican Party would have only the tiniest majority in the U.S. Senate – which would disappear, in fact, through the defection of a New England Senator; Democrats rewarded Jim Jeffords for becoming an independent by making him chairman of the Environment Committee, where he helped block much of the President’s energy policy agenda for two years. 3) Prime Minister Chrétien and Natural Resources Minister Ralph Goodale paid lip-service to the concept of a North American energy market, but rarely lost an opportunity to

²⁹ The friendship would cool somewhat in subsequent years, due to disagreement over non-energy matters – U.S. actions in respect to Iraq, judicial use of the death penalty, failure to settle immigration issues, etc.

denounce publicly any effort they interpreted as a move toward a tripartite continental energy policy. Goodale did lead an energy business mission to Mexico City in 2001 -- having urged each of the companies whose executives accompanied him to “showcase its expertise and technologies, learn more about doing business in Mexico, and network with high-level Mexican government and business representatives”³⁰; but during that trip he also assured the Mexican press that trilateralism would never substitute for bilateral relationships.³¹

There were also other, fundamental difficulties.

During the winter of 2000-2001, the three-country market endured what some portrayed as a continental crisis in energy supply and pricing. A complex of circumstances caused prices for both gas and electricity to soar throughout much of the western United States. With both supply and pricing interconnected, it was inevitable that the effects would be felt instantly in Canada and Mexico as well. Causal factors included freakish weather which limited hydro potential) and unanticipated growth in California’s mammoth energy demand; but the stage had been set by inept regulatory reforms in that State – coupled with corporate greed and outright dishonesty in seizing the opportunity to exaggerate profits and to practice deceit in company accounting. Official State attempts to patch things up included retail price freezes and rollbacks that throttled demand response while wrecking utility finances. A hypocritical effort to hedge against future price fly-ups via long-term contracts at imprudently high prices led quickly and

³⁰ “An Invitation from Ralph Goodale, Minister of Natural Resources, Canada”, posted on the Internet at www.nrcan.gc.ca in mid-August, 2001.

³¹ David Shields, “Canada seeks hints from Martens on energy policy,” *The News* (Mexico City), October 17, 2001 (taken from the Internet – <http://www.thenewsmexico.com> - on November 9, 2001).

predictably to State insistence that the new contracts it had just insisted upon be renegotiated.

California itself remained in a budget squeeze that is likely to last for years, even though its voters sacked the “responsible” governor during 2003 in an historic “recall” election and chose a successor who said he favored free-market principles in energy. Overall, energy prices relaxed and apprehensions eased somewhat, even before Arnold Schwarzenegger took his turn as California’s chief executive. But confidence in competitive markets had been shaken badly in other parts of North America. Some state and provincial authorities drew back from regulatory reforms.³² Mexico undertook successive programs to decouple its domestic natural gas prices from those in Texas.

Coincidentally, the financial collapse of Enron put electronic trading of energy under suspicion. It didn’t matter that the corporation’s troubles appeared to lie within its own management rather than in industry reordering and the concept that competition can safely foster efficiency. Enron had pioneered modern energy marketing, and its creation suffered with the creator.

Could things get worse? Yes.

The terrorist attacks on New York and Washington on September 11, 2001, exacerbated a global economic downturn. Corporate investment priorities had to be shuffled, and the attention of governments was temporarily monopolized. In December

³² A “Performance Review of Electric Power Markets” carried out by the National Regulatory Research Institute at Ohio State University for the Virginia State Corporation Commission (dated August 30, 2002) reported that a competitive retail environment for electricity was allowed in 17 States and the District of Columbia, but that 18 other States had dropped consideration of such local restructuring while only eight were continuing their studies, and that four (Arkansas, New Mexico, Oklahoma, and West Virginia) had definitely delayed the implementation of restructuring laws that had already been passed. Two Western States (Nevada and Oregon) were allowing retail access to multiple electricity suppliers only for large customers, but California had completely suspended its program as of September 2001.

2001, McGraw-Hill's research unit reported that cancellations of new generating plants in the United States significantly exceeded new project announcements.³³ U.S. industrial demand for gas fell off, which helped explain why normal Canadian withdrawals from gas storage almost vanished.³⁴ Net withdrawals from U.S. storage at the end of January 2002 were the lowest ever recorded for the Department of Energy's weekly series.³⁵

Meanwhile, Mexico's President Fox was thwarted in his efforts to modernize his country's state-run energy enterprises and to open new avenues for private involvement where it could help most; and all three major Mexican political parties undertook internal realignments that left such changes stalled – to the frustration of a reformist President Fox, threatened by becoming a lame duck well before the end of his term in 2006. Energy relations between the Canadian and U.S. administrations were chilled by Prime Minister Chrétien's persistence in ratifying the Kyoto Protocol (even against strong resistance – on economic grounds --by provincial premiers) after President Bush had affirmed unilaterally that the United States would not ratify . . . and had irritated environmental organizations everywhere by repeating his own personal skepticism about the scientific basis for pursuing such action. As a crowning complication, the international crises over Iraq and North Korea meant that it might be a long time before clouds of uncertainty dispersed from risk-capital markets and peaceful energy cooperation could assume a more prominent position on government-policy radar screens anywhere in the world.

Nevertheless, the sagging spirits of the gas-and-electricity regime may be ready for a bounce. The fact that the 2003 blackout did not produce more than a short-lived

³³ Rebecca Smith, "Power industry cuts new-plant plans", *The Wall Street Journal*, January 4, 2001.

³⁴ Deutsche Bank Alex. Brown, Inc., "Looking for Silver Linings in US Gas", *Global Energy Wire*, January 10, 2001.

³⁵ U.S. Energy Information Administration, *Natural Gas Weekly Update*, February 11, 2001.

flurry of complaints against “interconnectedness” was a hopeful sign. Economic recovery also began; and the investment climate brightened a bit. But the most important indication was that federal governmental forces in all three countries were practicing support of trilateral energy cooperation – especially in the patiently plodding work of the NAEWG.

The Role of the North American Energy Working Group

This is certainly not by design, but governments and the private sector have taken turns in the advancement of the North American version of energy interdependence.

The mainframe of the North American gas and electricity regime could not have come together initially without actions by the national governments of all three countries. The Canadian-U.S. Free Trade Agreement had institutionalized the elimination of tariff and many non-tariff barriers to the exchange of both energy sources between these two trading partners. The negotiation of NAFTA extended rules of the basic trade regime to include Mexico, and (in a side agreement that was critical politically to ratification of the treaty itself – especially in the United States) established the tripartite Commission for Environmental Cooperation (CEC) that would clearly have some relation to energy policies within each country. Independently, each of the three also undertook its own set of reforms in the domestic regulation of gas and electricity – encompassing production, movement, and delivery/sale to consumers. To the surprise of many, Presidents Salinas and Zedillo tiptoed around the Mexican Constitution through the redefinition of such terms as “strategic” and “public service”.³⁶ Perhaps most important of all in the longer

³⁶ For a fuller explanation of how this was accomplished, see Dukert, *The Evolution of the North American Energy Market*. (especially pp. 11-12 and p. 8.)

run, Mexican authorities were quick to create an independent body (the *Comisión Reguladora de Energía*, or CRE) “to issue permits, enforce safety and environmental rules, and generally promote (and supervise) competition in a transparent way that could attract entrepreneurs through the prospect of fair profits at reasonable risk.”³⁷ Pemex and the national electricity monopolies did not need to be privatized, so long as the rules of competition were clear and firm for private-sector entities that would henceforth complement the activities of the parastatals in a variety of ways.

The continental energy market blossomed quickly between 1995 and 2001 (especially once the Mexican financial crisis of 1994-5 was surmounted quickly and convincingly³⁸); but development during that period came primarily through private-sector activity. This was a reflection of the broader scene; Pastor was moved to complain that “A North American Community is emerging at the social and economic level, but the governments are not leading.”³⁹ Former Energy Secretaries of both Canada and Mexico lamented the fact that – especially after the arresting shock of “9/11” -- the central governments of all three NAFTA signatories had fallen far behind energy companies and regional governmental groupings in recognizing and supporting the possibilities for mutual benefit through closer cooperation.⁴⁰ Just when the private and sub-national

³⁷ *Ibid.*, p. 14.

³⁸ For a crisp account of how the United States helped its NAFTA partner in an unprecedented way, see Riordan Roett, “The Mexican Devaluation and the U.S. Response”, in *The Mexican Peso Crisis: International Perspectives* (Riordan Roett, ed.), Lynne Rienner Publishers, Boulder, Colorado, 1996, pp. 33-48.

³⁹ Pastor, *Toward a North American Community*, p. 93.

⁴⁰ Jake Epp and Jesus Reyes Heróles, at a conference sponsored by the Brookings Institution in Washington, DC, December 6-7, 2001.

initiatives began to falter as well, however, “functional”⁴¹ governmental collaboration in the energy sector was ready fortuitously to take over the earlier thrust.

The North American Energy Working Group was conceived in early March 2001, when U.S. Secretary Spencer Abraham, Mexican Secretary of Energy Ernesto Martens, and Canadian Natural Resources Secretary Ralph Goodale held their own trilateral “mini-summit” during a Western Hemispheric Energy Ministerial Meeting in Mexico City. Secretary Abraham – brand-new in his job – invited trust with his glowing description to a hemispheric plenary session of mutual benefits available through North American energy cooperation that had already begun and an affirmation that there would be no “junior and senior partners” as the trilateral enterprise moved forward.⁴² Besides promising to institute the NAEWG, the three agreed “to establish a North American Energy Initiative aimed at encouraging, expanding and accelerating energy resource development,” as well as “to explore how to improve cross-border connections for electricity, natural gas, and oil . . .” And Abraham made the overall intent clear, even for the entire Western Hemisphere : “We are building the tools for energy interdependence,” he said.⁴³

Promises of international cooperation at the ministerial level do not always produce lasting results, but several events that followed in quick succession gave this one unusual cachet:

⁴¹ Keohane dealt with the willingness of national governments to pursue interdependence in the energy area for mutual benefit in two chapters of his work, *After Hegemony: Cooperation and Discord in the World Political Economy*, Princeton University Press, 1984. See Chapter 6, “A Functional Theory of International Regimes”, and Chapter 10, “The Consumers’ Oil Regime, 1974-81”.

⁴² Secretary of Energy Spencer Abraham, prepared remarks for 5th Hemispheric Energy Initiative Ministerial Conference, Mexico City, March 8, 2001.

⁴³ U.S. Department of Energy News Release No. R-01-069, “Energy Secretary Abraham Pledges Expansion of Hemispheric Energy Ties: Says Ever Freer Trade Is Not Just Desirable, It Is Essential”.

- 1) The three national chief executives (Bush, Fox, and Chrétien) held their own summit at Québec City barely six weeks later; and they anointed the prior cabinet-level pledge by mentioning specifically in their own joint statement the North American Energy Working Group which “our Energy Ministers have created”. The top leaders’ statement at Québec acknowledged NAEWG as a move toward “the development of a North American approach to the important issue of energy markets”; and it announced that “This technical-level forum will be a valuable means of fostering communication and coordinating efforts in support of efficient North American energy markets that help our governments meet the energy needs of our people.”⁴⁴
- 2) In outlining the Bush administration’s vision for energy a few weeks after that, the “Cheney Report” included as one of its executive-level recommendations “that the President direct the Secretaries of State, Commerce, and Energy to engage in a dialogue through the North American Energy Working Group [emphasis added] to develop closer energy integration among Canada, Mexico, and the United States and identify areas of cooperation, fully consistent with the countries’ respective sovereignties.”⁴⁵
- 3) In Canada, Chrétien signaled the breadth and significance of such cooperation by naming a cabinet-level task force (headed by the

⁴⁴ Joint statement issued April 22, 2001, by President Bush, Canada’s Prime Minister Chrétien, and Mexico’s President Vicente Fox (text supplied by The White House, Office of the Press Secretary).

⁴⁵ *National Energy Policy*, Report of the National Energy Policy Development Group (Washington), May 2001, p. 8-9.

Secretary of Foreign Affairs, rather than the Natural Resources Secretary) to oversee Canada's role in the development of a North American energy market.

- 4) During the first meeting of representatives from the three energy departments as the North American Energy Working Group in June 2001, President Bush paid his first visit to the Energy Department's Headquarters in the Forrestal Building; and his remarks included a salute to NAEWG's efforts that may have been a coincidental courtesy, but could hardly go unnoticed – either by DOE personnel or the foreign visitors.

Even then, the NAEWG gave the impression that it was uncertain about its own influence and ability to persist and succeed. No effort was made in any of the countries to call public attention to the Group's work. The respective delegations began to feel each other out cautiously, although some participants were careerists and had had some previous contacts (e.g., during the NAFTA negotiations). One – who should remain unnamed -- told me that it would be impossible for them to use such a strong word as “harmonize” in respect to energy policies (as I had done in an October 2001 panel presentation and a subsequent article⁴⁶) “for at least a year”.

As noted earlier, the September 11, 2001 terrorist attacks on New York's World Trade Center and the Pentagon – plus a global recession -- distracted attention of upper echelons at the State and Commerce Departments (along with their counterparts in Canada and Mexico) from most hemispheric energy matters. An exception was the

⁴⁶ Joseph M. Dukert, “Mutually Reinforcing, but Distinct, National Energy Policies for NAFTA”, *Looking Ahead*, National Policy Association (Washington), vol. XXIII, No. 4 , December 2001.

slowly growing concern⁴⁷ about protection of “critical infrastructure” – which included gas pipelines, powerlines, and electronic trading-and-delivery arrangements. But that sort of problem was too big to entrust to the energy bureaucracies alone. In the United States, the levers of action were located in the White House itself . . . and subsequently in a new Department of Homeland Security -- which promptly pursued intricate dealings with both Canada and Mexico.

The reasons why NAEWG did suddenly begin to plow ahead and pick up steam again on its own remain unclear. But by Spring 2003 the Group had held five full-complement meetings, rotating sites among the three countries. Besides issuing the publications referenced earlier, its sub-groups were openly seeking ways to harmonize terminology, procedures, and even “hardware”. For instance, one area being emphasized is equipment used to convert alternating-current flows of electricity to direct current and then back to ac. As explained earlier in this chapter, improvements and uniformity in technology of this type might prove helpful in beefing up east-west connections (e.g., between Quebec and Ontario, or the Eastern and Western Interconnections in the United States) as well as in north-south international trade.

Cooperation between energy and environmental authorities (which is of vital importance in the longer run) has come more slowly, despite the fact that the three heads of government at Quebec had “stressed . . . our common commitment to addressing

⁴⁷ By October 2001, when the U.S. Energy Association published a followup to the “Cheney Report” entitled *Toward an International Energy Trade and Development Strategy*, the final recommendation in its chapter on “U.S./Canada/Mexico Energy Trade” (pp. 17-22) was that the U.S. Department of Energy should coordinate the protective efforts for electricity and gas infrastructure that had been undertaken separately by NERC and the National Petroleum Council.

environmental impacts of energy use.”⁴⁸ The three national environmental chiefs who make up the Commission for Environmental Cooperation were briefed by an NAEWG representative on that group’s work during the summer of 2002, and CEC issued a vague commitment to “pursue . . . efforts in a complementary fashion”. By establishing a North American Air Working Group of their own to “facilitate future cooperative work on air related issues” they also pledged to “Make further progress toward a shared emissions inventory for electricity generating stations, a summary report of emissions, and an analysis of the availability and comparability of additional useful data by the end of 2004.”⁴⁹ Nevertheless, the next edition of “Energy Picture” will still not incorporate such environmental data; and by early 2004 it was only an occasional visionary on “the energy side” who would express an individual opinion that CEC representatives might actually be invited to participate in future NAEWG meetings.

Although some energy specialists still fear that differences in energy ownership patterns among the three countries will always block wholehearted international cooperation, I contend that these are likely to pose no more than temporary difficulties for NAEWG – although they are enough to make some coordination among the central governments of the three countries imperative. Canada and the United States are accustomed to appreciable percentages of government ownership and management within a “mix” of energy enterprises themselves, while the steady introduction of private investment and management in Mexico’s electricity sector (especially in new generation) is introducing a “mixed” energy economy to that country too.

⁴⁸ Joint Statement cited earlier (April 22, 2001).

⁴⁹ *Final Communiqué, Ninth Regular Session of the CEC Council, Ottawa, 19 June 2002.*

The strength of the NAEWG is that it institutionalizes dialog on energy matters among the three national parties. Its major weakness is that the persons who participate in most of its activities on behalf of their respective governments lack sufficient rank to provide it with much inherent authority. Thus, it stands poles apart from a body such as the International Joint Commission, which was established under the Boundary Waters Treaty of 1909 “to help prevent and resolve disputes, primarily those concerning water quantity and water quality along the boundary between Canada and the United States.” In the case of the IJC, “The Commissioners act as a single body seeking common solutions rather than as separate national delegates representing the positions of their governments” and “Commissioners represent only the Commission and not the government that has appointed them.”⁵⁰

Subnational Governments, NGOs, and the Effects of Federalism

The respective forms of federalism peculiar to each of the three countries are a source of dynamic tension within the continental gas and electricity regime. Despite President Fox’s political problems, central authority remains strongest in Mexico. It is weakest in Canada. In the United States, the dictum that “all politics is local” provides much of the explanation for the fact that this country continues to have policy attitudes and energy regulatory structures that differ remarkably from State to State.

During the 1990s, Robert L. Bradley, Jr., undertook the Herculean assignment of detailing the interactions of government at all levels with the U.S. oil and gas industry;

⁵⁰ International Joint Commission, *The International Joint Commission and the Boundary Waters Treaty of 1909*, Ottawa and Washington, September 1998.

and the result was a two-volume work totaling 1,997 pages.⁵¹ His study is invaluable for historical reference; but, even though it includes a separate appendix devoted to “Natural Gas Import-Export Regulation”, its main applicability to this dissertation boils down to a single paragraph:

Regulation. All fifty states have public utility commissions that have authority over domestic, commercial, and industrial sales of natural gas. Since the beginning of the industry, residential and commercial sales have come under local and state regulation; in 1947, regulation of direct sales from interstate pipelines to industrial customers was also found to be a state and local function. In addition, almost one-third of the 1,600 gas-distribution companies in the United States are government owned and operated.⁵²

Bradley adds in a footnote citation of the American Gas Association that, of all the states, Nebraska is the only one that does not regulate rates and service standards.

In electricity, the story is essentially the same. The classic *Energy Politics*, by David Howard Davis, represents a different genre from Bradley’s work; but a single sentence in it sums up a similar U.S. regulatory dilemma in respect to electricity:

“Because ownership varies among private, governmental and cooperative forms and because national, state and local levels share jurisdiction, regulation must match the complexity of the industry.”⁵³

For either natural gas or electricity within the United States, the basic principle is that bulk deliveries and sales (especially across State or national borders) lie generally in the jurisdiction of the federal government, while transfers on a smaller scale are more heavily influenced by State (and even municipal) authorities. But the boundaries (e.g., between “transmission” and “distribution” of electricity that flows at various voltages in

⁵¹ Robert L. Bradley, Jr., *Oil, Gas & Government: The U.S. Experience*, Rowman & Littlefield Publishers, Inc., Lanham, MD, 1996.

⁵² Bradley, p. 941.

⁵³ David Howard Davis, *Energy Politics* (second edition), St. Martin’s Press, New York, 1978, p. 171.

its journey from generator to household wall-plug) are ill-defined. It suffices here to note that supply, demand, and price functions are thus all bound to be affected by more than the underlying commodity and transportation costs. This is why sub-national officials (especially governors) must be counted as important “actors” within the continental regime. They also share responsibility (and power) when it comes to the siting of energy production facilities or the lines that deliver them – especially in terms of environmental effects, but also in connection with perceived issues of economic equity.

Federalism does not cut only one way. The influence of Governors and provincial premiers has been exercised both for and against continental interdependence in the energy field. Generally, officials representing States adjacent to the national borders have been quicker to recognize the mutual benefits of international cooperation, which explains why several groupings in particular should be cited by name:

- 1) The New England Governors and Eastern Canadian Premiers (NEG/ECP), convened in 1973 to explore solutions to the oil shortage at that time in the so-called Northeast International Region, and have been meeting ever since.
- 2) Western Canadian Premiers have participated in the annual meetings of the U.S. Western Governors Association for more than a decade; and in 2000 Western Governors attended the Western Premiers Conference, where it was agreed that the two groups would meet annually to discuss mutually agreed issues – including energy policy.
- 3) The Council of Great Lakes Governors, which was formed in 1983 to address “severe environmental and economic problems”, has had long

association with the International Joint Commission (see *supra*) and has recently been inviting the premiers of Québec and Ontario to attend its sessions.⁵⁴

- 4) Since 1980, the Border Governors Conference has brought together U.S. and Mexican Governors annually, alternating meeting sites between the two countries. Although their basic focus has been on non-energy topics, ranging from agriculture to tourism, their joint declaration in 2002 observed that “We must maintain a stable energy supply for the region” because “energy is a source of jobs and a means of generating wealth for the region, and is fundamental to its overall development.” It added an agenda item to “promote the development of an environmental strategy for new electrical generating plants in the border region with the goal of protecting air quality, and, where possible, conserving water resources in the region.”⁵⁵

These have all been binational bodies, but groundwork was laid in 1999 for at least indirect trinational cooperation, when a resolution was adopted by the Western body to join forces with the U.S.-Mexican Border Governors group. This provides a potential forum for discussion of trans-border issues (including energy) that might involve simultaneously the Governors of 16 U.S. mainland States, seven Canadian provincial Premiers, and the Governors of all six Mexican border states.

⁵⁴ David Massell, “Governors and Premiers Practice International Cooperation”, *Canadian Studies Update* (published by the Association for Canadian Studies in the United States, Washington DC), vol. 22, no. 1, Winter 2003.

⁵⁵ The joint declarations adopted by the Border Governors Conferences are available at <http://www.sos.state.tx.us/border/bmaconf.shtml>

Small permanent secretariats are maintained by these associations, each with its own website⁵⁶. A review of meeting summaries shows that there has been considerable discussion of energy matters.

- The energy committee of the NEG/ECP has tried to facilitate exchanges of statistics for energy supply and demand; and in the spring of 2002 it organized a major symposium in St. John, Newfoundland, that brought together energy leaders from both the public and private sectors. The parent group of governors and premiers has resolved to move toward “synchronization of energy-related regulations designed to foster growth while protecting the environment” across that international region⁵⁷, as well as encouraging investment in additional transmission connections.⁵⁸
- At their meeting May 1-2, 2002, the Western Governors first heard a trinational panel on the possibility of “a common vision on how to meet the energy needs of Western North America and the actions needed”, then a panel on “regulatory processes for energy projects”, and finally a series of case studies on cross-border energy projects. This came after the group had adopted an “energy policy roadmap for the region” and signed a “regional intergovernmental protocol to expedite the review of permits for interstate transmission lines.”
- Earlier (in June 1999), the Western Governors had adopted a body of eight principles in approaching environmental and natural resource management, which

⁵⁶ See <http://www.negc.org>, <http://www.westgov.org>, and <http://www.cglg.org>

⁵⁷ Resolution 27-4, adopted at the 27th Annual Conference of New England Governors & the Eastern Canadian Premiers, August 25-27, 2002.

⁵⁸ This is ironic, in view of the fact that some New England states have seen the most obstinate opposition to the installation of energy transmission lines.

they dubbed “Enlibra”. Based on suggestions that had come from hundreds of representatives of government, industry, agriculture, environmental groups and academia, the code includes such headings as “Solutions Transcend National Boundaries”, “Recognition of Costs and Benefits”, “Markets before Mandates”, and “National Standards, Neighborhood Solutions”.

Energy policy almost invariably involves measured tradeoffs; and this is why “governors and premiers” cannot be considered as a homogeneous category, whose interests and attitudes will always favor the constituents of energy interdependence. California and Texas are both part of the U.S. Western grouping⁵⁹; but their individual approaches to environmental regulation, regulatory restructuring for energy, and cross-border trade are quite different. They even contrast in the way their constitutions and traditions empower their chief executives to function: California’s governors can wield enormous personal strength; but the Texas counterparts are compelled to deal gingerly with a forceful legislature (and even, at times, with a uniquely powerful lieutenant governor who may sometimes actually be closer in sentiment to the State’s lawmakers).

The impulse of governors and premiers may be either centripetal or centrifugal, *vis a vis* either the central national government or the continental regime. Associations of governors within both the Western and Southeastern United States have been vociferous foes of FERC’s attempts to introduce Regional Transmission Organizations (RTOs) and a regional system of Standard Market Design (SMD) – although these reforms would

⁵⁹ As represented in NERC, Texas itself is divided among four of the 10 major North American reliability regions. About 85 percent of the state’s demand for electricity lies within the jurisdiction of ERCOT (Energy Reliability Council of Texas); but a small area in the extreme west (including the vital cross-border trading region around El Paso) shares membership with California in the Western Systems Coordinating Council (WSSC). A heterogeneous group of electricity suppliers in the northern “panhandle” of Texas belong to the Southwest Power Pool (SPP), and a sliver of southeast Texas is part of the Southeastern Electricity Reliability Council.

facilitate national and international trade in electricity. The complaints voiced most often are shaky ones that such changes could raise prices for power while delivering disproportionate benefits to utilities, independent generators, and consumers in other regions. But a strong underlying motivation is undoubtedly the famous unwillingness of both Southern and Western States to yield control to a higher echelon of government and administration. Such resistance was probably behind FERC's decision late in 2001 to establish a separate division "to coordinate outreach efforts with the states".⁶⁰

Governors in Mexico have been catspaws of the President for decades; but even in that country the outlook has been changed by the advent of multiparty rule and divided government.⁶¹ Although the Mexican states' taxing and regulatory powers are still severely limited, the governors are in a position (through patronage and personal popularity) to affect national elections, and their interests need to be regarded for that reason alone. More specifically, state and local permits invariably are required to build facilities and carry on operations associated with electricity; so a stubborn official in any city or state of Mexico may be able to delay progress. Perhaps as a result, the federal Energy Secretariat has pursued a series of regional meetings with governors to explain the aims of various reforms proposed by the Fox administration and the net benefits that might be expected in their respective areas if they should be undertaken.⁶²

As with governors and provincial premiers, national legislators in each country are often guided by ideological and regional interests that may affect their votes on

⁶⁰ FERC News Release, November 7, 2001 – "Commission Sets Direction for RTO Development; Regional Affairs Team to Bolster FERC/State Partnerships".

⁶¹ See "Mexico's political system: Redrawing the federal map", *The Economist*, March 29-April 4, 2003, p. 35.

⁶² Personal discussion with Armando Jimenez Vicente (then General Director for Policy in Mexico's Energy Secretariat), Mexico City, October 17, 2002.

energy issues. Party discipline can be looked upon as an additional, somewhat separate factor. It is strongest in Canada (because of its parliamentary system) and probably weakest in Mexico (which is new to true multi-party operation). U.S. Senators tend to show more individual independence in all respects than members of the House of Representatives, in part because the former have six-year rather than two-year terms and partly because they are elected from broader constituencies that may themselves be heterogeneous in outlook.

At any rate, federal legislators (and in some cases the committees on which they serve) must always be considered as potential agents of change within the continental energy regime. Because much of the regime's evolution is contingent on mutual understanding, tradeoffs, and cooperation among the three national partners, it would seem logical and beneficial for legislators in each country to swap views and to be perceptive of the variations in all three systems within which they are expressed. For this reason, regular bilateral conferences have long been held (U.S.-Canada, U.S.-Mexico, and Canada-Mexico). Oddly, however, no formal trilateral meeting of North American legislators has ever taken place -- although such get-togethers have been proposed. I was told by one participant in a 2002 bilateral legislative meetings attended by observers from the third country that the Mexicans were enthusiastic about such a prospect, the Canadians were dead-set in opposition, and those from the United States were "agnostic" on the question. This coincides with the informal and unscientific evaluation I have made in conversations with officials from the three countries.

Canada is about to launch what could be a fascinating experiment in federalist expression on the international stage. During his first visit to Washington as Prime

Minister, Paul Martin announced that a new “public advocacy and legislative secretariat” would begin operating at the Canadian Embassy in Washington during the fall of 2004. Provincial and territorial representatives will be located at the Embassy (and perhaps at some of the nearly two dozen consulates and trade offices Canada will have in the United States by that time) to “plan and support new outreach activities directed at members of the U.S. Congress – both on Capitol Hill and in their districts.” The Secretariat will be headed by Colin Robertson, a government careerist who has been Canada’s Consul General in Los Angeles. Robertson has also had some contact with the private sector in energy, having served in the mid-1980s as Manager of Corporate Relations and Public Affairs for Petro-Canada International Assistance Corporation.⁶³

Nongovernmental organizations (NGOs) exercise both direct and indirect influence over energy policies as implemented by governments. In some cases, groups with vastly different points of view (e.g., the Natural Resources Defense Council and Edison Electric Institute) may both contribute to the level of public debate by bringing facts to the attention of officials and the citizenry. On the other hand, a plethora of farm organizations may abet corporate interests (e.g., Archer Daniels Midland) in pushing subsidies for one particular energy product – corn-based ethanol – that makes no economic sense for consumers, promises illusory benefits to most grain farmers, and offers a surprisingly limited contribution to environmental protection or security of energy supply.⁶⁴ Still, considering the disproportionate effect that the early caucuses in

⁶³ “Prime Minister announces details of secretariat at Washington Embassy” (News Release from the Office of the Prime Minister, April 29, 2004).

⁶⁴ Aside from cost, the amount of ethanol that can practically be derived from corn is minuscule in relation to total motor-fuel use. Massive use of this fuel hinges on development of economical methods of converting much more common (and cheaper) cellulosic materials into ethanol; but this would end demand

Iowa sometimes have on U.S. presidential nominations, a single issue of this sort may ultimately have a domino effect on broader policy questions through the “horse-trading” that inevitably goes on.

A favorite ploy of both “public interest” NGOs and business/industrial lobbyists is resort to the judicial system. Most parties that feel aggrieved by energy policy can usually find a way to seek relief through legal suits. In the end, courts interpret laws and constitutions. Thus judges (many of whom essentially or actually serve for life in the United States) are also key players in the energy regime; and this contributes to both the stability and fragility of the continental system because of differences among the three countries. Precedent offers some assurance, but ideological leanings among jurists are not unknown; and the independence of courts has been challenged at various times – and for various reasons – in all three countries.

In the interest of brevity, this chapter has treated the executive branch of government in each instance as unitary. Chapter VII will look inside the black box (most especially within the United States) to explain by example that there is even more complexity in the way a regime of this type works in real life. Such a Rube Goldberg mechanism defies mathematical simulation; there are simply too many variables. Despite this, there are certain principles, norms, etc., that can be observed at any given moment; and some of them are suggested at the conclusion of this chapter. The very intricacy of the regime gives rise to its ability to change -- even though the interlocking factors, structures, and personalities involved lend mass and momentum to policies in place.

for corn (although perhaps create a modest market for cornstalks). The much-publicized Brazilian experiment with ethanol fuel for vehicles was instituted during a military dictatorship and has been almost impossible to reverse; but it wasted billions and involved duping poor farmers of what proved to be an unsuitable crop material to the eventual benefit of entrenched sugar interests.

Thus, the propensity to shift gears in policy may simultaneously be restricted by domestic inertia. That leads us to a short look at some of the regime's "intermestic" aspects.

Elements of the Regime Beyond North America

Even though the United States has not ratified the Kyoto Protocol and is unlikely to do so as it stands, peer pressures within the world community of nations to "do something" about the threat of global climate change arising from human activities make relationships with the Protocol an extra-continental element of the North American regime.

The production and use of fossil fuels inevitably releases carbon dioxide – the most prevalent of the so-called "global warming gases".⁶⁵ Thus, any meaningful effort to reduce emission of GWGs would affect the "way of life" in all three countries, because there are only a couple of basic approaches to limitation: 1) Reducing the consumption of fossil energy overall (either through curbing total demand or replacing fossil fuels with non-emitters – such as nuclear power, wind generators, and solar energy). 2) Shifting the energy mix to favor fuels that emit less CO₂ per unit of useful energy (burning natural gas gives off less than burning petroleum products such as gasoline and diesel fuel, and combustion of oil produces less carbon dioxide than coal). Popular-press "solutions" are all variations of these two; they include increasing energy efficiency, moving from centralized energy production to "distributed generation", relying on hydrogen (which must itself be produced somehow) to feed fuel cells, etc. International trading of emission credits might be coupled with various techniques for carbon sequestration that have been proposed to get around the two approaches mentioned here; but neither would be without

⁶⁵ Another is methane, which happens to be the principal constituent of natural gas.

cost, and they would still influence the way energy is used. In any case, there would be effects on the volume and/or “mix” of energy sources demanded – as well as on the nature of energy-consuming equipment in the residential, commercial, industrial and transport sectors.

Contrasting responses to the Kyoto Protocol in Canada, Mexico, and the United States plainly display the vagaries of federal systems:

- In **Canada**, opposition to Ottawa’s insistence on ratification was spearheaded by provinces that are themselves either fossil fuel producers (who resent curbs they foresee on profitable and revenue-yielding enterprises) or anxious net importers (who fear higher prices if energy must be produced under special restrictions or taxes). One of the few provinces that backed ratification was Québec, whose abundant and cheap hydropower is favored by any onus on fossil fuels. At any rate, squabbling over Kyoto between Prime Minister Chrétien and provincial leaders often exceeded the bounds of normal Canadian civility⁶⁶; and it has raised the question of whether or not the national government would be able to enforce compliance now that ratification by the cabinet (and nominally by Parliament) has taken place. The Chrétien government based its own authority (despite provincial control of energy resources in most circumstances) on the notion that an

⁶⁶ At one point, nine of Canada’s 10 provincial premiers had signed a letter to Chrétien, questioning the idea of ratification. The Prime Minister was embarrassed during a trade mission to Moscow when Alberta Premier Ralph Klein made the letter public at a “Team Canada” news conference – even though the Prime Minister had not yet received a copy. See Shawn McCarthy, “Premiers roast PM for pledge on Kyoto”, *The Globe and Mail*, p. A-1. Klein has been so spirited in espousing provincial interests (as opposed to expressed “national” energy policy) that he had his own environmental minister visit Russia to lobby that country against its possible ratification of the Kyoto Protocol – which would be required for the Protocol to go into effect.

international treaty has overriding, Constitutional force.⁶⁷ However, this opinion has yet to be tested; and Condon earlier cited several cases in warning that “The federal government has the power to enter into treaty obligations, but their implementation as domestic law must be consistent with the division of powers between the federal and provincial governments under the Canadian Constitution.”⁶⁸

- The split over Kyoto within the **United States** is partisan, functional, and regional; but the most barbed division between the state and national level has found the situation reversed from Canada’s. Here the Bush administration has been the opponent; the President announced that he had no intention of even submitting the Protocol to Congress (where it would have been defeated anyway). But, while Chrétien was doing his utmost to find a way to enforce its terms against the resistance of provincial premiers, the Attorneys General of three States (Massachusetts, Connecticut, and Maine) were threatening a formal court suit against the United States Environmental Protection Agency for failing to limit emissions of carbon dioxide.⁶⁹ On their own, oddly enough, the Eastern Canadian Premiers and New England Governors had earlier adopted a resolution committing the international region they represented to reduce the emissions of

⁶⁷ With its late start, Canada will almost certainly fall short of its Kyoto-prescribed target to reduce its average annual GWG emissions by six percent below 1990 levels by 2008-2012. If this occurs, public perceptions could be of a glass half-full or a glass half-empty. One of the original Kyoto negotiators (Ambassador Robert Reinstein) has told me that target percentages were not based on any scientific evaluation of feasibility, and at this point they are almost surely unrealistic for many countries. If admission of this fact produced general disillusionment, however, support for the Protocol itself could unravel.

⁶⁸ Condon, *op. cit.*, p. 286.

⁶⁹ Press Release from the Office of Attorney General Tom Reilly, January 30, 2003.

global warming gases to 1990 levels by 2010 (still not accommodating the Kyoto targets), and to cut them to 10 percent below that point by 2020.⁷⁰

- Although **Mexico** has earned admission to the “developed nations club” of the Organization for Economic Cooperation and Development (OECD), the language of the Protocol specifically exempts it (along with all “developing nations”), from the Kyoto targets for reduction of potentially “global warming” gases. Thus, “climate change” is much less of a topic of public debate there than in Canada and the United States; and it is unlikely to be a source of friction between the central and regional governments. On March 18, 2003, the governments of Mexico and the United States announced their intention to “expand and intensify their existing bilateral efforts to address climate change”; but a close reading of the joint statement⁷¹ suggests that these will continue to concentrate on what most people would consider peripheral aspects: determining emission inventories, looking at earth observation systems, constructing economic and climatic models, weighing approaches to carbon sequestration, and studying means of adaptation to climate change if it occurs.

Concerns about possible climate change are by no means the only global attitudes that have affected and will affect initiatives in continental energy cooperation. Price and supply volatility in the world oil market periodically raises questions related to economics and security; and natural gas and electricity are both alternatives to heavy

⁷⁰ “Eastern Premiers, U.S. Governors Sign ‘Historic’ Greenhouse Gas Deal”, *Edmonton Journal*, August 28, 2001. (See *Climate Change Action Plan 2001* at <http://www.cmp.ca> for text.)

⁷¹ “Joint Statement of Enhanced Bilateral Climate Change Cooperation Between the United States and Mexico”, March 18, 2003.

North American reliance on oil – which has perennially been subject to disturbances in the Middle East, Venezuela, Africa, and parts of the former Soviet Union.

For this reason, operations of the International Energy Agency (IEA) and the Organization of Petroleum Exporting Countries (OPEC) must be heeded closely. IEA was conceived originally as an offset to the OPEC “cartel”. It was to be a club (within OECD) of nations whose economic well-being could be affected adversely by OPEC’s quasi-monopolistic behavior – although IEA has become a mechanism for data collection and information exchange, as well as a means of institutionalized response to any energy market problem. Some members – such as the United States and Canada, as well as the United Kingdom and Norway – are themselves major hydrocarbon producers. Based in Paris, IEA has its own elaborate system of rules and consultations; and the organization has encouraged the development of strategic petroleum reserves in various member-countries that could be released in the event of international supply interruptions.

Mexico has flirted with the idea of joining IEA, but has not done so to date. Just as Mexico refused to accept the “proportionality” clause of the Canada-U.S. Free Trade Agreement as a part of NAFTA, it has been reluctant to agree to the IEA principle of “burden sharing” in case of oil shortages (presumably because this would subvert its decades-long dedication to the idea that its energy resources are the property of the Mexican people and of them alone.

Mexico has been ambivalent in its relationship to OPEC. From time to time since the mid-1990s, it has adjusted its domestic production of petroleum (which also controls its output of “associated” natural gas) in concert with OPEC’s periodic decisions to raise or lower member quotas as a means of keeping world oil prices within a target range. On

the other hand, Mexico has pointedly increased its output (and export) of oil unilaterally on some occasions as a gesture of solidarity with the United States (its primary customer) when there was a temporary threat to world supply.

It is therefore a “judgment call” as to whether OPEC and IEA might be considered part of the North American gas-and-electricity regime. I tend to think they are not, but ought to be labeled instead as a significant “external forces” – of the sort whose effects will be discussed in Chapter VIII.

Satisfying the Definition

This chapter has not been an exhaustive catalog of the regime’s makeup or its actual patterns of operation; nor did it need to be. The names of all the actors and the exact details of their interaction are not critical to this dissertation’s general conclusions: 1) that complex interdependence exists for the issue area of energy in North America; 2) that its basis lies mainly in what may fairly be called a “regime”; and 3) that the regime is still in a process of evolution that promises to continue indefinitely. That brings to the fore the questions of how this situation of North American energy interdependence came into being (Chapter V), why it didn’t (and couldn’t) emerge earlier (Chapter VI), and what will govern its future (Chapters VII and VIII).

This amorphous system -- the North American Gas and Electricity Regime -- satisfies the definition by Krasner with which this chapter opened. The reasonable and knowledgeable expectations of the heterogeneous collection of “actors” who deal with these two sources of energy within North America converge around the following:

Principles (a term Krasner defines as “beliefs of fact, causation, and rectitude”⁷²): Canada, Mexico, and the United States intend to maintain their individual sovereignty (although this term is subject to changing interpretations); but they recognise the value of increasing integration for the continental gas/electricity market. Movements of both gas and electricity across intervening borders are to be allowed with as few restrictions as feasible. In general, both commodities should be priced in accordance with “market realities”. Within Constitutional limits, cross-border investments in each other’s energy industry are to be encouraged. These are the basic principles of the regime as it stands today.

Admittedly, however, interdependence in such basic energy goods as natural gas and electricity is not an undiluted blessing. Even though “vulnerabilities” are demonstrably reduced, increased “sensitivities” may be troublesome in respect to the policy priorities of certain actors within the regime. Depending on circumstances, this could weaken (or at least modify) the regime through a perception by powerful interests within one or more of the three countries that the overall cost-benefit balance had shifted unduly. Some developments that conceivably could trigger such reactions include: 1) A large and apparently permanent rise in delivered gas prices; 2) Continuing failure by one national partner or another to encourage infrastructure development as needed for either gas or electricity; 3) Abandonment of natural gas as a major fuel for electricity generation; or 4) Surrender of a very large market-share in North America to LNG in preference to continentally produced gas. At present, all these are fairly remote possibilities; but if they occurred any change to the regime would ensue through effects

⁷² The definitions here are all taken from Krasner, *International Regimes*, p. 2.

on the “necessary and sufficient” factors to be treated at length in Chapter V. If the regime survived such a shock, it would probably be because the principles themselves had been reordered, in keeping with changes in policy (the formulation and implementation of which is treated in Chapter VII).

Norms (standards of behavior defined in terms of rights and obligations):

Although all have provisions through which the central government can exercise “eminent domain”, they agree that private property is not to be taken without appropriate compensation. Legal contracts are to be respected. Through the NAFTA side agreement on the environment, all three countries have pledged not to lower existing standards for its protection . . . and, indeed, to seek ways to minimize insults to the environment and to increase efficiency in energy production and use through trilateral cooperation. As relevant regulatory systems are established and operate, the three countries concur with the idea that their rules and rulings should be “transparent” rather than enacted and enforced arbitrarily; and all recognize the right to appeal such decisions through domestic judicial proceedings (where precedents are usually a powerful and reliable guide). Because energy is so important to the daily life, health, and economic welfare of society, however, authorities in each country retain the right to permit – and even introduce -- certain types of market distortion (e.g., temporary price controls, subsidies, etc.). There are no clear limits on such hurdles for the free interplay of supply and demand, but “peer pressure” within the regime is probably strong enough to insist that at least they be explained credibly on the basis of the public good.

Rules (specific prescriptions or proscriptions for action: These are legion within the North American energy industry, as has been pointed out. In addition to statutes and

regulations adopted individually, there are frequent Memoranda of Understanding (MOUs)⁷³ between and among the three national governments, and even subnational governments or departments and agencies. In respect to environmental ground rules within NAFTA, it has been observed that “With five levels of government authority (multilateral, regional, national, subnational, and municipal) the potential for harmonizing environmental regulations, or even agreeing upon minimum standards, is limited.”⁷⁴ The same applies generally to rules that govern energy activities. Although the latter are often not uniform among the three countries, however, their general codification (as the NAEWG is starting to accomplish for both gas and electricity) introduces a framework within which actions can be planned and undertaken with some confidence.

Decision-making Procedures (prevailing practices for making and implementing collective choice): The three heads of government meet with some regularity, with energy matters almost inevitably on the summit agendas. Ministerial meetings may precede these; and at any rate there are frequent contacts among the governmental leaders in each country charged with specific responsibilities for both energy and environmental matters.

The bilateral agreement between Mexico and the United States on climate change actions, mentioned above, cast a wider net:

Talks took place in Mexico City on 17 March 2003, between Dr. Harlan Watson, Senior Climate Negotiator and Special Representative, of the U.S. Department of State, and Mrs. Patricia Olamendi, Under Secretary for Global affairs of the Ministry

⁷³ On April 12, 2002, the energy ministers of Canada and Mexico signed a MOU to establish a general framework for cooperation in energy matters, including unspecified collaboration “between the national regulatory agencies of both Parties.”

⁷⁴ Debra J. Davidson and Ross E. Mitchell, “Environmental Challenges to International Trade”, in *NAFTA in the New Millennium* (Edward J. Chambers and Peter H. Smith, eds.) Center for U.S.-Mexican Studies, University of California, San Diego, 2002, p. 275.

of Foreign Affairs of Mexico, and other senior and technical officials of both governments.

Participating on the U.S. side were the Departments of Agriculture, \ Commerce/NOAA, Energy, and State, and the Agency for International Development and Environmental Protection Agency. The Mexican participants were representatives from the Foreign Affairs Ministry, the Environment and Natural Resources Ministry, the Energy Ministry, as well as from Pemex, the National Commission for Energy Conservation, universities and research Institutions.⁷⁵

Two items here are worthy of special comment: 1) that this statement was issued by the respective foreign ministries (rather than by the environmental and energy officials who took part) and 2) that the Mexican contingent included Pemex (although not CFE) and various non-governmental specialists.

There are numerous fora within which initiatives and changes to the rules of the regime have appeared; and others can be expected to arise. These include the CEC, the trilateral commission on labor practices set up under a separate NAFTA side-agreement, and the North American Electric Reliability Council. NERC will be especially influential if changes to U.S. legislation and companion changes in Canada and Mexico provide NERC (a non-governmental organization) with governmental means to enforce the decisions reached by its members.

On occasion, decisions are reached only through conflict resolution; and in this arena institutionalization of the regime is still far from complete. Certain disputes that have energy implications may be submitted to *ad hoc* panels that are constituted under Chapter 11 of NAFTA – as in the Methanex case.⁷⁶ Chapter 11 is unusual in that it allows

⁷⁵ Statement by Richard Boucher, Spokesman for the U.S. State Department, March 18, 2003.

⁷⁶ Methanex originally brought its complaint to the Commission for Environmental Cooperation, but CEC declined to follow up because it decided Chapter 11 jurisdiction was more appropriate. However, some environmentalist groups object to this venue on the grounds that Chapter 11 rulings are not open to adequate public scrutiny. See, for example, Justin Gerdes, “NAFTA’s Chapter 11 threatens the environment and democracy,” Environmental News Network, February 22, 2002 (available at <http://www.enn.com>).

private companies to bring suit against sovereign nations; and it is important that decisions reached by its arbitration tribunals are enforceable in domestic courts.

It is also remotely conceivable that disputes over energy subsidies (as in the case of U.S. Congressional proposals for a floor price on natural gas flowing through a pipeline along the route especially favored by Alaska – despite loud Canadian objections) would be subject to similar consideration under NAFTA’s Chapter 19. That provision of the Treaty deals with countervailing duties and antidumping actions.⁷⁷

Meanwhile, the North American Energy Working Group is pivotal. It is a continuing forum for discussion among the three countries’ respective energy ministries; and NAEWG is capable of bringing proposals to other departments and agencies (or to heads of government) that might trigger joint action on the part of all three countries). In this regard, NAEWG is slowly and still somewhat hesitantly assuming a specialized segment of the task Robert Pastor foresaw in 2001 for a “North American Commission” (NAC).⁷⁸

In discussions with Pastor and others I have characterized his NAC as a group of high-level “sherpas”, similar to those who come together on behalf of their respective governments to establish advance agendas for such meetings as the “G-7” summits on broad economic and related matters. Like the Nepalese guides who have become world famous for facilitating ascents of Mount Everest by expedition “principals”, an NAC (or NAEWG) proposes pathways to the final decisionmakers – who may follow or reject them. To use Pastor’s words, it “should also serve as a catalyst for the three countries to

⁷⁷ Authoritative brief summaries of NAFTA’s dispute settlement provisions -- including Chapter 11, Chapter 19, and Chapter 14 (which deals with financial services) -- can be found at <http://www.nafta-sec-alena.org/english/home.htm>

⁷⁸ Pastor, *Toward a North American Community*, pp. 100-102.

coordinate selected domestic, foreign, and trade policies.” By coincidence, NAEWG seems to have settled into the schedule Pastor envisioned – with full meetings at about six-month intervals. Similarly, it supervises sub-groups of its own; and it is certainly capable of beginning to “draft papers on ways to improve cooperation and facilitate integration”.

Pastor’s apparent preference for the composition of an NAC was that its top rank consist of “15 distinguished individuals, 5 of whom would be appointed by each of the leaders of the three countries, for a fixed term.” The second possibility he envisioned was “a private commission of distinguished individuals established under the auspices of nongovernmental institutes in the three countries.” The third alternative he mentioned would be “a classic intergovernmental organization (IGO), a group established by the three governments, managed by its civil servants’; and, in the long term, his book acknowledged that “this approach might be inevitable and desirable.” This is the format of NAEWG, and I believe it is the only one that will be politically attainable for some time to come.

To be sure, NAEWG still does not exercise the quasi-independent authority Pastor would like to see for his much broader NAC. I have even heard him describe the energy working group as “toothless”⁷⁹, while admitting its value as an intermediate step. Like the NAFTA Free Trade Commission, which Pastor scorns as a “virtual” structure, it has no permanent location or staff.⁸⁰ The important fact, however, is that NAEWG exists. By offering frequent, structured opportunities for what I have long termed “trialog” it could

⁷⁹ Discussion during a meeting of the permanent, trilateral North American Committee (sponsored by the National Policy Association) at the Monaco Hotel, Washington, DC, March 22, 2003.

⁸⁰ Pastor, *Toward a North American Community*, p. 73.

be a precursor of Pastor's far more ambitious vision. Meanwhile, it is extremely important within the gas-electricity regime.

Pastor's model appropriately involved the national legislatures (although he did not spell out exactly how they would fit into the work of the NAC); and the lack of any trilateral system of meetings for NAFTA's national legislators is perhaps the most serious gap in the decision-making system of the existing energy regime. When it is filled (as I am confident it will be), meetings will almost surely not be restricted to energy matters, but will be conferences of a North American Parliamentary Group (also urged by Pastor). This will be welcome, because the sets of bilateral legislative meetings which have been going on for some time have sometimes been useful in nurturing trade across the southern and northern U.S. borders, but are inadequate to foster an appreciation (and, ultimately, a realization) of full potential in an integrated gas-electricity system for North America.

Finally, to clarify the abstract definition further as a windup to this chapter, Krasner may be paraphrased as follows: By themselves, alterations of rules and decision-making procedures constitute a change within a regime. If norms and principles are altered, this should be considered a change of the regime. If and when the components of the regime lose coherence, or if behaviors cease to match the expectations on which the regime is based, that regime is weakened.⁸¹

Since I am equating the regime under study in North America with a reliable system of energy interdependence around which sundry actors' expectations converge, a logical follow-on question is "How did all this come to be?" That is the subject of the next chapter.

⁸¹ Krasner, pp. 2-5.

V. NECESSARY AND SUFFICIENT FACTORS FOR ENERGY INTERDEPENDENCE

The preceding chapters have explained what energy interdependence in North America involves; and they have described the gas-electricity regime that continues to shape energy relationships among the three countries. It is time to examine causal factors.

Once four necessary elements that support continental gas-and-electricity interdependence were simultaneously in place . . .

- lowered barriers to movement of gas and electricity across the international borders
- the possibility of significant competition among suppliers
- technical means of comparing potential sources and choosing among them rapidly, and
- the opportunity to benefit by interchanges among gas, electricity, and delivery capacity as requirements fluctuate . . .

this was sufficient to bring into being a regime that is responsive to “intermestic” conditions as they are perceived and acted upon by the full lineup of “players” involved.

Reducing Barriers at the Borders: Stage One

When exchanges of gas and electricity are subject to either duties or non-tariff barriers of any kind, this perpetuates uncertainty about future marketing economics. Uncertainty, in turn, raises the perception of risk; it discourages the huge capital investments needed to construct the broad infrastructure of pipes and powerlines across international borders that may approach an ideal trading network for all concerned. Until

many of the traditional barriers were lowered in North America, energy interdependence remained relatively weak; and there was little incentive for a comprehensive specialized regime to develop. Thus, firm national commitments to broadly free movement of both gas and electricity across borders on a continuing basis were a necessary factor. These came in separate stages, the first of which was only bilateral.

The history of Canada's inward-looking 1980 National Energy Program (NEP)¹, the U.S. record of nationalistic quota systems on energy imports after World War II², and Mexico's long-standing distrust of foreign designs on its natural resources (evidenced in the failed 1977-1978 gas negotiations that will be discussed in Chapter VI) made the quick-paced events of 1985-1993 all the more amazing in the way they led to broad trilateral energy trade and virtually guaranteed that it would stay open.

As Chapter IV of this dissertation has made clear, NAFTA's provisions, institutions, and side agreements are part of the foundation of the trilateral North American gas-and-electricity regime; but a bilateral agreement for free trade between Canada and the United States preceded it by several years – establishing some telling principles, norms, and rules that persist. This Canadian-U.S. Free Trade Agreement itself was prefigured by an exchange of letters between President Ronald Reagan and Prime

¹ Eric M. Uslaner summarizes the NEP's provisions and discusses some of the politics associated with it in his *Shale Barrel Politics: Energy and Legislative Leadership*, Stanford University Press, Stanford, 1989, pp. 164-196.

² Bradley (*op. cit.*, pp. 726-765) describes various efforts at U.S. protectionism and preferential treatment for domestic oil producers between 1950 and 1973, including tariffs, quotas, and disguised tariffs termed "license fees". Davis (*op. cit.*, pp. 67-91) treats the same period, with more emphasis on political pressures brought by the industry. It is interesting that Canada generally got special treatment because overland delivery was considered more secure; but the underlying motivation was to keep "cheap foreign oil" from undercutting the U.S. oil industry that had once dominated world trade in addition to supplying domestic requirements.

Minister Brian Mulroney on October 1, 1985; it was signed on January 2, 1988; and it became effective a year after that.

The timing was right³. In campaigning for his first term, Reagan had briefly surfaced the idea of a free trade agreement to link his own country, Canada, and Mexico; but such a move would not have been feasible politically at that time because of nationalist resistance within the prospective partner nations and strong protectionist inclinations among some of Reagan's influential industrial backers. Mulroney himself had campaigned earlier against free trade negotiations⁴, although he moved quickly after becoming prime minister to dismantle NEP.

Canada's National Energy Policy had been a xenophobic complex of regulations that purported to protect Canadian "energy independence" but served in fact to guarantee cheap energy for population centers of the East (where Federal political activity has also been centered). Its interventionist role to hold consumer prices down artificially came at the expense of producer interests in the West -- who were willing to profit from higher international petroleum prices, especially if they happened to accompany an expansion in export opportunities.

By 1985, both leaders saw advantages from "locking in" the market openings that had newly appeared for many products and services. Mulroney was especially concerned about a threat by some members of the U.S. Congress to impose a 10 percent surcharge on all imports from all countries -- which would have been especially hurtful to Canada because of its overwhelming reliance on the U.S. market. Although the surcharge stood

³Charles F. Doran, "Canadian Relations with the United States", *Current History*, March 1988, p. 97ff. In Doran's words, "The United States wanted to obtain national treatment for investment just as Canada sought national treatment for trade."

⁴Doran, *loc. cit* (p. 97).

little chance of being adopted, it is not unusual for foreign leaders to overreact to Congressional discussion. And perceptions are important.

Scores of books and articles have been written about the origins of the U.S.-Canada accord⁵, so it is surprising that the behind-the-scenes role of energy in its actual negotiation has not been treated adequately in published accounts. The lead negotiators on energy for the two sides, Robert Reinstein for the United States and Canada's John Donaghy⁶, agreed at their very first meeting that "the freest possible trade in energy was the best"; and (according to another active U.S. participant, David Pumphrey) the entire energy chapter of the CUSFTA was so structured as to "raise the threshold of pain" for anybody who tried to move back toward NEP in Canada or to return to a "command and control" energy policy in the United States.

My own insight into the negotiations and the intent of the U.S. team is based additionally on interviews with Reinstein during April 1993 and with Pumphrey (now a Deputy Assistant Secretary of Energy who has been closely associated with the activities of the North American Energy Working Group) on April 29, 1993.

Originally, neither country had anticipated a separate chapter devoted to energy. In fact, the Macdonald Commission had "expressed caution about any open inclusion of

⁵ For a concise yet fairly thorough summary, see Donald Barry's essay on "The Road to NAFTA", in Barry (ed.), *Toward a North American Community?* Westview Press, Boulder, 1995. For greater detail about the actual negotiations (although still without appropriate acknowledgement of the energy discussions that set an importantly ambitious tone), see G. Bruce Doern and Brian W. Tomlin, *Faith and Fear: The Free Trade Story*, Stoddart, Toronto (1991). A useful chronology of the FTA talks and related events was issued by the Canadian Press Association on December 3, 1988. I had access to it through the clipping file of the Canadian Embassy in Washington. Rich detail is also provided by a series of Kennedy School Case Studies assembled as "US-Canada Free Trade Negotiations".

⁶ Donaghy represented the Canadian Trade Negotiations Office (TNO, Reinstein the staff of the U.S. Trade Representative (USTR).

services, agriculture, energy or culture⁷;" and Simon Reisman (Canada's chief negotiator in the talks) was reluctant at first even to permit an energy working group -- preferring to control this issue in plenary negotiations.⁸ Although originally designated only to carry out a "fact-finding" mission, Reinstein and Donaghy resolved quickly to search for detailed text that "specifically guarded against a return on either side to the restrictive practices of the past." For example, they would hammer out agreement on how obligations under the General Agreement on Tariffs and Trade (GATT) should be interpreted in respect to energy.

The energy section of the CUSFTA (Chapter 9) turned out to have totally unanticipated significance, because it became the model for that same Agreement's Chapter 4, which covers commodity trade in general. Except that the words "energy good" are replaced by "goods" and the references to relevant annexes are adjusted, Article 407 ("Import and Export Restrictions") mimics Article 902. The wording of Article 904 was lifted to constitute nearly all of Article 409 ("Other Export Measures"). Article 408 on "Export Taxes" uses language identical to that in Article 903.⁹

Clayton Yuetter (the U.S. Trade Representative at the time) eventually called the energy chapter "the jewel of the agreement"; and the usually dour Reisman said it was one of the two chapters in which he took the greatest pride.¹⁰ According to William F. Martin, a clear (but largely unpublicized) aim of the United States from the outset had

⁷ Doern & Tomlin, p. 56.

⁸ Doern & Tomlin, p. 158.

⁹ The full text of the Agreement is available in various published forms. The source used in this research was issued by Canada's Department of External Affairs late in 1987 with the title *The Canada-U.S. Free Trade Agreement – Trade: Securing Canada's Future*.

¹⁰ David Leyton-Brown, "Implementing the Agreement", in *Making Free Trade Work: The Canada-U.S. Agreement* (Peter Morici, ed.), Council on Foreign Relations Press, New York, p. 50. Reisman's other favorite was the chapter on automotive goods.

been to eliminate virtually all barriers to its energy trade with Canada -- which was already substantial, as we shall see again in Chapter VI, and whose potential augmentation many Canadians contemplated as mutually beneficial (despite political sensitivities which eventually entered the public debate). Martin was present as a Special Assistant to Reagan during the “Shamrock Summit” with Mulroney in March 1985 (when the latter first broached the subject of a comprehensive FTA) and he participated later in closed-door sessions during the late summer and fall of 1987 in Washington, where U.S. Treasury Secretary James A. Baker III focused on the energy chapter in pressing ahead to salvage the entire agreement just before a “fast track” deadline that could have closed off the talks without success.¹¹ By that time, Martin had become Deputy Secretary of Energy; and my interviews with him on April 22 and May 5, 1993, contributed greatly to an understanding and analysis of the national political situation *vis a vis* the negotiations – which is reflected in Chapter VII.

Martin knows firsthand that Baker had plunged the U.S. Economic Policy Council into several full-fledged discussions of the evolving energy chapter during the summer of 1987. The EPC consisted of cabinet-level officials; but, more often than not, Martin filled in as Secretary John Harrington’s Deputy . . . so he is familiar with what went on. During the final weeks of negotiation, Martin says the U.S. team got all its guidance from the powerful EPC.

¹¹ Both Canada and the United States wished to use the procedure in U.S. law that compelled Congress to act quickly on the international agreement submitted to it and to vote it up or down without amendment. The expiration of such “fast track authority” (or, as the second Bush administration renamed it during its campaign for reinstatement, “trade promotion authority”) later delayed the U.S.-Chilean Free Trade Agreement for years.

Although Doern and Tomlin devoted an entire chapter of their work to the final hectic weekend of negotiation in Washington, it does not even mention energy! Earlier in that book, however, they were probably right on target in suggesting that both sides kept a low public profile on energy as long as they could to avoid arousing controversy.¹² Once U.S. officials following the negotiation realized that the guarantee of a reliable, nearby source of energy could be a good "selling point" for FTA as a whole (assuming that regional interests in some measure of protection could be placated), attitudes changed and they decided that energy might be showcased in a chapter of its own. The Canadians, perhaps grateful that fruitful two-way communication was being established in any area, acquiesced.

Donaghy and Reinstein each knew quite a bit about the energy field (which might not have been the case in such a negotiation); and they quickly learned that each had been philosophically troubled and practically disappointed by his own country's earlier efforts to control domestic and international energy markets. They were both convinced that government micromanagement of energy development was a sure path to inefficiency. In this country, price controls had boosted energy demand artificially, while stifling some marginal energy production that might otherwise have taken place. Canada's economy would profit if the country's remaining untapped energy resources were nurtured and managed effectively by free-enterprise specialists . . . and this might be encouraged by the enormous assembly of potential customers for energy in the United States.

¹² Doern & Tomlin, p. 122 and p. 134.

During the late 1980's the bilateral energy trade fluctuated between \$10 billion and \$14 billion -- roughly 10 percent of all two-way commerce in goods.¹³ In fact, Canada was this country's largest energy supplier -- sometimes providing more than \$6 billion in oil and petroleum products a year at that time, as well as another \$2.5 billion in natural gas, about \$1.25 billion in electricity, and the overwhelming majority of all U.S. uranium imports. Canadian oil imports were particularly vital to some small, "land-locked" U.S. refineries with no ready alternative sources of crude. On the other hand, Canada got almost all its coal from the United States -- buying about \$1 billion worth annually, including both metallurgical coal and the steam coal used to generate electricity. Some electricity also flowed northward to Canada, in areas where geography and resource availability made that practical and economical.

The two energy negotiators played out what each recognized as a positive-sum game on their own mini-stage of bargaining, yet they were not acting as free agents. "My view had been cleared" [by USTR], Reinstein explained to me. Given the bureaucratic, hierarchical structure on the Canadian side, it seems likely that Donaghy was also operating within pre-approved guidelines -- even in their first "get acquainted session". Recognizing the historic and projected patterns of bilateral trade, the basic goal would be to secure "national treatment" in both countries for Canadian energy suppliers and U.S. energy purchasers -- which meant their consideration of barriers would have to go far beyond tariffs alone.

According to Pumphrey (who had been assigned by the U.S. Department of Energy to assist Reinstein), the objective was to "raise the hurdle for any future

¹³ Shelly P. Battram and Reinier H.J.H. Lock, "The Canadian/United States Free Trade Agreement and Trade in Energy," *The Energy Law Journal* (1988), p. 14.

government if it wanted to restrict exports or imports." From the U.S. standpoint, for instance, a key outcome under the non-discrimination guideline would be to prevent Canada from ever again charging more for the energy it sold to this country than its own citizens had to pay for the same products. As the energy negotiators moved from "formula" to "detail", however, some specific tradeoffs had to be made. Canada promised to eliminate one of three "price tests" on exports of electricity that had made it possible to charge U.S. buyers more than Canadian customers paid, but only if the Bonneville Power Administration (a huge Federal complex of electricity generation and marketing that serves the U.S. Northwest) granted British Columbia Hydro the same access to its transmission network that was available to neighboring U.S. systems. BPA (which is part of the U.S. Department of Energy) opposed the idea vigorously, and Pumphrey says the negotiations that went on within his own agency were more difficult than any between the two national teams. Ultimately, the deal (which was essential if Canadian electricity was to become readily available for sale into the U.S. hinterland) was written into Annex 905.2 of the FTA -- in language that made it clear Bonneville had to comply.

Another compromise came in Annex 902.5, giving partially processed Canadian uranium access to the United States without any quota, but changing Canada's domestic rules so that the uranium compound would enter in a form that would require additional chemical conversion in this country before the material could be "enriched" in its fissile component. For the U.S. side, Reinstein admits that "the uranium people lost" overall; but by that time the domestic uranium mining and processing industry already appeared to be in an inevitable terminal decline, despite protectionist efforts, and "somebody had to

lose." The free trade swap in the interest of efficiency did not hurt nuclear power development in either country

In the crucial area of supply guarantees, the cooperative impulses toward "national treatment" were tested when the United States team proposed "proportionality" as a pledge that the new, stronger, binational "energy community" would stick together even in hard times that the future might bring. If circumstances ever compelled either party to restrict the volume of any energy good it was exporting to the other, it still agreed not to cut back the fraction of its total domestic supply of that good to less than the average it had made available to its FTA partner during the preceding three years for which data were available. A narrow definition for a "national security exception" was written into CUSFTA (also by U.S. initiative), producing a powerful yet credible energy bond indeed.

At key stages, Martin often pushed Reinstein and Pumphrey back into rewriting -- "until he felt comfortable," according to Pumphrey. Yet Martin recognized the importance of pinning down the long-term availability of Canadian oil, gas, and electricity under realistic market pricing. According to Martin, Treasury Secretary Baker felt that stable energy prices were even more of a concern than supply volumes by themselves -- a point that was brought to Congressional and public attention by a report to the President on "Energy Security" Martin was entrusted to spearhead. Stable prices protected consumers from energy shocks, and they were arguably in the best long-term interest of producers as well -- making the entire deal politically salable.

The melodramatic conclusion to the FTA negotiations came on Saturday, October 3, 1987 -- with agreement reached only minutes before midnight. The last hangup

concerned the composition, powers and procedures of a binational review panel to resolve disputes.

Ratification was not easy in either country. Reinstein had to testify at 16 Congressional hearings within less than nine months. The toughest ordeal came for him (and Martin and Yuetter) on April 19, 1988, in a three-and-a-half-hour session before the Senate Committee on Energy and Natural Resources. Only Senators opposing the FTA energy chapter showed up. Afterwards, Yuetter called it the worst such session he had ever experienced; and Martin agrees. Mulroney risked his mandate by making ratification a general election issue. He won . . . and so did both countries.¹⁴

Reducing Barriers at the Borders: Stage Two

Once Mexico was also brought into the North American free trade picture through negotiations on NAFTA, the index of political sensitivity rose higher than ever. The Mexican delegation felt it necessary to state repeatedly in public that energy was “off the table” – i.e., not subject to negotiation in any way. A deputy energy minister was fired when he merely implied that oil might be discussed.¹⁵ Yet Hermann von Bertrab, who coordinated the Washington office of the Mexican negotiating team, explained in his

¹⁴ Not everybody agreed – during negotiations, in the ratification debate, or to this day. For example, see John Dillon, “Continental Energy Policy” in *The Free Trade Deal*, James Lorimer and Company (Duncan Cameron, ed.), Toronto, 1988, pp. 104-116. One part of Dillon’s essay bears the subhead “Surrendering Control over Canadian Resources”, and it concludes with a warning that “Only made-in-Canada prices will enable us to achieve energy security, responsible energy stewardship, and diversified economic development in every part of Canada.” The books and articles of Stephen Clarkson, of the University of Toronto, also continue to condemn U.S. motives in CUSFTA and NAFTA . . . and to bemoan the threats of free-market energy to national sovereignty and environmental protection.

¹⁵ William A. Orme, Jr., *Understanding NAFTA: Mexico, Free Trade, and the New North America*, University of Texas Press, Austin, p. 139.

book-length survey of the process that “From the beginning of the negotiations, the energy sector was paradoxically both conspicuously absent and permanently present.”¹⁶

William Orme, a keen and thoughtful observer of NAFTA, has explained that this was possible because the United States and Mexico were each able to achieve a major energy-related goal (easier access to oil and to hard currency, respectively¹⁷) without ever raising constitutional questions such as who “owns” Mexican oil resources and whether Pemex should (or could) be privatized. “Under NAFTA,” he wrote, “there will be a permanent legal and investment framework for integrating Mexico into the U.S.-Canadian energy grid.” [emphasis added] He reasoned further that liberalization of the Mexican financial sector as a consequence of the treaty should automatically improve Mexico’s international credit rating. In his opinion, this would enable Pemex to raise the capital it needs for resource development by selling petro-bonds on the world market that would be roughly comparable to the capital finance issues of private oil companies.

Unfortunately, Pemex is constrained in several ways from following normal business practices. It is allowed to issue such bonds only to the extent authorized each year by the Mexican Congress, which has customarily held a tight leash. Nor may Pemex decide for itself how to reinvest the considerable revenue it receives each year in maintenance, modernization, and additional exploration and field development. It must surrender its receipts to the general treasury and get by on whatever the national budget allocates for such purposes. Without tax reforms that its Congress has repeatedly refused to enact, however, the Mexican government depends on Pemex for too large a share of its

¹⁶ Hermann von Bertrab, *Negotiating NAFTA: A Mexican Envoy’s Account*, Praeger (Westport, Connecticut) and the Center for Strategic and International Studies (Washington), 1997, p. 58.

¹⁷ During a faculty seminar at American University on March 26, 2003, the Political Affairs Minister from the Mexican Embassy in Washington, Carlos Rico F., made precisely the same point.

income to let go of this “cash cow”. This also makes Mexico’s entire federal budget-planning process a guessing game, since so much depends on government projections of world oil prices for each upcoming fiscal year.

Having largely resolved its energy relationship with its major customer (the United States) via their earlier bilateral free trade agreement, Canada was not especially concerned with the discreet maneuvering on energy that accompanied the NAFTA talks. In agreeing to join a trilateral partnership, however, Mexico renounced ceilings on the volume of crude oil sales it would permit to its big northern neighbor. It also gave up the practice of export taxes on petroleum – in return for a U.S. commitment to exempt its treaty partners from any future oil import taxes of its own, such as those that earlier administrations and Congresses had felt were necessary to protect domestic producers. NAFTA’s procurement rules were intended to phase out restrictions on American subcontracting, thus benefiting both U.S. and Canadian firms while allowing Pemex to spend its development money much more efficiently – assuming that the notorious corruption of the parastatal bureaucracy and its labor constituency could be replaced with honest and transparent operations.¹⁸

Unlike many authors, Orme foresaw the significance of trade in both gas and electricity. He projected first that “energy-starved northern Mexico” would become “a leading net importer” for natural gas. As for electricity, he mentioned a second, complex, and expensive stage, in which he saw that country “gradually becoming a net exporter for the continent as a whole.”¹⁹ Perhaps he was overly optimistic, at least in respect to the time-frame he seemed to imply; but this is excusable. Except for a fresh introduction

¹⁸ See Orme, *Understanding NAFTA*, pp. 139-145, for a slightly different exposition of the same facts.

¹⁹ Orme, *Understanding NAFTA*, pp. 144-145.

prepared in July, 1995, Orme's 1996 book did not take into account the political upset and peso crisis that was to follow so closely the inauguration of NAFTA at the beginning of 1994. Obviously, nobody then could have predicted the changes in 2000 that I treated in Chapter IV either. Yet any fair and comprehensive survey of NAFTA (written contemporaneously, today, or in the future) is sure to reveal that this treaty was necessary for continental energy interdependence.

Commentators who express disappointment at NAFTA's limitations in respect to energy were probably expecting too much from the treaty itself. There is anecdotal evidence that Mexico's negotiators would have "gone farther" if pressed; but -- given Mexico's history -- there was hardly any question that the government would refuse to accept "proportionality" as a dictum in facing possible energy shortages in the future. The more significant factor in evaluating NAFTA on this point is that Canada and the United States did not use Mexico's intransigence on the issue as an excuse to back away from the bilateral pledge they had made. NAFTA built upon CUSFTA. And the very fact that a trilateral agreement was in prospect encouraged Mexico to reaffirm and expand on steps outside the treaty itself that would also reduce energy trade barriers.

Freeing up trade in gas and electricity for Mexico has been a complex assignment, yet amazing progress was made during the years immediately before, during, and after the NAFTA negotiations.²⁰ In effect, President Salinas had redefined Mexico's

²⁰ The U.S. Congressional Budget Office's unemotional advance dissection of NAFTA's energy provisions is worth reviewing as a reminder of where "outsiders" stood in relation to Mexico's energy industry prior to the trilateral trade agreement . . . and thus how much progress the new openings signified. In its July 1993 *Budgetary and Economic Analysis of the North American Free Trade Agreement*, CBO explained that "the agreement would ease restrictions on the export to Mexico of natural gas and basic petrochemicals, allow investments in secondary petrochemical production and in certain types of business that generate electricity, protect those investments from discriminatory treatment, and open the market for contract services with the Mexican government's energy monopolies." (p. 45)

constitution in December 1992 when he pushed through amendments to the Public Electricity Service Act. This permitted him to announce that certain types of small-scale generation of electricity would no longer be “considered public service” (and thus exclusively a government prerogative). The constitutionality of this interpretation has since been challenged; but the fact remains that numerous power plants have been built in Mexico by private investors since then under a variety of arrangements, and it is hardly conceivable that any future President could tolerate a reversal that would be viewed now as expropriation of existing facilities. A similar transformation took place in respect to natural gas in April 1995, when Salinas’ successor (President Zedillo) reaffirmed the constitutional guarantee of Mexican national sovereignty over all hydrocarbons but explained that it was in the national interest to permit private (and even foreign) participation in non-strategic activities (gas transport, storage, and local distribution) that would make Mexico’s patrimony in natural gas even more valuable and more accessible to its people. Most importantly, Mexico had created in 1993-4 a body distinct from Pemex and *CFE* to oversee the implementation of these new ground-rules -- the *Comisión Reguladora de Energía*. And when *CRE* was upgraded in October 1995 from the status of a consultative group within the Energy Ministry to that of an autonomous agency with independent enforcement authority the fundamental reforms needed to facilitate cross-border gas and electricity trade were complete.²¹

Pemex still controls the development and production of natural gas within Mexico, as well as the great bulk of that fuel’s sales throughout the country. The federal electricity parastatals still control the grid and are parties to all commercial power

²¹ *Energy Picture*, pp. 48-54. See also Dukert, “The Evolution of the North American Energy Market”, pp. 11-15 and p. 28.

transactions. But private imports and exports of both energy sources are now permissible; and these are the bases of international interdependence. Pemex and *CFE* are obviously the dominant energy “players” in Mexico; but the most troublesome of the traditional legal barriers to continental energy trade have fallen. Thanks to NAFTA’s incorporation of CUSFTA rules, electricity is treated as a commodity. By now, energy tariffs within NAFTA have been phased out completely.

The temporary snag in Mexico’s removal of the last remnants of its import duty on natural gas in 1999 (ahead of the NAFTA schedule) showed how necessary the factor of lowered tariffs was. One highly significant project to deliver U.S. gas via an “open access” pipeline to the Monterrey area for use in generating electricity was suspended instantly when it appeared that the final removal of import duties on gas would be delayed. As soon as the precipitating dispute was resolved, engineering work on the pipeline resumed.²²

NAFTA provided for the gradual elimination of tariffs on natural gas; but it was preceded by a unilateral U.S. action that was of roughly equal importance – namely, passage of the Energy Policy Act of 1992.²³ Oddly, two sections of this legislation that were barely noticed at the time of enactment – even by the legislators themselves²⁴ -- would prove to have far-reaching effects into the future. One was the elimination of a requirement for advance approval from the U.S. Department of Energy in order to engage in cross-border gas trade. The other was the authorization of “exempt wholesale

²² Dukert, *The Evolution of the North American Energy Market*, pp. 10-11.

²³ This is not to say that there have not been other milestones (before and after 1992, in all three countries) that are worthy of mention in tracing North America’s path toward integration of the traditionally individual gas and electricity markets. For a side-by-side selection, see the table at the end of this section.

²⁴ Former Congressman Phil Sharp, who was one of the chief architects of the legislation, has admitted this in numerous public and private discussions.

generators” of electricity, which could produce and market bulk power on a competitive basis – letting its price be determined generally by supply and demand rather than the cost of generation plus what regulators stipulated to be an adequate return on investment. Coupled with other changes that would be made subsequently via NAFTA and by independent actions within both Canada and Mexico, this meant that generators of electricity anywhere in North America could extend their market horizons to continental dimensions. Obviously, there would be technical limitations . . . not to mention objections to specific production or transport facilities that might be required, based on the NIMBY reaction (Not In My Back Yard). But all such complications only serve to underline the value of creating a regime – especially one that can gradually build a record of effective dispute resolution and cooperation.

NAFTA remains a necessary part of the regime being explored here. Accession to it by the three countries has imposed predictable constraints on decisionmaking in respect to energy. In fact, the possibility of sanctions under the treaty provides a certain enforcement mechanism. Within the regime, free trade in energy is thus acknowledged as an ideal to be pursued and protected. Without this principle, energy interdependence could have been a transitory phenomenon, subject to collapse with relative ease.

Yet NAFTA – or even dedication to relatively free trade within the triad -- is not itself the whole regime. Membership²⁵ in the trade agreement alone did not make gas-and-electricity interdependence inevitable, much less compel the intimate trilateral energy relationship that has developed and continues to expand. A handful of links that

²⁵ Arthur Stein argues against considering the United Nations a regime because (he writes) mere membership in the UN “in no way constrains independent decisionmaking” and “membership generates no convergent expectations that constrain and shape subsequent actions. Cf Stein, Arthur A., “Coordination and collaboration: regimes in an anarchic world”, in Krasner, pp. 133-4.

reached barely across the borders and were unable to stretch into the hinterland would not have created the deep, rich, and (importantly) heterogeneous but unified energy market that fosters trade optimization. That required other types of barriers to fall. For instance, domestic competition had to be nurtured and a variety of compatible, mutually reinforcing regulatory developments had to take place. This process was in its early stages as NAFTA was coming into existence; and it has followed a zig-zag trail since then.

The following chronological table matches up some of those developments within each country. It focuses on the period between the break-off of the 1977 gas negotiations between Mexico and the United States (an event treated in great detail by Chapter VI) and several events that interrupted the underlying positive trend, starting in 2000 (as noted earlier in this work).

The table exemplifies the interplay of actions at the federal and the state/provincial level in Canada and the United States. It also points up the fact that market evolution has taken place more hesitantly overall in Mexico.

Table 4 Gas & Power Regulatory Highlights -- A North American Time Line			
	CANADA	MEXICO	UNITED STATES
1978	Agreement reached during visit by Vice President Mondale for bilateral feasibility study on increased exchanges of electricity. NEB launches reevaluation of procedures for authorizing exports of "surplus" natural gas.	Government insists that it will develop natural gas resources exclusively for domestic use.	PURPA ends U.S. utilities' monopoly in generation of electricity by requiring utilities to buy third-party power at an administratively set price. NGPA targets eventual gas price decontrol. DOE is authorized to issue permits for cross-border gas and power delivery systems. (But Fuel Use Act forbids gas as a U.S. generating fuel.)
1979	Gauging current reserves, plus current & future gas deliverability, NEB finds ample "surplus" to meet exports authorized through 1992.	Agreement reached for some gas exports to U.S., with compromise price to escalate on the basis of a "basket" of 5 crude oils.	Presidential candidate Ronald Reagan proposes a North American agreement for free movement of people & goods, specifically citing energy. DOE policy formally favors Canadian/Mexican gas pipeline imports over LNG.
1980	National Energy Program tries to shift consumption from oil to gas by price adjustments. Conclusions of binational study with U.S. favor more power trade, urge reduction of regulatory barriers.		Pacific Northwest Electric Power & Conservation Act establishes regional regulation and planning.
1981	Federal-provincial agreements modify gas price controls as internal battle rages over NEP.	Seasonal exchange of electricity at high voltage begins between geothermal facility in Baja California and San Diego G&E.	PURPA ruled unconstitutional by Federal judge in Mississippi, but decision is reversed a year later.
1982	Supreme Court rejects federal tax on exports of gas from provincially owned wells. NEB issues first export license for nuclear-based electricity.		Recession depresses demand for gas, combines with excess supply (growing out of higher prices earlier) to create "gas bubble".

1983	Loosening of gas price controls and the ties of export levels to domestic "surpluses" aims at increasing exports to U.S.		FERC Order 380 paves way for utilities to buy gas directly from producers & marketers.
1984	Policy change allows gas exporters to negotiate market-based pricing & delivery terms. NEP ends. New government foresees energy as engine of growth, with exports from James Bay Hydro.	Gas exports to U.S. ended as market tightens and Canadian export prices fall.	Market-oriented policies adopted for natural gas trade with Canada (bringing some complaints from Canadian producers).
1985	Federal government and some producing provinces agree to deregulate oil & gas prices (but not to go below wholesale prices for Eastern Canada).	CFE becomes a member of NERC's Western Systems Coordinating Council.	DOE Secretary Hodel urges comprehensive decontrol of natural gas prices, but is rebuffed by Congress. Order 436 offers some benefits to pipelines volunteering to offer services more flexibly.
1986	"Western Accord" and "Halloween Agreement" set framework for gas-price deregulation & open pipeline access. Hydro Quebec opens high voltage DC interconnect with New England.		FERC Order 451 raises price ceilings on "old" gas to market levels, which is tantamount to administrative deregulation of all gas. California lets some large customers purchase gas and pipeline transport separately.
1987	Government starts to let market determine how much "surplus" gas can be exported. Ontario begins provincial "unbundling" of gas services. Ceilings raised on power exports.		Repeal of 1978 Power Plant and Industrial Fuel Use Act, which had limited use of gas in electric generation. FERC faces Canadian protests on gas-transport cost calculation.
1988	CUSFTA forbids most restrictions on energy trade with U.S. "Canadian Electricity Policy" specifies role of National Energy Board.		CUSFTA forbids most U.S. restrictions on energy trade with Canada. Competitive bidding for new power capacity recognized by FERC.

1989	NEB Act Amendment (to take effect in 1990) aims at ending duplication with provincial regulation of power exports, but adds environmental criteria for issuance of authorizations.		FERC Order 500, coupled with earlier issuances, makes clear federal intent that gas sales and pipeline services should be separated. Wellhead Decontrol Act of 1989 sets full gas deregulation by 1993.
1990	Privatization of Petro-Canada.		A series of FERC rulings sets up precedents for approval of market-based electricity rates. Clean Air Act Amendments stiffen pollution controls on electricity generation.
1991	NAFTA negotiations begin.	NAFTA negotiations begin. Mexico announces energy is “off the table”.	NAFTA negotiations begin.
1992	Following the end of the “gas bubble”, spot markets start to appear. Canada, the U.S., Alberta, British Columbia, and California agree on principles to resolve gas trade disputes between California & Canada.	Amendments to 1975 Public Electricity Service Act allow private owners for certain types of power generation (but not for sale, except to CFE). Private import & export permitted. Pemex begins internal restructuring by function.	Energy Policy Act adopted, providing “open access” to power transmission lines and deregulating gas imports and exports involving countries with which the U.S. has a Free Trade Agreement. FERC Order 636 “unbundles” gas industry., embraces secondary market for pipeline capacity.
1993	TransAlta (Canada’s largest investor-owned utility) files for “unbundled rates”. Emission rules for thermal generating plants updated.		Wellhead gas prices totally deregulated. FERC urges Regional Transmission Groups to negotiate internal disputes rather than litigate.
1994	NAFTA accepts CUSFTA energy provisions. NEB must approve electricity exports, but not imports.	CRE installed as advisory body to Energy Ministry on gas & electricity. NAFTA exempts Mexico from some energy sections.	NAFTA accepts CUSFTA energy provisions. DOE must authorize electricity exports, but not imports.

1995	Canadian Environmental Assessment Act assigns relevant responsibilities to NEB and provinces. TransCanada PipeLines wins NEB approval for incentive-based tolls.	<i>Comisión Reguladora de Energía</i> made autonomous, seeking transparent permit processes for both gas & electricity. Natural Gas Law oks private investment (with non-discriminatory access) for new pipelines, storage, and local gas distribution.	
1996	Alberta and British Columbia initiate wholesale competition in electricity – with moves toward “deregulation” influenced by Order 888 in the U.S.	Various guidelines set up for how gas prices and rates are to be determined. Standardized data required from Pemex as well as from private CRE permit holders.	FERC’s Order 888 opens transmission access to non-utilities & invites wholesale electricity competition by “unbundling” services. Order 889 mandates electronic sharing of data on availability of transmission capacity.
1997	Quebec & Manitoba allow wholesale competition in electricity. Hydro-Quebec gets FERC approval to sell electricity in U.S. at market-based rates.	U.S. begins export of gas via binationally owned pipeline to fuel power plant in Chihuahua.	U.S. power suppliers allowed to “wheel” electricity across Quebec grid to wholesale Canadian purchasers. System of Independent System Operators begins in U.S.
1998	PanCanadian Petroleum is first gas producer also to market electricity to U.S.	CFE steps up awards of tenders for new generation by independent producers.	Clinton administration asks Congress to let FERC enforce NERC decisions (power still not granted, as of mid-2004).
1999	Emphasis shifts to some extent from large-scale hydro to small & mid-sized installations.	President Zedillo urges sweeping electricity sector reforms (still not enacted). CFE separates generation and delivery functions.	FERC Order 2000 provides for regional planning in expanding power grid.
2000	Huge Alliance Pipeline begins delivering Western gas to Chicago area.	Vicente Fox becomes first non-PRI President in seven decades & pledges energy reforms.	Roughly half of all states have enacted power restructuring in some form.

Opening Avenues for Competition in Each Country

Although both Reinstein and Donaghy hoped in their CUSFTA negotiations to discourage market distortions that might arise through unnecessary regulation of energy matters by their respective governments, they soon discovered that it would be politically and practically impossible to bind future regulators in this respect -- much less roll back instantly some rulings then in place. Yet any domestic energy regulation -- even though it might be highly desirable for reasons of health, environmental protection, or as a safeguard against market abuses -- might also influence international trade relations.

A purely technical barrier that had irked the Canadians especially was the "as billed" ruling of the Federal Energy Regulatory Commission (FERC) about how natural gas prices were to be calculated. Because of differences in price-accounting practices in the two countries, the effect of the FERC decision was to raise the "commodity price" for Canadian gas flowing through U.S. pipelines (i.e., the amount charged for a given volume of gas, as distinguished from the "demand charge" that was made regardless of the amount transported and used). The Canadians wanted the ruling overturned, but this was something the U.S. negotiators were in no position to promise. A partial accommodation was to provide a "safety valve" that would entitle either party to demand bilateral consultations among specialists if one country decided that regulatory actions contemplated in the future "would directly result in discrimination against its energy goods or its persons inconsistent with the principles of this Agreement" (Article 905 -- with emphasis added). At the very least, the framers of Article 9 assumed that this would fix a public spotlight on either intentional or inadvertent "backsliding".

One reason to encourage energy interdependence is to permit competition and choice among a wider range of supply sources. This ought to spur efficiency and – ideally – marginal-cost pricing that will award shares of the market automatically in a way that benefits consumers as a whole. But this “invisible hand” never works perfectly in real-life situations; and rivals search constantly for ways to influence market operations to their own advantage. One mechanism for doing so in the energy field is to control critical segments of the path between basic production and final consumption – so that potential competitors can be blocked completely or at least required to operate under economic handicaps. This is the “down-side” of vertically integrated public utilities for either gas or electricity.

On the other hand, that traditional pattern also had some logic to it. Monopolistic service-areas for these forms of energy were established in the United States and many other countries in order to avoid a chaotic condition in which the pipes and wires required to deliver the commodities to end-users in a given area would be duplicated wastefully by competing suppliers. Vertical integration also offered potential efficiencies of scale that had to be recognized. To protect those being served from abuse, regulatory oversight bodies were set up to review and authorize the rates being charged. Generally, these rates were tied to the “cost of service”²⁶ – although such intricate systems have been difficult to analyze, and “rate cases” have resulted in a unique category of legal specialists to research and argue them. To add complication, regulators have introduced social equity

²⁶ This aspect of energy regulation clearly had nothing to do originally with either a special regard for natural resources or the concept that energy service is akin to a natural right of citizens. Through the middle of the 20th Century, the bulk of pipeline gas along the East Coast of the United States was not “natural gas” from wells at all, but a manufactured product that might be based on a variety of raw materials – from coal to tree resin.

and other public-interest issues by shading the rates in various categories to favor residential customers, the poor, or occasionally even job-creating industry.

Some economists have long decried this whole approach to the public attitude toward gas and electricity enterprises; but only within the past few decades has there been a successful effort for fundamental change – in the United States and many other countries, including Canada and Mexico. There is no room in this dissertation to digress into an argument of regulatory theory. The only germane fact here is the new tendency to consider separately the functions of: 1) production, 2) transport in bulk over considerable distance, and 3) ultimate marketing and delivery to end-users. This paradigm change followed different routes in the three countries.

In the United States, one might say it began to take effect officially on November 1, 1993 – coincidentally, perhaps, exactly two months before NAFTA went into force. FERC Order 636 decoupled the various stages of the domestic natural gas industry between wellhead and ultimate consumer – effectively “freeing up” three distinct segments of enterprise to act independently on four-fifths of the North American gas market. As noted above, the National Energy Policy Act of 1992 was simultaneously launching a similar process for U.S. electricity. During more than a decade since then, FERC has continued to issue Notices of Proposed Rulemaking (NOPRs), subsequent formal orders, and case rulings that moved the process farther along and made its ground rules more specific.

FERC consulted with counterparts on Canada’s National Energy Board before publishing Order 636 on gas; and it has continued to cooperate with them (pursuant to its Order 2000) in working out conditions for participation by all categories of electric

generators – public or private -- in Regional Transmission Organizations (RTOs) that exchange power within states and provinces or across borders to maintain supply reliability. For the most part, however, Canadian regulatory reform has taken place (and in some cases, backtracked temporarily) on a province-by-province basis. Alberta decided in 1995 to create a competitive market for electricity generation, instituting a power pool for spot trading. One by one, others followed; and gradually utilities all across Canada also made arrangements individually to sell power directly into the United States. This, of course, is necessary for a regime of stronger interdependence.

Mexico's 1995 law on natural gas mandated non-discriminatory access to the new private pipelines, storage facilities, and distribution systems that it was authorizing. Pemex and CFE both resolved during the 1990s to reorganize their own managements to make the three functions mentioned above separately accountable; and a CRE general directive on accounting for natural gas aimed directly at eliminating cross-subsidies within Pemex.²⁷ This set the stage for forms of domestic competition in both gas and electricity that are quite different from those in either of the other two NAFTA partners, but which are nevertheless real.

The overwhelming majority of new generating capacity in Mexico is being built under private auspices; and almost all of it is to be fueled by natural gas. Because domestic demand is increasing so rapidly, the prospect in not too many years is for the existing electricity production facilities to be matched (and perhaps eventually outstripped) by a multitude of private enterprises. The latter will surely be motivated in

²⁷ "Energy Picture", p. 49.

large measure by the desire to hold down both fuel and operating costs . . . but so will the government monopolies in both gas and electricity. Competitive sourcing is a key; but this also obliges agreement within some sort of international regime if it is to work smoothly across national borders.

Since the price surges of 2000-2001, Mexican government authorities have taken two steps in price-control for gas that were certainly counter to free-market principles, yet not totally disruptive to the long-term goal of a continental energy market because they were surrounded by unusual conditions. First, in 2001, Pemex offered gas contracts (for a limited time) at a preferential price to certain categories of industrial consumers (who were being hurt badly by runaway prices), but who would then have to agree to hedge those purchases with futures contracts – and not necessarily through Pemex. Some months later, after the price of gas in the United States had settled back to around \$4 per mmbtu, Pemex set the contract price it would charge such entities (on a “take-or-pay” basis) at \$4 for three years – again regardless of what supply and demand on the open market was showing as the “correct” spot price.²⁸

In the first instance, Mexican energy officials apparently wished their businessmen and industrialists to acquire some experience with techniques of risk management that were barely recognized in their country at that time. This effort does not seem to have been a great success, but that may still be too early to judge. The second experiment started out to be a debacle for buyers, as uncontrolled U.S. gas prices fell steeply – averaging well below the “special” Pemex price through the autumn of 2001 and most of 2002. But a Mexican official reminded me later that market prices (which

²⁸ Pemex continued, however, to tie its “reference price” to prices in Houston.

had risen again in the meantime) might not be far from the free market price over the full term of those earlier Pemex gas contracts.²⁹

This has prompted me to reexamine Pemex and *CFE/LyF* in a new light. They are virtual monopolies within Mexico. The existence of a single buyer in each instance dominates the wholesale market. Yet, by my new (and admittedly offbeat) interpretation, they might also be regarded as “middle men” – buyers and sellers, not unlike corporations of the scope of AEP in U.S. electricity or Exxon Mobil in oil and gas. “Virtual competition” exists for Pemex itself domestically at a hub such as Los Ramones, because gas can flow in or out of that site along three different routes. The price charged to Mexican consumers (or to certain ones) may be whatever the government decides; but the differential from a strictly market-determined price represents a conscious and purposeful internalization of perceived externalities – similar to the “insurance” offered in the futures market. The premium for this “mandated hedge” might in theory be paid either by the government or by the purchaser, depending on the circumstances.

In the case of natural gas, the government itself had been offering a “hedge” price. What appeared to be a pure subsidy might fairly be viewed as a form of government insurance against price volatility (for which, technically, a premium should have been calculated and factored in). It was not much different from a restricted, government-sponsored market for options or futures. For reasons of national interest, price volatility could be viewed as an externality the parastatal was willing to internalize. Pemex (which is a huge self-producer and merchant-purveyor of natural gas, but also a substantial purchaser) was prepared to take the risk upon itself and offer a supply contract at a fixed

²⁹ Ambassador Andrés Rozental, personal discussion in Washington, April 8, 2003.

price. Economists who wear silhouettes of Adam Smith on their ties are free to scoff; but this is the way things work in the real world of the North American gas and electricity regime.

Parts of Canada have reacted in a somewhat similar manner under comparable circumstances. Stung by public protests over increases in retail electricity rates, Ontario's government simply capped them for several categories of customers in late 2002 and early 2003. Suppliers of electricity have protested that this would plunge them into bankruptcy, following the precedent in California. The provincial government itself could wind up footing an enormous bill – again following the sorry example set by California. Nevertheless, questionable domestic policies of this type only distract (not detract) from the basic efficacy of international trade.

So long as they are neither universal nor permanent, such sporadic affronts to free market principles inside any of the three North American partners will probably be endured. Unfortunately, each country will probably continue to fiddle with gas and electricity prices, but the result for the overall regime is only an ongoing modification of rules – an annoyance, but not a fatal flaw. To repeat an earlier citation of Krasner, alterations of rules constitute a change within a regime but need not signal its demise!

“Deregulation” is a misnomer as applied generally to the gas and electricity industries. The term “regulatory reform” might be apt, although it is frustratingly vague. Some form of government regulation will probably always be with us, for the same reason that eliminating all traffic laws would produce bedlam and an unacceptable threat to public safety.

The respective environmental regulations related to energy in all three countries are likely to become more subtle and sophisticated; and the lack of uniformity in their rigor and degree of enforcement often inspires charges that one geographical area or another offers haven to polluters.³⁰ This is another problem that needs to be tolerated for the time being, because the cultures and capabilities of these three quite different nations make a single environmental code an unachievable goal for years to come. The best we can hope for is “harmonization” of the rules by some reasonable definition, accompanied by a workable system of dispute resolution and enforcement.

On the other hand, rigid domestic price controls, exorbitant subsidies, and/or guaranteed monopolies at the wholesale level that pay no heed to economic efficiency are hindrances to successful energy interdependence that can be as bothersome as tariffs. An aim of the regime can and should be to avoid them if possible, try to phase them out where they exist, and always attempt to minimize their interference with trade. In other words, the gas-and-electricity regime is dedicated to strengthening these specific functional relationships among the North American nations in both ways Doran considers prudent: “innovative deepening” and “remedial deepening”. As he explains it . . .

Innovative deepening “breaks new ground” within the trade area in terms of policy harmonization and the installation of new common standards. It establishes priorities for additional liberalization, a timetable for such advancement, and tactics for how to proceed . . . Remedial deepening is necessary to clear way the “underbrush” that grows up after the “tall timber” of tariff protectionism has been removed.³¹

³⁰ At least the North American Commission for Environmental Cooperation monitors the situation in this respect and serves as a watch dog – albeit one that must rely more heavily on bark than on bite.

³¹ Charles F. Doran, “When Building North America, Deepen Before Widening”, in *A New North America: Cooperation and Enhanced Interdependence* (edited by Charles F. Doran and Alvin Paul Dreschler), Praeger, Westport, Connecticut, 1996, p. 73.

The essence of what is needed for energy interdependence to thrive in a multi-nation market is: 1) for entry into the industry and access to energy products and delivery systems to be relatively open across most of the market; and 2) for pricing systems to permit sufficient competition so that market forces can be felt. This involves a “judgment call”; but Canada, Mexico, and the United States are high on the list among the more than 70 countries that have taken steps toward allowing energy markets to function more freely and toward “unbundling” the production, transport, and distribution functions. Both of these were necessary for a useful trilateral regime to emerge, because access to substantial portions of each national market was indispensable.

A troubling problem exists in the great power of state public utility commissions within the United States. Flyups in wholesale prices for electricity during periods of peak demand induced California (which, incidentally, maintains its own “command and control” energy system via prodigious restrictions on fuel uses) to retreat from “deregulation” as far as possible. But this dilemma will not be resolved in the near future, and the multiple “playing fields” within the intercontinental market need not all be level – or equal – so long as transparent rules in each instance are understood by all and are not subject to unanticipated, whimsical changes within the overall regime. With that much assured, a generally free market is able to accept such differences as internalized externalities³² . . . and to work around them.

³² Although President Richard Nixon’s record on energy is tainted by his desperate and foolhardy call for “energy self-sufficiency” shortly before his resignation over Watergate, he backed a number of cogent policy ideas during his first term; and internalizing externalities was one of them. Vito Stagliano’s book, *A Policy of Discontent: The Making of a National Energy Strategy*, quotes Nixon as saying in 1971 that “We must get back on the road of increased efficiency . . . [in part by] . . . pricing energy on the basis of its full cost to society.” (Pennwell Corporation, Tulsa, 2001, p. 21).

Applying Information Technology (IT) to Energy Markets

As the North American regime stands now, commerce in gas and electricity across international borders is – by definition – wholesale trade. One can foresee a time when suppliers in one country could serve retail customers in another directly as a common practice; but that complication is too far off to bother with at present. Under the absolutely rigid wholesale price regulation that prevailed through the 1970s and much of the 1980s, however, competitive impulses that might affect both supply and demand were restrained. The reactions to changing circumstances that characterize interdependence (for better and worse) were limited by an artificially static price situation that showed little economic benefit from trade back and forth. Once prices were allowed to fluctuate in response to changing conditions, the new market dynamics cried out for improved information sources and quick response time to take advantage of them. Coincidentally, modern communications technology was prepared to offer its tools to buyers and sellers in a way that canceled out distance.

One complication has arisen from the replacement of the old “regulatory compact” by which vertically integrated gas and electricity utilities were almost guaranteed a “target” rate of return on investment if they would guarantee service within assigned areas, accept imposed fee schedules for various categories of customer, and give regulators extraordinary access to accounting data. In a generally competitive market, energy marketers accept more risk in return for potentially greater returns; but some details of their individual transactions become confidential business data. This has been a sore point for data-collection and analysis organizations such as the EIA. More gravely, it

has invited falsification of information (even at the risk of prosecution) to permit price manipulation. FERC is still at work on posting and reporting systems that make price movements transparent and accurate overall while giving adequate protection to competitive enterprises.

Wholesale prices for natural gas and electricity change now in some parts of North America at intervals of an hour or less. The fungibility of gas, the establishment of gas marketing and storage hubs around the United States, and the “unbundling” of pipelines (which has turned their delivery capacity into a separate price-competitive commodity itself) have combined to make it possible and sometimes attractive to buy gas from a supplier thousands of miles away for “delivery” the next day. This continental gas market is a reflection (“writ large”) of electricity exchanges that have taken place for decades in the PJM Interconnection, through which electric utilities in the Middle Atlantic States have long cooperated to increase reliability of their service and reduce costs without the need for uneconomically large reserve margins in generating capacity.

Orders, offers, and delivery of either gas or electricity can be accomplished now almost instantly. Simultaneously, prices can be hedged in futures markets to limit risk. Such a capability was probably necessary to prod actors into the gradual, ongoing formulation and adoption of a set of rules to govern such transactions. Thus, information technology (IT) has been another necessary factor in the construction of the regime as we recognize it today.

High-speed, relatively cheap, and virtually omnipresent computers make such a system effective over an area of several million square miles in North America. Thousands of buyers and sellers are involved. Techniques are constantly being improved

and adapted; but all one needs in order to grasp the nuts and bolts of how the process works is this straightforward account of how an Independent Systems Operator (ISO) in New York State during the year 2000 handled most power trading for the next operating day:

The ISO's price for electricity floats according to supply and demand. . . . At 5 a.m. the utility's energy traders begin submitting bids to the ISO in Albany, N.Y. to buy electricity on an hour-by-hour basis for the next day. At the same time, power suppliers register the amount of electricity that will be available during those periods and set an asking price. A computer matches customer to suppliers . . .³³

That is typical. In a "pool" system such as the one of which New York is a part, bids to supply power are accepted in order – starting with the lowest price offering and moving upward until all demand appears to be satisfied. Upon dispatch, each supplier is rewarded at the price level of the final block of power required for that given time period (the marginal price). Of course there may also be bilateral contracts between a specific supplier and a single buyer, sometimes extending over long time-frames. One of the many flaws in the system California has now abandoned was that such long-term contracts were not permitted. All transactions were thus exposed to short-term volatility (as well as chicanery, as things turned out).

The details of this part of the regime are still evolving. Anyone wishing to trace the separate development paths of electronic marketing for gas and for electricity might begin with the two consecutive essays by Benjamin Schlesinger in the latest edition of

³³ Sullivan, Allanna, and Hegedus, Nathan, "Con Ed Customers Get Tough Lesson on Deregulation", *The Wall Street Journal*, August 23, 2000, p. B-6.

John Treat's useful guide to "Energy Futures".³⁴ Those chapters helped me to develop a framework for the following abbreviated treatment.

Long-distance natural gas trading in North America started out much earlier than interregional trading in electricity; and gas commerce is still more vigorous and farther advanced technically than power marketing. As the 21st Century opened, the industry had already built up nearly two decades of experience in short-term "shopping" for wholesale gas and for pipeline delivery capacity when Schlesinger hailed

an extraordinarily competitive, robust business, one that has become the commercial model for gas industries throughout the world. Gas supplies are traded in spot markets alongside long-term contracts, and capacity in pipelines and storage caverns is likewise traded on a commodity basis. Electronic markets (screen trading) and price risk management tools are widely used.³⁵

By contrast, the collegial arrangement to swap electricity within PJM was an anomaly rather than common practice until the early 1990s. "Serious" commodity trading in electricity started only after the National Energy Policy Act of 1992 ordered all investor-owned utilities in the United States to "wheel" electricity within or across their heretofore sacrosanct "service areas" if a consumer wished to purchase power directly from a third source.

Having had a head start, gas marketers moved in swiftly to handle most of the early electricity trading; but competition within this separate new field expanded and diversified at a head-spinning pace. Roughly half a dozen U.S. power marketers in 1995 increased in number by an order of magnitude within a single year. By 1997 more than

³⁴ Dr. Benjamin Schlesinger, "Natural Gas Trading and Futures Markets" and "Electricity Trading and Futures Markets", in *Energy Futures: Trading Opportunities*, 3rd edition (John Elting Treat, ed.), PennWell Corporation, Tulsa, 2000, pp. 37-74.

³⁵ Schlesinger, p. 37.

90 different companies were involved, and domination of the market by the largest players started to give way to broader competition.

Things did not always go smoothly. Regional surges in demand for electricity during the summer of 1998 produced brief but phenomenally violent price spikes; and this encouraged many (but not all) marketers and customers to develop plans and procedures to help manage risk that involved a mix of spot sales, “day ahead trading”, longer term contracts (which were permitted in most places), and hedging on the futures markets. Some of this was handled by phone calls and faxes, but electronic exchanges and electronic “bulletin boards” soon proved most convenient.

The New York Mercantile Exchange (NYMEX) – which must be regarded as a working part of the regime – developed rules for electricity futures trading that began in 1996; and soon it was possible to pinpoint sales and purchases to several pivotal locations around the continent. Because there is no single grid that interconnects all the “hubs” there are sometimes sharp differences in price levels among them; but wherever trading can take place – even across borders – the resulting interdependence of electricity’s “commodity price” through arbitrage is obvious.

It is far more difficult to calculate “fair” transportation costs for electricity than it is for natural gas. The flow of gaseous fuel is directed through pipes from one point to another along fixed routes that can be controlled. The physics of flowing electric current is not that predictable. One of the “technical considerations” mentioned in Chapter III was that electrons moving under the “pressure” of high voltage follow the paths of least resistance along interconnected power lines. To get from one location to another, electricity may flow far afield while moving in the general direction of its destination. It

may loop beyond the boundaries of “service areas” . . . and states or provinces. It might even cross and recross international boundaries along the way. If transmission lines had infinite carrying capacity, this would not matter; but they do not. “Space” on power lines may have a premium value if demand for it makes it scarce at a given time. Traffic along lines is challenging to police, and “congestion” becomes an issue when it occurs. The technicalities of how such problems can be solved are beyond the scope of this commentary, but they are irrelevant anyway – except to illustrate how important it is that rules be agreed upon. Hence, the need for a regime!

Transport services for gas and electricity are both subject to price competition under the new marketing arrangement that is distinct from competitive pricing for measured amounts of the energy commodities themselves. Instead of a flat “demand charge”, space on transmission lines and in gas pipelines is routinely bought and sold. The delivery charge (which is customarily subject to negotiation) is tied directly to the volume of the commodity to be delivered, but also depends on how crowded the pipeline traffic is at the time. Because such space is often booked in advance, it was natural for “secondary” markets to appear. Delivery capacity that an original contractor doesn’t absolutely need can be resold to third parties in a separate competitive market. In cases where congestion dictates that high demand must cope with limited availability, premium prices result – though usually for only limited time periods. Elaborate systems of auctions, rules and regulations evolved; but they varied from place to place because they were the result of initially uncoordinated legislation and regulatory decrees.

This summary barely hints at the complexities involved.³⁶ Efforts by the Federal Energy Regulatory Commission to impose some order have been hampered by jurisdictional “seams” in the market and by limits to the Commission’s own authority. Not only does FERC’s territorial mandate stop at the Canadian and Mexican borders; it has faced complaints and outright opposition from inside the U.S. market. This has been most notable since FERC tried to introduce a “Standard Market Design” (SMD). A common fear in States where electricity has been relatively inexpensive (e.g., because of abundant hydro potential, successfully run nuclear power plants, relatively cheap fossil fuel, etc.) is that if power trading becomes “too” easy far-away customers will bid the price up to satisfy their own demand. That battle is still going on; and the outcome will probably be founded on numerous compromises, including pledges to protect the “rights” of local utilities’ “native load”. One thing that is fairly certain is that whatever workable arrangement for the common good finally evolves will depend on widespread use of electronic tools that did not even exist a quarter century ago. They are critical to a regime that strives to function optimally.

Unfortunately, as observed above, there are opportunities for abuse as well as benefits in fast-paced electronic trading. Loopholes are still being closed since Enron and others demonstrated the ample temptations to exploit the system as it existed regionally during 2000-2001. Aggregated price reporting for both gas and electricity relied on an

³⁶ Furthermore, changes will surely continue. Although there is always a time lag, updates are made available at irregular intervals by such EIA publications as *Natural Gas Issues and Trends* and *The Changing Structure of the Electric Power Industry 2000*. For those who cannot follow the voluminous trade press and dedicated electronic news outlets, it is possible to find more nearly current information -- covering Canada and Mexico as well as the United States, and usually including critical assessments from an industry perspective -- in periodicals such as *Hart Energy Markets*, published monthly by Chemical Week Associates in Houston.

honor system for each merchant company that was vulnerable to deceit. The appearance of congestion (accompanied by unnecessarily inflated prices for delivery capacity) could be created by complicity between trading partners through “wash trades” that in reality should not have required any net transfers of power at all. As a result, the innocent have been tarred with the guilty; so numerous financially battered energy marketers and merchant power producers have simply left the business. Those remaining are hesitant to risk scarce capital in improving the physical infrastructure of gas and electricity connections. The way to restore consumer and political confidence is still elusive, but there can hardly be any doubt that more transparency in the free market (which is an avowed norm of the regime) will have to include forms of very rapid assembly and display of data. That makes continuously up-to-date information technology a necessary factor.

Gas or Electricity – Which Do You Need?

If gas and electricity were not fungible as energy sources, the regime would be less complex . . . but also a good deal narrower in its implications for cross-border linkages. That is why the industrial convergence of these two energy sources must be counted as another distinct, necessary force in shaping the regime’s structure. Its influence has diminished recently, but the potential advantage of swapping gas and electricity (depending on relative price and availability) remains an important characteristic of the long-term continental energy outlook.

The North American “Btu market”³⁷ for gas or electricity emerged in a major way only during the late 1980s and the 1990s. Its importance has been magnified by the other three factors listed previously in this chapter; but it was made feasible only by the popularization of advanced combustion turbines – which grew in turn out of the metallurgy of jet aircraft engines. Mass-produced units, which come in a great variety of sizes, can be acquired and installed rather quickly at relatively low capital cost. Unlike large coal-fired or nuclear powered generators, they can be turned on and off swiftly; yet they are also capable of operating for extended periods if necessary at high conversion efficiencies -- especially when the exhaust heat from the primary turbine is used to generate additional electricity through a more traditional steam cycle. Such “combined cycle” turbines are often able to use either a refined petroleum product or natural gas as their fuel; so fuel-substitution is likely to take place if one is scarce or if prices diverge from the norm. Ordinarily, however, natural gas is the preferred fuel for CCCTs, and they have made up the overwhelming majority of all new power plant capacity installed in the United States and Mexico since the early 1990s.

When electronic markets for gas, electricity, associated transport, and financial derivatives are all sufficiently liquid, the beauty of the gas-electricity combination is that use-patterns for these two energy sources are both cyclical but with cycles that are frequently out of phase with one another – particularly over a large region. To the extent that variations in their respective demand curves over time are temperature-related, for instance, corresponding changes in a North American weather map throughout the year

³⁷ Btu is the abbreviation for “British thermal units”, which are units of heat content applicable to any form of energy. The energy value of gas and electricity can be expressed in equivalent terms, and losses from conversion can also be measured as “transaction costs” – especially when considering overall efficiency.

point up the value of speedy access to supplies of either gas or electricity. A major use of gas is for heating, while peak loads for electricity generally are to provide cooling. If Washington is sweltering at the same time Toronto is enjoying mild weather, Canadian gas may wind up fueling turbines to generate electricity somewhere in between in order to keep air conditioners operating satisfactorily on Capitol Hill. Use of electricity for heating is concentrated in the U.S. Northwest; but peak loads there rely heavily on hydro-dams . . . so gas and electricity demand peaks still do not often coincide.

The next relevant technological step to follow combustion turbines may be the commercial fuel cell, especially as a device for “distributed generation” – a possibility that persuaded the normally cautious *Economist* to bubble: “It could be every bit as dramatic as the revolution that hit the world’s telecommunications industry in the 1980s.”³⁸ That may prove to be a prescient observation, but only if “revolution” is recognized as an inflection point rather than an overnight transformation. The system of electricity generation and transmission already in place within the economically developed economies is so gigantic that it would take many years for incremental “DG” additions (either mini-turbines – which are often gas-fired too -- or fuel cells) to be noticed in aggregated statistics. More worthy of note here is the fact (overlooked with depressing frequency by non-specialists who over-enthusiastically about the introduction of fuel cells) that those devices will still require continuous infusions of a primary chemical source – to produce the hydrogen that feeds the cells and generates electricity. For many years to come, the leading candidates to become this source will include ordinary natural

³⁸ “The electric revolution,” *The Economist*, August 5, 2000, p. 19.

gas, compressed natural gas (CNG), and methanol – a product of natural gas. Thus, the interplay between gas and electricity is likely to continue.

To the extent that demand curves can be smoothed out, one can expect more economical and efficient operations. Nevertheless, uncontrolled prices for either electricity or natural gas tend to surge briefly under certain conditions. In fact, the U.S. Department of Energy estimated in January 2003 that average gas prices at the wellhead had been five times more volatile than the Standard and Poor's 500-stock index over the past decade, and wholesale electricity prices in the Eastern and Western United States during the preceding five years have been 20 times more volatile than the S&P 500.³⁹ One day in 1998, hot weather and unanticipated plant outages in the Midwest caused electricity prices in that region to soar from an average of \$25 per megawatt hour to more than \$7,500 per MWh for a brief period.⁴⁰

This situation should be no surprise. It corresponds directly to patterns of sharp peaks in demand and the relative unresponsiveness of demand for energy by end-use consumers to price (which, we must remember, is generally masked at the retail level by institutionalized regulation). The explanation for legitimate jumps in supply costs lies in the stepwise way supply must be brought on line – especially in the case of electricity. Power has always been dispatched to networks in order from whatever generating sources are available, starting with the lowest-cost “baseload” units and moving up gradually to the most expensive “peaking” units – which are normally held in reserve and called upon only when absolutely required. This produces a supply cost curve that economists liken to

³⁹ EIA News Release, “Use of Financial Derivatives Grows Rapidly in U.S. Oil and Gas Markets but Electricity Market Lags”, January 16, 2003.

⁴⁰ EIA, *Derivatives and Risk Management in the Petroleum, Natural Gas, and Electricity Industries*, Washington, October 2002, p. 35.

a “hockey stick” – fairly flat along the horizontal axis until the supply system gets close to its capacity limits, at which point it swings upward to a near vertical line. As demand subsides, the cost (and wholesale price) should drop off just as sharply.

A fully interconnected, integrated, and competitive network for electricity alone can decrease the number of such fluctuations as its area expands. The more supply units are available to be called upon, the more likely it is that use of the most expensive sources can be postponed and ultimately minimized. By the same logic, it becomes possible to cut back safely and prudently on the total generating capacity that must be held in reserve throughout an interconnection. Experience has borne out this concept: Between 1978 and 1992 the capacity margins for all U.S. utilities averaged between 25 and 30 percent, but during the rest of the 1990s this was allowed to decline to around 15 percent without serious consequences.⁴¹ Of course there might still be problems if isolated areas fail to prepare adequately in accord with the regional plans and advisories developed by NERC; but this only underlines the value of that body as part of the continental regime and the desirability of providing it with some enforcement powers.

One reason the supply of electricity requires such close and constant coordination is that this energy commodity defies practical attempts to store it in large quantities. Pumped-storage behind dams is inherently wasteful, besides being capital intensive. In the case of most power plants, it also ties up too much unproductive capital to hold many of them in ready reserve. In a gas-electricity complex, however, gas can also become – to a certain degree – a more convenient medium of energy storage. This is what prompted many marketers during the 1990s to acquire sources of both gas and low-cost gas

⁴¹ EIA, “Electricity Supply and Demand Fact Sheet”, from its website, May 13, 2003.

generating units, along with the transport capacity of gas pipelines. The idea was to offer whatever was in greatest demand at a given location at a given moment – energy sales, cafeteria style.

The concept is still sound, although it has broken down (temporarily, at least) in practice. Short-term volatility in electricity prices could not be eliminated completely; and fast-growing marketers either could not or did not pay proper attention to the problems of credit risk and default risk. With so many small, heavily leveraged players in the field, there were times during the California crisis that contingent supply agreements were simply not honored. Hedging electricity obligations in the derivatives markets had failed to provide adequate protection because the market never achieved “critical mass”. Far from becoming the trillion dollar futures market that had been projected in 1998, exchange trading in electricity futures and options “virtually collapsed” during the final quarter of 2000. NYMEX delisted its contracts for lack of trading, and other exchanges suspended such trading soon afterwards.⁴² One after another, firms either went into bankruptcy or withdrew from any effort at energy marketing except to buy or sell for their own requirements.

The fact that bilateral contracts now seem to predominate does not eliminate the possibility of competition. Nor does it eliminate the basic complementarity of natural gas and electricity. Gas is still flowing south into northern Mexico for the new combustion turbine units there. New pipeline transport for gas from the far north is still being planned. Whether it originates first from the U.S. North Slope of Alaska or Canada’s Mackenzie Delta, it will traverse parts of both countries. And much of it will serve to

⁴² EIA, *Derivatives and Risk Management in the Petroleum, Natural Gas, and Electricity Industries*, p. 29.

generate electricity, because that is the fastest growing segment of gas demand in all three countries of North America. Whatever has to take place, the regime is capable of adjusting to circumstances and making things work.

Savoring the Fruits of Synergism

The whole is greater than the sum of its parts. Each of the key factors mentioned in this chapter thus far was necessary to realize full-blown energy interdependence and to trigger regime formation. All had to be present at once to spur development so rapidly; and this is what gave them jointly the character of sufficient causality. Once all were in place, the North American energy landscape was altered for good.

Numerous gas pipelines and power transmission lines now cross the U.S. border; and more are under construction or planned. Subcommittees of the North American Energy Working Group are exploring ways to make the process easier, while the North American Electric Reliability Council encourages cooperation in maintaining reserves and planning new generation or transmission facilities on a regional basis, regardless of national frontiers.

It is not easy to build such cross-border ties, but it would be far harder to abandon them. This is why I compare the process to “ratcheting” – a mechanical system that resists sliding back once it has advanced. “Ratcheting” in this case was a totally original idea as I first applied it to the energy interdependence of North America in talks and papers during the 1990s.⁴³ Stated most simply, it suggests that access to adequate and reliable energy is habit-forming for a population. Once a certain degree of interdependence has been achieved, the only practical way to ensure such access is by

⁴³ Dukert, “The Evolution of the North American Energy Market,” p. 40.

continuing to use the physical means of energy trade in place – the pipelines and powerlines that happen to extend across international borders. I am convinced that even such a vitriolic nationalist as Cuauhtémoc Cárdenas – who surely would have squelched further attempts to loosen *CFE*'s grip on the electricity network in Mexico if he had somehow been elected President of Mexico in 2000 – would not have dared shut down powerplants in the north of Mexico on which the residents of Chihuahua and Nuevo León had come to rely. Yet those generating units, in turn, have been designed from the start to rely on imports of U.S. gas. A dictator, of course, could take such action; a populist in a democracy simply could not.

The mutuality of benefits in the North American energy regime explains why Canada valued its opportunity to draw electricity from U.S. sources when a number of its nuclear reactors had to shut down simultaneously for an extended period during the 1990s. It explains why government and business officials on both side of the U.S.-Mexican border rushed into action to restore trust – in other words, to defend the energy regime -- when the frivolous lawsuit in 1999 by independent oil producers in this country prompted the delay in final removal of tariffs on natural gas. These are graphic illustrations of the principle Arthur Stein recounted as one explanation for the persistence of regimes:

There are sunk costs involved in international institutions and thus they are not lightly to be changed or destroyed. The costs of reconstruction are likely to be much higher once regimes are consciously destroyed. Their very existence changes actors' incentives and opportunities.⁴⁴

Krasner has pointed out that most students of regimes, whether they are “realists” or Grotians (an appellation he uses interchangeably with “liberals”) take care to

⁴⁴ Stein, *op. cit.*, pp. 138-9.

distinguish analytically between regime creation and regime maintenance. It appears that the first four factors mentioned above were necessary (and sufficient, when combined) to launch the North American energy regime. The fifth (ratcheting) is important to make sure the regime (and thus energy interdependence) does not suffer an adolescent death. The structure of this regime actually involves physical structures.

The specialized exemplar in this dissertation should support the portion of Krasner's perorating chapter in which he writes: "Regimes may become interactive, not simply intervening variables. . . . Once a regime is actually in place, it may develop a dynamic of its own that can alter not only related behavior and outcomes but also basic causal variables."⁴⁵

The North American energy regime has assumed a life of its own . . .

- NAEWG has moved from its original timidity about even using the word "harmonize" to working on a trilateral "Vision for the North American Gas Market".

Mexico has created an independent body with regulatory authority over Pemex and *CFE*; and the staff members of that body (*CRE*) now meet three times a year with counterparts from the FERC in this country and Canada's NEB in efforts to produce what they term "conscious parallelism".

In electricity, Regional Transmission Organizations are being

⁴⁵ Krasner, p. 358. Although Krasner acknowledges this point, it seems to me that he fails to make the full implications clear enough – something I shall attempt to do in Chapter VIII, "How Change Takes Place".

structured without regard to national borders under the aegis of a unique non-governmental organization – NERC.

By the end of this decade, the private sector will be operating new LNG facilities in all three countries – each feeding into an interconnected, continental pipeline network.

Environmental ministers for the three countries sometimes show greater sympathy for one another than they do for narrow “supply-side” interests in their own respective countries,

Trans-national groupings of governors and provincial premiers continue to pursue some energy-related initiatives that are closely bound to regional development, regardless of borders.

The regime exists! . . . as a semi-autonomous, albeit “virtual” entity. Yet it must also continue to interact with such basic contributory factors as the global distribution of energy resources, the hard-to-predict world energy market, and recurring international political/economic instabilities. For example, possible changes in the world energy picture (such as radical aberrations in the behavior of such players as the former Soviet Union, Venezuela, a reconstituted Iraq, or Saudi Arabia) might easily be reflected in this regional regime.

All together, the juxtaposition of these necessary and sufficient factors probably made it inevitable that something on the order of the North American Energy Working

Group would appear. NAEWG could be superseded by some other mechanism; but the energy structures of the three countries (and especially the interconnected gas and electricity) have become so interdependent that some means of consultation must persist. This does not guarantee that trilateral relations can always avoid stress. My conclusion is just that the negotiators of the CUSFTA energy chapter set in motion a force that a coincidence of circumstances has helped to blossom into what can justly be designated a trilateral regime. In terms of game theory, any of the partners who might be faced with a choice between cooperating or defecting from the regime's principles and norms will do its utmost to utilize the regime's continued existence in its own national interest. The particulars of such reasoning will be addressed in Chapter VII.

What would happen in the absence of even an imperfect regime? We might get some inkling by examining the abortive gas-trade negotiations between Pemex and U.S. companies during the late 1970s; and that is the purpose of the next chapter, "How an Earlier Effort Foundered".

VI. HOW AN EARLIER EFFORT FOUNDERED

The Story in Brief

Certain conditions during the late 1970s favored the initiation of a North American gas-and-electricity regime. Searching for “necessary and sufficient factors” (the subject of Chapter V) prompted me to ask why the prospects of mutual benefit for all three countries from energy interdependence had not “clicked” at that time. Might such a regime have been born almost 20 years sooner? Should it have been?

My investigation was serendipitous. It illuminated some aspects of U.S.-Mexican energy relations that have received conflicting interpretations ever since; and I knew that these disagreements had continued to strain some bilateral government contacts, clear into the NAFTA era. The detail in this unusually lengthy chapter is necessary to explain how and why the two countries failed in 1977-78 to reach accord on a massive purchase of Mexican natural gas by six U.S. pipeline companies. The result (combined with the final two chapters) clarifies the main theme of why a gas-electricity regime is now self-sustaining.

By 1977, the Arab Oil Embargo and abruptly higher oil prices had made all forms of energy a regular topic of front-page news and editorial-page comment. Some electricity exchanges were taking place across both our northern and southern borders. Canada was already a large supplier of natural gas to the United States; and Mexico had just discovered gigantic new oil reserves that would produce more “associated” gas than it knew what to do with – although even then it was considering the conversion of some domestic power-generating units to use that fuel instead of high-sulfur oil (which could

readily find profitable foreign markets). The 1961 oil policy of Prime Minister John Diefenbaker had envisioned continental supply patterns as a mechanism for free-market efficiencies; and a powerful figure in the U.S. Senate (Henry “Scoop” Jackson) had championed consideration of an integrated energy system for the whole Western Hemisphere.¹ One might have expected a more strenuous, conscious (and successful) effort on the U.S. part to foster North American energy interdependence in its own interest. It also seemed that Canada and Mexico stood to gain.

The negotiations that went on between Mexico and the United States concerning plans for an export pipeline from the south might have been the triggering event for a tri-partite continental approach. Yet the bilateral talks collapsed abruptly in an often-publicized confrontation. There were vindictive exchanges over what was portrayed generally as a relatively modest difference between a price for the gas that Pemex and private U.S. companies had agreed upon and another price that U.S. officials (and, personally, Energy Secretary James R. Schlesinger) were insisting on. In fact, both “sides” were interested in driving a hard bargain; but each represented multiple interests and complex dynamics. Both were oblivious to some of the relevant facts.

I now conclude that President José López Portillo had determined in advance of that meeting of his personal emissaries with Schlesinger on December 21, 1977, that it would be in Mexico’s national interest to scrap almost any gas-export deal for the foreseeable future and instead to focus on using the gas domestically. Despite skepticism from U.S. observers (then and now) about such a conclusion, I think that new documentary evidence suggests that this was probably López Portillo’s underlying

¹ See Committee on Energy and Natural Resources, *The Western Hemisphere Energy System*, U.S. Senate, Publication 96-45, U.S. Government Printing Office, Washington, 1975.

intention from the beginning – although it was not supported unequivocally, even within what most foreigners regarded as an absolutist administration. Furthermore, it is hard to argue that the course he chose did not turn out to be best for his country – despite the fact that it was probably grounded in his own naivete about energy and his basically anti-American feelings. In retrospect, I believe it may also have been best for the United States that the deal fell apart when it did . . . even though we wound up paying a higher unit price for a much smaller quantity of Mexican gas a couple years later.²

Washington had given fair warning (in advance and all along) that a contract such as the one Pemex drew up in mid-1977 would violate U.S. national policy interests in several ways (not just base price). Eventually, the U.S. authorities backed down to a considerable extent; but last-ditch efforts failed to modify the terms in a face-saving manner. Even after the “blowup”, Schlesinger and many others in this country (while displaying what I consider a lack of sensitivity to Mexico’s pride and heritage) genuinely thought the two sides had reached a compromise that would be fair and acceptable on economic grounds.

Exactly what happened? The most comprehensive and balanced accounts of which I am aware are: 1) a chapter entitled “Mexican Gas: The Northern Connection” in Richard R. Fagen, *Capitalism and the State in U.S.-Latin American Relations*, Stanford University Press (1979); 2) the chapter entitled “Mexico and the United States: The Natural Gas Controversy” in George Grayson’s *The Politics of Mexican Oil*, University of Pittsburgh Press (1980); and 3) a 169-page U.S. Senate Committee study entitled

² One knowledgeable and experienced energy official who reviewed this chapter in manuscript form contended that the price paid later was not comparable to the one that had been in dispute earlier because it was exclusively for “peaking gas”.

Mexico: The Promise and Problems of Petroleum, produced at Senator Jackson's request in March 1979 (shortly after a summit meeting between U.S. President Jimmy Carter and Lopez Portillo had produced a cautious commitment "to open negotiations on a government-to-government level to see if the basis for a natural gas sale can be worked out"³).

Although all three of these sources got most of their facts straight, they failed to provide certain valuable context that is now available for the first time. They were not privy to (or discreetly chose to ignore) some of the machinations that took place on both sides. In this respect, they were indeed no better off than some of the actors in the negotiation drama itself, who were painfully unaware of much that was going on.

Like this account, the three works cited here were based on personal interviews and analysis as well as study of published documents and secondary sources. The earlier authors, however, did not have access to hundreds of internal U.S. government documents from that period that I have acquired under the Freedom of Information Act. Nor did they have the opportunity to consult some of the principal actors and their associates in both countries long enough after the events so that the participants felt free to discuss their own observations and intentions more openly.

³ Elizabeth Moler and James Bruce, *Mexico: The Promise and Problems of Petroleum*, U.S. Government Printing Office, Washington, 1979, p. iii. (cited hereafter as "Moler-Bruce Study"). This was a judicious and valiant effort to present the relevant facts, with the strength and weakness of avoiding "interpretation". Its crisp historical introduction (pp. 1-14) is worthwhile reading even today by anyone involved in U.S.-Mexican energy relations. Unfortunately, the "official" chronology of events in its Appendix F – which was probably supplied to the study's authors by the U.S. Department of Energy at the last minute – is not fully reliable. It suffers from omissions, errors, and the general confusion of having been "drafted by a committee" – some of which I have tried to set right by this account.

Some of my interviews were conducted more than 10 years ago⁴; but others took place as recently as late 2003 and early 2004 – after I had had a chance to study the contemporaneous records just brought to light. In either case, recollections had surely faded somewhat; yet I found my various primary sources remarkably consistent. Taken together, evidence from the old documents and the two groups of interviews alter in a few key instances the picture that has been accepted as “history” – from one side of the border or the other. The fact that the newly released U.S. documents were prepared in confidence as the reportorial basis of international political strategy and have remained classified for so long adds to their credibility in depicting various perceptions at the time. Although lacking similar documentary evidence from “the Mexican side”, I have succeeded recently in talking with officials who were involved most directly in the negotiations – which gave me comparable insights. They confirmed my earlier suspicions that neither Mexican nor U.S. attitudes were uniform . . . and that words and actions on both sides were often misinterpreted. The release of unedited Mexican government records from those months of negotiation would provide further useful information, but the limited Freedom of Information system inaugurated in Mexico recently is not broad enough yet to offer that opportunity.

Many authors (although not the ones cited specifically above) have portrayed the gas negotiations of the 1970s as a David-and-Goliath encounter in which the overbearing

⁴ For instance, I talked with Díaz Serrano at his home in Mexico City on August 1, 1992, taping the entire conversation and eventually producing an exact transcript. I spoke with Andrés Rozental Gutmán (who was then an Under Secretary in the Foreign Ministry) at his office on July 30, 1992, transcribing notes immediately thereafter. Numerous other interviews with U.S. and Mexican principals were conducted around the same time, either in person or by phone. Only after studying the FOI-released documents, however (i.e., in 2003) did I realize it would be so important to press for more information especially from the two top figures in Mexico’s Secretariat of Patrimony who had also been directly involved (Secretary Oteyza and Under Secretary Warman).

attitude of the United States undermined a promising deal that had been moving along rather smoothly. That is not the picture I draw now. The main problem stemmed from a semi-concealed power struggle within Mexico and the failure of both countries' representatives to understand each other's complex motivations.

Briefly, the reasons behind the initial U.S. government refusal in 1977 to sanction a private contract to import Mexican gas with the price and term conditions laid down by Pemex were a combination of economic and political:

- 1) Agreeing to pay \$2.60 per mcf to Mexico from the start could have brought an immediate 20 percent rise in the price of Canadian gas, which was already being imported in volumes larger than Mexico offered to provide (or might be able to provide), even in future years.⁵ Based on the increased total cost of U.S. imports, the marginal unit cost of the Mexican gas initially would have been outrageously high. Furthermore, one clause in the Mexican contract seemed likely to escalate future gas prices at an unreasonable rate and in an illogical manner – tying them to a petroleum product price that was not exactly comparable, but one that OPEC could manipulate. Political and economic repercussions would have been unavoidable.

⁵ The Mexican press and some labor leaders (who tended to portray the United States throughout the negotiations as unfair, hypocritical, and possibly even threatening military intervention to enforce its will) pointed out that the \$2.60 price was less than what was being paid for some U.S. imports of liquefied natural gas and probably was less than gas from Alaska would cost. However, the LNG was being bought (by waiver) in very small quantities; and the Alaskan gas pipeline proved sufficiently uneconomic when examined more closely that it still has not been built.

- 2) In the United States at the time negotiations started, an unrealistically low federal ceiling price of only fifty cents per thousand cubic feet (mcf) prevailed on most of the gas shipped in interstate commerce – a rule touted as “consumer protection”. Presidential energy advisor (soon to become Energy Secretary) Schlesinger expected Congress to raise this ceiling on “new” gas; but it seemed unlikely that it would go above \$1.75.⁶ An agreement to purchase foreign gas at a price much higher than that would have upset relations between the new Carter administration and the national legislature at a time when a comprehensive package of energy bills with sweeping consequences was on the table. Because of “roll-in prices” the adverse effects on consumers from a starting price of \$2.60 would not have been so great if the importing companies had limited their distribution to Texas; but neither they nor the Mexicans were interested in such an arrangement. President López Portillo considered it politically important that the Mexican gas go well beyond Texas to reach a number of states with large Mexican minorities in their populations.
- 3) Meeting reports show that the U.S. negotiators were open from the outset in explaining the reasons for their price stance, but these were

⁶ There were undoubtedly some members of Congress who might have favored a higher ceiling. On the other hand, although free-market principles in regard to energy were hardly in vogue at that time, there were some U.S. administration staffers whose prime objection to the proposed gas deal was its “take or pay” provision. One told me recently that he felt at the time the Mexicans were simply trying to “lock in” the export arrangement. He says we should have accepted any price the importing companies were willing to pay, with the proviso that they would be able to negotiate price and volume periodically on the basis of market developments. However, my study of the cable traffic between Washington and the U.S. Embassy in Mexico persuades me that this was not consistent with general administration strategy at the time. Nor do I suspect that Mexico would have agreed to such terms.

either not understood or disregarded by their Mexican counterparts. A compromise evolved during the final weeks of 1977 that appears to have originated with the Mexicans and might easily have proved acceptable to both countries; but it was repudiated by López Portillo himself. By that time, a gas-export deal was no longer vital to Mexico, and would have produced a political storm in that country. Therefore, Pemex Director General Jorge Díaz Serrano ignored opportunities to carry the discussion to the Vice-Presidential or Presidential level in this country. Foreign Minister Santiago Roel Garcia, the ranking Mexican official at the critical December meeting with Schlesinger, played a surprisingly minor role.

Well after the fact (on January 9, 1979), Schlesinger tried to explain much of this publicly. In remarks before the National Association of Petroleum Investment Analysts and the Oil Analysts Group of New York at the Waldorf Astoria, he alluded to his own reasoning on such matters. Although Grayson made a second-hand reference to this important speech⁷, its text had not been preserved in the DOE historical files⁸; and Schlesinger himself could not find a copy when I asked him for it, more than a dozen years later. Through the good graces of a New York energy consultant who had recognized its potential significance, I located a copy. Thus, I was able to present one Xerox of it to Schlesinger for his own records and another to the departmental archives.

⁷ George W. Grayson, *The Politics of Mexican Oil*, University of Pittsburgh Press, 1980, Chapter 8, footnote 14. Grayson's reference there is to a mimeographed paper presented by Judith Gentleman at a meeting of the Latin American Studies Association in Pittsburgh, April 5-7, 1979.

⁸ In fact, the historical binders at DOE contain no texts for any Secretarial speeches given between mid-December 1978 and March 1979. This might be explained by the frenzied startup of a new cabinet department, still struggling at the time with frequent "fire drills".

Schlesinger's abrupt manner and his understandable preoccupation with other energy matters turned out to be negative factors in the events of 1977; but it is simplistic to charge (as has been done frequently in both countries) that the deal failed largely because of his rudeness to the Mexican envoys at that one particular meeting – just before the scheduled expiration of the Memorandum of Understanding Pemex had signed with the private U.S. pipeline companies. This appears to have been only a dramatic (and convenient) excuse on the part of López Portillo. It is unfair to caricature Schlesinger as an unyielding bully who intervened belatedly, unilaterally, and unexpectedly in what should have been purely corporate negotiations. Except for what seems to have been the result of López Portillo's own personal petulance, the Mexican President was not “left hanging by a paintbrush” -- despite the successful emotional force of that image in a contemporary political cartoon.

At the same time, Díaz Serrano must have felt frustrated and bitter at the failure of the “end run” he had been employing to make Pemex instantly even more powerful . . . and an object of such popular awe that his own succession to the national presidency would be virtually a sure thing. Because his nomination by the ruling PRI party depended on his designation by the incumbent, however, Díaz Serrano had no choice at this point but to go along with López Portillo – who was also a close friend and protector. The President, always leery of kowtowing to the United States, insisted on reverting to his administration's original plan – namely, to use the gas pipeline exclusively (at least at first) as a tool of direct domestic development.

The preponderance of Mexican decision-making authority (including, most importantly of course, the President) had come to recognize during the negotiations that it

was possible -- and would be in the national interest at the time -- to “go it alone” in building the trunkline of a National Gas Delivery Network from southern oilfields to a point where the fuel it carried could be used primarily to further industrialize the Monterrey area. They could not have foreseen the “second oil crisis” that was to strike less than two years later, but – because the legislative fog in Washington had cleared by then – U.S. negotiators by that time were able and willing to approve an even higher price for Mexican gas (\$3.625). In view of the “gas bubble” that was to develop in the United States subsequently, it is just as well that the agreement in 1979 specified a much more modest amount of Mexican gas than offered earlier by Díaz Serrano; and U.S. imports trickled to a complete stop in five years (after a new argument about price). Meanwhile, Monterrey's industries thrived on gas from the south. Thus, no serious damage to either country resulted from the failure of the original gas-sale deal.

Some may disagree with my evaluation of only minor adverse consequences from the disrupted negotiations. In a phone interview on April 23, 2004, former Ambassador Stephen W. Bosworth – a principal in the negotiations – told me he regrets their failure and still believes that both countries would have been helped by an agreement for U.S. purchases of Mexican gas at that time.⁹ Nevertheless, Bosworth (now Dean of The Fletcher School at Tufts University) calls this chapter “very well done” . . . and says specifically that it characterizes the December 21, 1977 meeting accurately. He also supports my contention that negotiations were being directed on the Mexican side “from the top” (i.e., personally by President Lopez Portillo). He suggests, however, that Lopez

⁹ Kay McKeough is another person with firsthand involvement from the U.S. side (at DOE) whom I re-interviewed after studying the State Department files. She pointed out that exporting gas in substantial quantities might have encouraged Mexico to pay more attention sooner to the production of non-associated gas.

Portillo was influenced less by price details than by concerns about the domestic political reaction he anticipated at that point from any gas-export agreement.

In any negotiation, each side tends to recognize the complexities of its own drives and internal dichotomies . . . while ignoring, simplifying or distorting those of "the other side". Neither the Mexican nor the U.S. position had been homogeneous throughout the protracted discussions, as the next section of this chapter explains. Even more importantly (from the standpoint of this dissertation), various elements of the negotiation illustrate the fact that the time was simply not ripe for the sort of gas-and-electricity regime that would develop rapidly later -- a relatively short time later in the history of nations.

As the final section of this chapter will summarize, none of the fundamental factors outlined in Chapter V as necessary for energy interdependence in gas and electricity was in place during the 1970s. It was only in the years that followed that: 1) all three countries would come to appreciate the advantages of a freer energy market; 2) Mexico's belief in its own energy self-sufficiency would be shaken; 3) gas and electricity markets would converge; 4) arbitrage would become a day-to-day possibility; and 5) the ratcheting process could start to unite the continent irrevocably with large-scale pipeline and electric grid interconnections.

Thus, as it turns out, it is mainly negative clues about a tripartite gas-and-electricity regime that one can draw from the old bilateral gas negotiations. Nevertheless, the chance to fill some historical gaps and correct a few misperceptions makes it appropriate to tell the story yet once more – this time, in fresh detail, thanks to those “in

house” documents whose contents can thus become useful to scholars, politicians, and diplomats.

U.S.-Mexico 1977 Gas Negotiations, Seen in a Fresh Light

A widely felt scarcity of natural gas within the United States had made 1976-77 a winter of energy discontent, because gas provided a larger share of U.S. energy in the 1970s than it does today. This popular fuel comprised 63 percent of all primary energy consumed directly by the U.S. residential/commercial sector during 1975, almost 40 percent of industrial consumption that year, and 16 percent of the energy that went into generating electricity.¹⁰ In the expectation that it would protect consumers from possible price-gouging, the Federal Power Commission (FPC) had been trying through a complicated set of rulings to establish a national price ceiling on any natural gas that came under federal regulation by crossing State lines.¹¹ In most cases this meant that such gas had to be offered for sale at only about 50 cents per thousand cubic feet (mcf); but this return was not high enough to encourage much new exploration -- or even to persuade the major domestic suppliers to ship gas out of state so long as the fuel could be sold to end-users within Texas or Louisiana at unregulated prices. Although the resulting "shortages" were thus a result of poor policy rather than poverty of resources, they caused perceptible damage. Schools in some regions closed for lack of heat, and businesses suffered. Factories even reduced the number of work-shifts.

Squeezed by OPEC, the United States was also anxious to augment its supply of oil from "safer" sources; and it looked as if the impressive new discoveries of

¹⁰ Calculated from historical data in Tables 2.2, 2.3, 2.4 and 2.6 of EIA's *Monthly Energy Review*.

¹¹ For a fuller description of national rate proceedings between 1974 and 1978, see Robert L. Bradley, Jr., *Oil, Gas & Government*, vol. 1, pp. 417-420.

hydrocarbons in Mexico might help satisfy U.S. demand for two fuels at once. President-elect Jimmy Carter signaled a broader interest in improving this country's relations with its southern neighbor by asking his wife, Rosalyn, to represent him personally at President Lopez Portillo's inauguration in December 1976. On February 14-15, 1977 the two new chief executives themselves met in Washington. Energy was on their agenda, and it was one of various "bilateral issues" for which their communique pledged follow-up.

On April 22, 1977, in Washington, Pemex Director General Jorge Díaz Serrano met for the first time with Carter's energy advisor, Dr. James R. Schlesinger. The latter had supervised preparation of sweeping energy legislation that had just been submitted to Congress; and he was destined to become the first U.S. Secretary of Energy as soon as a full-fledged Energy Department could be established by statute. A confidential State Department cable to the U.S. Embassy in Mexico, dated May 5, 1977, described a "cordial discussion" in which the Pemex leader described plans for a "48-inch gas pipeline to carry up to 2 billion cf/d from Tabasco to McAllen, Texas" and asked for U.S. support in getting approval from the International Monetary Fund "for Pemex financing outside the IMF limit."¹² Díaz Serrano was cited as having told Schlesinger that the pipeline would be on line with half of its capacity within two years and would be fully available by 1982.¹³

¹² As things developed over the next few months, the prospects for a gas-export pipeline seemed to be so favorable for customary objectives of the International Monetary Fund (rapid and secure earnings of hard currency, sound fiscal behavior, and private-sector job growth without inflation) that this particular aspect of the project posed no real problem. Fagen and Nau quoted one source as saying the IMF just "waved its magic wand" – obviating the need to invoke its \$3 billion ceiling. (*op cit.*, p. 401)

¹³ Plans for this meeting had apparently been held close to the vest. This cable was signed nominally by Deputy Secretary Warren Christopher, but had been drafted by G.R. Rase and P.K. Bullen, of State's Economic Bureau. It was in response to an Embassy query of April 20 from "Thompson" (apparently the

Although Díaz Serrano may not have mentioned this in his first contact with the White House energy advisor, cable traffic between State and the U.S. Embassy in June revealed that Pemex was also in direct touch with the U.S. Export-Import Bank at around the same time. In fact, Exim Vice President for Latin America Richard D. Crafton and another Bank official (Rengers) visited Mexico City in April for discussions about financing for the pipeline.¹⁴

The State Department's May 5 summary cable quoted Schlesinger as having told Díaz Serrano on April 22 that "we would likely be willing to make a long-term commitment for gas imports from Mexico", and it said both sides decided that discussions should proceed on a fast track through contacts between "technical" energy experts – preferably under the "umbrella" of a "U.S.-Mexico Joint Consultative Mechanism" that the two presidents had agreed two months earlier would be established.

There were several reasons why the United States appeared anxious to buy both oil and gas from Mexico . . . and why the latter was anxious to sell (even though the cable says "Díaz Serrano noted the importance of maintaining a low profile because of sensitivity in Mexico on oil and gas development in general"):

1) Mexico had declined to join the Organization of Petroleum Exporting Countries (although it based its export pricing on the OPEC market, while subsidizing energy prices internally). Thus it could remain independent of any future cartel-like decisions about production controls -- or even embargoes -- that might jolt the United

chargé), which mentioned having "heard from sources in Mexico and Washington" that Díaz Serrano and Finance Minister Julio Rodolfo Moctezuma Cid would be meeting with Schlesinger the following day. (The meeting actually took place two days later.) Oddly, the meeting summary sent by State on May 5 did not mention the Finance Minister at all, although the retrospective chronology DOE assembled for Congress two years after the fact says that Finance Secretary Moctezuma Cid did accompany Díaz Serrano to Washington at that time for meetings with Schlesinger "and other USG officials".

¹⁴ State Cable 133687 (June 9, 1977), drafted by Crafton and forwarded through the Economics Branch.

States. For its part, Mexico would welcome firm export income; and both sides of the buyer-seller relationship seemed secure.

2) A commodity that was surplus within Mexico faced unsatisfied demand just across the border. The abundant gas associated with oil from the new Mexican fields would have to be “flared” (burned off, unproductively and unremuneratively) unless an export market for it could be found. According to the May 5 cable, Díaz Serrano told Schlesinger that Mexico lacked the capacity to re-inject the gas as a stimulant to enhance oil production (a common industrial practice) and that it did not have a domestic market for the gas.¹⁵

3) Selling the excess gas at almost any price would show a national profit, and delivering it by pipeline was clearly the most cost-effective method. Facilities to liquefy natural gas and ship it via refrigerated vessels were far more costly, although laying hundreds of miles of large-diameter pipeline also represented an up-front investment that would require international borrowing. The huge market in the United States was uniquely positioned to accept gas delivered overland, and the rich nation also looked like a ready source of either government or private financing to build the pipeline itself.

On the other hand some minefields lay in the path of energy negotiations between the two countries:

- 1) Historically, relations between them had been lopsided -- economically, politically and militarily; and there was a residue of long mutual mistrust.

¹⁵ Fagen and Nau discuss these reasons for Mexico’s initial rejection of alternative courses (*op. cit.*, pp. 394-5).

- 2) Dating back even before Mexican oil industry expropriations in the 1930's, hydrocarbon resources occupied a quasi-religious spot in the Mexican psyche. Rushing to sell off this fresh bounty of Nature to foreigners (instead of trying to use it for direct national development) struck some Mexicans as bartering one's birthright.
- 3) The United States was (and is) ambivalent about energy pricing. Its massive energy production sector (historically the supplier of "oil for the lamps of China", as well as an ever-expanding domestic market) naturally insisted on covering its marginal costs and turning a good profit under any circumstances. But American consumers had also grown accustomed to an unparalleled abundance of energy – at real prices that declined rather steadily until the trend was interrupted in the early 1970's by "greedy foreigners".

Criticism of the way gas negotiations took place (and fell apart) came eventually from both sides. Dr. Schlesinger (currently a senior advisor to the international investment firm of Lehman Brothers) and former Mexican Foreign Minister Santiago Roel García (who later became a Monterrey businessman) traded the epithet "liar" over accounts of their notorious December 21, 1977 meeting which broke off negotiations -- as well as the events that preceded and followed it. Nevertheless, the weight assigned to this specific meeting (by journalists, by officials on both sides of the border, and even by many diplomatic and energy historians) involves hyperbole about events and oversimplification of the issues.

It has been extremely difficult up until now to document details of that specific meeting. No contemporary memoranda of it could be found in the classified or

unclassified files of the Energy Department¹⁶, at the National Archives, in the accession descriptions of the Federal Records Center at Suitland, Maryland, or in any personal records. A computer search at the Carter Library similarly turned up nothing about the early gas negotiations. The hunt for other relevant government documents, employing the Freedom of Information Act, led to repeated frustrations over a five-year period; but persistent and increasingly specific requests and appeals eventually secured the release of more than 200 documents, including many confidential ones that have finally been declassified. These have been used to complement my earlier interviews and various secondary accounts, so that few gaps remain now in the record of the negotiations – which stretched out over much of 1977 and into the following year.

The most comprehensive chronology of events long appeared to be the aforementioned one, which was included as an appendix to the 1979 staff study ordered on behalf of the U.S. Senate Committee on Energy and Natural Resources.¹⁷ Apparently it was reproduced exactly as received from the Department of Energy -- typewritten, confusingly phrased, peppered with typographical errors¹⁸, and with the order of pages scrambled. It is dated January 30, 1979, so it was probably prepared in connection with the imminent visit of President Jimmy Carter to Mexico -- which took place early in February. Historic files for this period at the Headquarters of the U.S. Department of Energy are virtually non-existent, so no first-order copies of this document (much less any preliminary or edited drafts) could be located. To add to the muddle, a Mexican

¹⁶ Dr. Benjamin F. Cooling, who was Chief Historian of DOE at the time I started my search, was quite sympathetic to my efforts. He and his staff were frustrated by great gaps in early departmental records.

¹⁷ Moler-Bruce Study, Appendix F, pp. 157-162.

¹⁸ Remarkably, this “official chronology” sent to Congress even misstated the amount of gas offered for export in the original Memorandum of Understanding. The chronology used the figure “2 mmBTU/d” (i.e., two million British thermal units per day) instead of “two trillion”.

weekly journal, *Proceso*, reproduced most of this chronology in Spanish on March 19, 1979 . . . but changed its wording and occasionally its meaning.¹⁹ There seemed to be no deliberate pattern in *Proceso*'s revisions -- suggesting that the changes were caused more by misunderstanding or by sloppiness in translation than by malice or guile.

One person who had been a member of the Energy Secretary's policy staff told me in 1992 that this chronology was rewritten more than once before being submitted, and that at one point provoked mirth among those assigned to the task because "it made everybody look good." Regardless of shortcomings, it warrants a certain amount of general acceptance as an officially published source; so I have structured the following account around the chronology as best I could. However, I have interspersed data drawn from it with clarifications, amplifications and corrections, based on my personal interviews with participants and authentic contemporaneous documents uncovered through the FOI quest. In order to show how some developments took place in parallel, this necessitated occasional back-tracking and asides as my own narrative-chronology proceeds.

Despite the pledge for governmental action after the meeting of the two presidents, it was private U.S. energy sellers who had actually moved first on the gas deal in 1977. Jack Ray, chief executive officer of Tenneco, went to Mexico in early spring to investigate reports that at least some natural gas might be available from south of the border to supplement domestic sources for his company's extensive pipeline distribution

¹⁹ My Spanish-language source was actually a reprint included in *Petroleo y Soberania*, issued as a collection of articles in 1981 by the communication and information subsidiary of *Proceso*. In it, for example, a portion of the original chronology entry in English for December 15, 1977 ("Senator Stevenson public announced that he no longer objected (*sic*) to the proposed Eximbank credit . . .") was rendered as "*El senador Stevenson desaprueba el credito propuesto por el Eximbank . . .*" The emphasis I have added shows that *Proceso*'s translation is the exact opposite of what was obviously intended – despite DOE's typos.

system.²⁰ Appointments for him were set up through a Tenneco executive who had family connections with a high official in Pemex; but it came as a complete surprise to Ray when he was invited to Director General Díaz Serrano's home -- on a weekend -- for private discussions.

According to Ray, Díaz Serrano gave him details of the large amount of natural gas that was expected from Mexico's southern fields and offered to sell Tenneco 2 billion cubic feet per day (bcf/d). This would have been more than three-quarters as much as the entire United States was buying then from Canada, and would have provided this country with a comfortable cushion against its declining domestic production – which had fallen year-by-year in the 1970s despite increased drilling. However, the Pemex chief told Ray that Mexico could not afford from its own resources to build the huge pipeline that would be required to deliver the gas from its southern fields. He asked the American businessman's help in setting up the necessary financing, and Ray promised eagerly to intercede with the Bank of America and other institutions. What Ray may not have admitted to himself, however, was that there were political and economic reasons why Pemex may have preferred from the outset to deal with a consortium of U.S. pipeline companies rather than with Tenneco alone. Negotiating with a number of smaller participants might be easier than bargaining with a single large player. Making a number of U.S. States (especially those with substantial Hispanic populations) cognizant of Mexico's natural gas supply role would boost the prestige of Pemex and López Portillo.

²⁰ This information and some other references to Tenneco's involvement were obtained directly from Jack Ray in phone interviews on July 14 and 15, 1992. The May 5, 1977 State Department cable referenced earlier quoted Díaz Serrano as saying that by the time he first met Schlesinger Pemex had already been in touch with Tenneco – as well as another U.S. gas pipeline company, Texas Eastern, whose existing lines (according to Mexico Cable 09707) already reached the border at Reynosa. Díaz Serrano also told Schlesinger on April 22 that those companies were “willing to participate in financing Mexico's gas export program on a right-of-refusal basis, and to lease Pemex some necessary equipment.”

The timetables and volume for gas exports being bandied about by the Mexicans at this time invited skepticism. The U.S. Embassy reported in June that Díaz Serrano had said Pemex would spend a billion dollars on the line before the end of 1977²¹; and William Owens, a Vice President of Southern California Gas Company (SoCal), told State Department officials that Pemex had talked of gas deliveries to the border beginning that year²²; but both boasts seemed totally unrealistic. Engineering was still incomplete, a major part of the route remained to be surveyed, and acquisition of 48-inch pipe (the size used in the Alaska Oil Pipeline) was bound to be something of a problem. Background information cabled by State Department Headquarters to the Embassy in Mexico City on June 15 in anticipation of a meeting with Foreign Minister Roel estimated that total Mexican production of natural gas could rise to at least 1.3 tcf (3.6 billion cubic feet per day) by 1982, but that it might also take that long to bring exports up to even 1 bcf/d – although it was also possible that by then they would reach 2 bcf/d – which was the ultimate level Pemex was generally offering.²³ Some industry sources were even more dubious. Owens and SoCal General Counsel James Rooney (who thought their company might get 200 million cubic feet per day for itself while sharing the rest of the imports with other U.S. firms) expressed the opinion in late June that deliveries at a level of 1 bcf/d might not begin before the mid-1980s.²⁴ A few months

²¹ Mexico Cable 08837 (June 3, 1977) to Crafton at Ex-Im Bank.

²² Confidential Department of State Memorandum of Conversation (July 7, 1977), reporting on a meeting June 27 in the office of ARA Deputy Assistant Secretary for Economic Affairs Richard Arellano.

²³ State Cable 138449 (June 15, 1977), drafted by the Bureau for Inter-American Affairs.

²⁴ State Department MemCon of June 27 meeting with Arellano. The SoCal officials also “were quick to point out the obvious antitrust and regulatory problems” and volunteered the information that “the GOM [Government of Mexico] sees a direct linkage with prices for Canadian gas deliveries to the US.”

later, having scrutinized Pemex data and a contractual analysis thereof²⁵ – as well as engaging in numerous direct discussions, the U.S. Federal Energy Administration concluded preliminarily that exports of 2 bcf/d by 1982 were feasible . . . but only if Pemex’s capabilities were augmented by foreign technical assistance – which Díaz Serrano had previously rejected as unnecessary.²⁶

Mexico was outwardly more optimistic about its own prospects. When Pemex engineers briefed officials of the Embassy and the Exim Bank during the week of July 18, they said that the large-scale use of natural gas would be introduced into their domestic economy rapidly and that this initial consumption would then almost double within four years – from 1.7 to 4.8 bcf/d by 1982. Nevertheless, they said roughly 2 billion cubic feet per day would be available for export, beginning in 1980.²⁷ What makes their projections questionable in retrospect is that this calculated output of “associated” gas assumed a level of crude oil production by 1981 that would not actually be achieved until 20 years later . . . and that oil production in 1982 would have to be 3.65 million barrels a day, a number Mexico still has not reached.²⁸

²⁵ The DeGolyer and MacNaughton Report, ordered from a highly reputable U.S. consulting firm by Pemex.

²⁶ This is taken from one of several appendices to a confidential internal State Department strategy memo dated September 13, 1977, from Gerald A. Rosen (Economics Bureau) to Bosworth. This particular appendix is referred to as an updated draft, and appears to have been produced very shortly before the memo was sent. No “final” version surfaced during the FOI search.

²⁷ Some “gamesmanship” was involved here. The 1980 deliveries under a new contract would probably have been limited to only 50 million cubic feet per day – the same amount that U.S. firms had been authorized to purchase on an emergency basis during the winter of 1976-77 (at an extraordinary price of \$2.25 per mcf) and which was being offered for the winter of 1977-78. According to the September 13 State Department document on gas negotiation strategy, this was not associated gas from the south but non-associated gas that was being produced in modest amounts from Mexican fields in the Reynosa-Nuevo Laredo area.

²⁸ Nevertheless, the U.S. Central Intelligence Agency’s estimate in April 1977 had generally accepted the Mexican projections (CIA, *The International Energy Situation: Outlook to 1985* – cited by Fagen and Nau, p. 421, footnote 77).

The same Pemex briefing in mid-July, attended by an Exim Loan Officer as well as engineers from the Bank's staff, also disclosed that sales had already been discussed with no fewer than six U.S. pipeline companies – although no contracts had been signed. And Pemex was assuming a price of \$2.65 per mcf for revenue projections in such appeals for financing.²⁹

A month after the initial meeting in April between Díaz Serrano and Schlesinger, the DOE chronology says the broad bilateral Consultative Mechanism called for by the two presidents was established, with a sub-group to discuss “Energy, Minerals, Investment and Industry”. The chronology says this took place on May 25, 1977; but State Department cables referred repeatedly to the date of the meeting as May 26, and this must be correct. The U.S. State Department (which was handling arrangements on the Mechanism with the Mexican Foreign Ministry through our chargé at the Embassy in Mexico City) had suggested that energy be the subject matter for one of five sub-groups and that the U.S. side of this body be headed by the Office of the President's Assistant for Energy, with representation also from State, Treasury, and Commerce. Foreign Minister Roel initially suggested no fewer than 26 agenda topics for the full body (with energy buried halfway down the list); but apparently he acquiesced readily with the use of only five headings, while insisting that the delegations to the meeting in Washington include representatives of equivalent rank from each country. Besides Roel, Mexico's contingent was to include the Secretary of Budget and Planning, either the Secretary or Under

²⁹ Mexico Cable 12600 (July 29, 1977), which was passed along from the State Department to Cecil Thompson at FEA as well as to Crafton and the engineers from Exim.

Secretary of Commerce, the Under Secretaries of several other departments, and the Patrimony Under Secretary in charge of “Industrial Development”, Natán Warman.³⁰

Díaz Serrano did not attend this meeting, but Schlesinger kept him in the loop. He sent the Pemex Director General a letter on June 2 mentioning “a productive meeting with Under Secretary Warman following the cabinet-level meeting on May 26.”³¹ However, there is more to the story.

In view of the fact that Schlesinger had previously served in numerous high government positions (including Secretary of Defense, head of the Central Intelligence Agency, and Chairman of the Atomic Energy Commission) I was amazed to learn that Warman had not even been familiar with his name until a Deputy Assistant Administrator of the Federal Energy Agency for International Affairs named Cecil Thompson gave him a message during the general meeting on May 26, asking that he get together privately with President Carter’s energy advisor at the White House later that day. Moreover, what Schlesinger did not know was that Warman was bluffing throughout their meeting, because up to that time the Under Secretary had been told nothing of Díaz Serrano’s plans for gas exports.³² Although the head of Pemex was nominally responsible to the Secretary of *Patrimonio*, Díaz Serrano had not made the ministry aware of his extensive

³⁰ Although the name of Warman’s cabinet department in Spanish was *Patrimonio* and I have rendered it as “Patrimony”, Roderic Ai Camp in his *Mexican Political Biographies, 1935-1993* (University of Texas Press, Austin, 1995) translates it as “Secretariat of Government Properties”. It has gone through other name changes since then, but is the ancestor of today’s Energy Secretariat (SENER).

³¹ Sent as part of State Cable 127892 (close to midnight, June 2, 1977) and delivered personally the following evening.

³² It was the frequent mention of Warman’s name in the State Department cables I uncovered that prompted me to interview him at his apartment in Mexico City on October 17, 2003. Four days later I discussed these same events with former *Patrimonio* Secretary Oteyza at his office in the same city. Those two interviews provided a starkly different point of view, which helped me to fill in gaps and understand much of the FOI documentary evidence that had puzzled me at first. They are the source for many references and conclusions in the rest of this chapter – some of which U.S. participants in the negotiations may welcome as the first explanation for certain events that they also appear to have found baffling (and perhaps annoying) at the time. .

independent activities in this regard. Warman added to me at this point that there were frequent disagreements between Díaz Serrano and various ministries – including Budget and Finance.

Warman knew only of plans for a gas pipeline from Mexico's southern fields to Monterrey – as a new tool for domestic industrial development. Another Under Secretary (Ricardo García Sáinz) was nominally in charge of “all” of Mexico's parastatal companies; but Warman doubts that he knew much more about the full pipeline proposal at the time . . . because both Pemex and CFE were considered “too big to deal with” for officials at their level.

During that first Schlesinger meeting, Warman did his best to confine his remarks to generalities that wouldn't reveal his own lack of knowledge about the matter; but we may never be able to determine the extent to which his vague remarks were open to misinterpretation by Schlesinger. Interestingly, Warman volunteered to me his “clear recollection” (even more than a quarter-century later) of Schlesinger's putting his feet up on a small table at that session as he peppered his guest with questions about the pipeline, such as “What about the gas pipeline? How fast can you build it? Who will finance it?” In respect to the IMF limitation on the size of credit arrangements, Warman also says Schlesinger asked him “How did you ever sign that IMF agreement?”

Warman, who was ultimately removed from the negotiations on direct order from López Portillo, admits now that he knew little about either oil or gas and “didn't understand” his own President's concerns about national sovereignty in connection with the gas negotiations as they were developing. He said his own focus was strictly on bolstering Mexico's industrial development; and to him industry in general would be the

main business of the Consultative Mechanism's Subgroup on Energy and Industrial Development (to which he would shortly be named Mexico's chairman). This explains why he concentrated personally on having Mexican steel used in construction of any pipeline, although he realized that his country was not capable of producing all that would be needed on the rapid schedule that most players favored.

U.S. negotiators were largely – if not entirely – ignorant of how faulty the lines of communication were among Mexico's various emissaries. As a result, the two sides talked past one another much of the time. When asked in advance by the State Department³³ to offer its assessment of what the "most pressing U.S. objectives" should be in each of the working group areas, as well as what the Government of Mexico (GOM) was likely to "press most actively" on May 26, the Embassy had mentioned natural gas as the lead issue in respect to energy. Thompson's responding cable of May 20 suggested that "GOM will expect to receive U.S. proposals in this area rather than to make its own"³⁴, but that "any proposals GOM does make will probably involve sales of Mexican natural gas and may include seeking U.S. financing for pipeline construction." He added that "Some Eximbank help may be sought for Pemex equipment purchases in U.S." His final advice was that "They want to develop exports as fast as they can and we are their only possible customer for gas and their logical customer for most of their oil. They know, too, that we need the energy."³⁵ In conjunction with Díaz Serrano's earlier comments to Schlesinger, this laid the groundwork for the U.S. assumption that Mexico had no place else to go with its gas. Yet some Mexicans found this insulting – especially

³³ State Cable 107756 (May 12, 1977).

³⁴ This advice from the U.S. Embassy explains how Schlesinger could have mistaken Warman's coyness about specifics as a negotiating tactic.

³⁵ Mexico Cable 08018 (May 20, 1977).

since some of their high-level officials (even in *Patrimonio*) believed that Monterrey was the primary destination if a pipeline should be built.

At that time Pemex was sending about three-quarters of its still-limited oil exports to the United States³⁶, but it had refused to commit itself to deliveries to any specific country. Late on the night before the May 26 meeting in Washington, however, the Embassy reported to State a session two days earlier in which Díaz Serrano had told a visiting U.S. oil executive, Joseph M. Rault, that he had been forced to reverse this policy because of the need to raise half of his \$15 billion capital investment budget abroad during the López Portillo *sexenio*. The May 25 cable said that “Pemex is now willing to definitely commit specific quantities of oil and gas for delivery to the U.S. market in order to obtain the financing it needs to expand production.”³⁷ Later in this chapter, we shall see that such openness in respect to oil as well as gas was not unprecedented; but at this stage Díaz Serrano was clearly not speaking for all of *Patrimonio* – much less the entire Mexican governmental power structure.

As Director General of Pemex, Díaz Serrano was one of the most potent government figures in Mexico. The timing of his private assurance (and its premises) is significant, because Patrimony Secretary Oteyza was about to vent his anger to reporters

³⁶ According to the “guidance” provided to our Embassy by State Department Headquarters in Cable 138449 (June 15, 1977), Mexico’s total oil production amounted to only about 1 million barrels per day at that time. According to the historical statistics in EIA’s *Monthly Energy Review*, Mexico’s sales of crude oil to the United States doubled between 1976 and 1977, but they were still less than U.S. imports at the time from Canada – although the latter had fallen steadily since 1973. Starting in 1978 and through the 1980s, however, Mexico supplied us with more crude than Canada did – suggesting that hard feelings over the aborted gas deal did not discourage Pemex from nurturing a good and convenient oil customer. The June 15 “talking points” sent to the Embassy in Mexico City said that Mexican oil output was “scheduled to grow to 2.2 million B/D by 1982” but suggested that “With additional investment Mexico could produce even more”.

³⁷ Mexico Cable 08317 (May 25, 1977). See a later section of this chapter for the economic significance of such a statement.

who questioned him about remarks by U.S. Ambassador-designate Patrick J. Lucey back in the United States concerning this very topic. According to a cable from the Embassy very early on the morning the Consultative Mechanism was to be established formally in Washington, Mexico City newspapers were prepared to give prominent coverage that same day to Oteyza's insistence that Mexico was "not disposed to commit itself to provide petroleum to the U.S. in exchange for international financing obtained as a result of favorable U.S. influence."

The outburst came in reaction to accounts in the Mexican press on May 23 and 24, citing a story by R.T. Garrett of the *Dallas Times Herald*. In it, Governor Lucey had been quoted as saying that the U.S. government would intercede with international banks to help Mexico obtain credits to develop petroleum resources and become a new source of oil for the United States. According to the Embassy's cable requesting "any further information available to the Department concerning Ambassador-designate Lucey's alleged remarks", the Texas newspaper had quoted Lucey as stating that "There are some in Mexico who favor conserving the oil for the Mexicans, but this point of view is losing ground" and adding: "It seems the tendency of President López Portillo's government will be to push for rapid oil exports."

Oteyza disagreed quickly and vigorously. The Embassy cable followed some paraphrasing of his press conference remarks with what seems to be a direct quote: "We are disposed to contract credits under normal conditions to stimulate development of the country because our country has (a) good international reputation with respect to loans."

The Embassy cable went on bravely to “note that Gov. Lucey’s comments possibly closer to the mark than de Oteyza’s” . . . citing Díaz Serrano’s contrary expression.³⁸

Oteyza had been appointed Secretary of Government Properties (the official name of the ministry at the time) a year earlier, at the age of 34; and he was Díaz Serrano’s junior by more than 21 years. As Secretary he was *ex officio* Chairman of the Board of Pemex, but he told me during our October 2003 meeting that the Director General was “very close to López Portillo” in 1977 and that “in practical terms I had to fight” to exercise the ministerial office in respect to the parastatal company.³⁹

Patrimonio was nevertheless (in Oteyza’s words) “a very powerful ministry” – entrusted and concerned with both industrial development and the country’s natural resources. Yet Díaz Serrano (again in Oteyza’s exact words) “wanted to import everything, compensating for it with exports – using those resources.” Then Oteyza added: “He had decided to build a pipeline to the border.”

At any rate, the bilateral Consultative Mechanism came into existence that day in Washington as planned. The 1979 DOE chronology reports that Warman wrote Schlesinger less than a week later (June 1) to ask that U.S. officials come to Mexico for talks about “the utilization of gas from southern Mexico, including the construction of a Chiapas-Reynosa gas pipeline”. Yet no such letter with that date has been located in U.S. archives, and evidence from the FOI documents suggests that the chronology might be partly incorrect on this specific detail. Schlesinger’s June 2 letter to the Pemex chief

³⁸ Mexico Cable 08332 (sent just after midnight, May 26, 1977).

³⁹ One of the U.S. participants I interviewed (Kay McKeough) said she had been aware of this tension and likened it to that in other Latin American countries (e.g., Venezuela) where hydrocarbon riches have given the head of the national oil company more prestige and potential power than his nominal boss, the energy minister.

mentions the May 26 meeting in passing, but neither he nor the cover note from the State Department cites any invitation from Warman. Apparently one was sent at some point around then, however, because the chronology goes on to say that a bilateral meeting took place in Mexico City on June 29 “in response to Warman’s letter”. That meeting is recorded in the cable traffic.

There is now ample documentary evidence that red flags were raised for Mexico well in advance of the agreement Pemex signed with U.S. pipeline companies for sales from a gas pipeline to the border. With all the discussions that went on, it should have been clear that a “private” contract for gas imports would need U.S. government sanction to be implemented, and that there were certain provisions that U.S. authorities would almost certainly feel compelled to reject. The “official” DOE chronology fails even to hint, however, that conditions were also ripe for “missed” signals. The bilateral governmental discussions on gas were starting off (probably without U.S. representatives’ realizing it) along two separate tracks for Mexico. One was under the broad, multi-departmental auspices of the Consultative Mechanism, while the other was between Díaz Serrano and Schlesinger in what appeared to be an “inside energy” channel that both sides found comfortable (at least at first).

There is no question about the exact words Schlesinger used in his June 2 message, since it was transmitted via diplomatic cable.⁴⁰ It called for an early meeting of technical experts (preferably within two weeks, either in Mexico City or Washington) to exchange information about the “new field” of possible “long-term Mexican sales of natural gas to U.S. buyers”. But he warned Díaz Serrano that “There are many elements

⁴⁰ State Cable 127892 (June 2, 1977).

to be explored”, specifically citing “the regulatory processes involved in the introduction of gas into our interstate system, U.S. gas pricing and market allocation policies, and other aspects of the interface between the Federal government and the gas pipeline companies in the United States.” He went on to say that “Price policies would of course be of interest, as would an indication of the priorities which might be given to domestic and export commitments in the event gas demands should be greater, or production less, than anticipated.”⁴¹ Schlesinger’s letter also mentions the need to work out details about routes, operating characteristics, related storage facilities, and so on . . . and concludes with the observation that “These preliminary contacts would be coordinated with the activities of the Economic Working Group established May 26 under the US/Mexican Consultative Mechanism.”

The unexpected Pemex response (relayed in a cable from the Embassy on June 10) was to request yet another Washington meeting with Schlesinger, but one in which Díaz Serrano would be accompanied by Oteyza. Díaz Serrano’s office suggested the date of June 27, but offered to accept an alternate time if that date was inconvenient.⁴² U.S. Embassy officials expressed puzzlement when they learned that Schlesinger had agreed to the proposal, because the participants in such a meeting hardly fit the concept of “technical experts” and some important technical studies were not yet complete. Díaz Serrano would tell them only that he wished to discuss Schlesinger’s letter (i.e., the one that had mentioned legal pricing policies and implied a requirement for U.S. government

⁴¹ The idea of discussing priorities in case of an emergency is interesting, because it foreshadows the agreement by Canada and the United States in CUSFTA to “share shortages” in energy under some circumstances – a stipulation that continued bilaterally after NAFTA was signed, but from which Mexico is exempt.

⁴² Mexico Cable 09384 (June 10, 1977).

regulators' approval of a private import agreement); but they surmised that "Financing of pipeline could be key subject since this may determine sources of much of the pipeline equipment due to the very rapid schedule Pemex has set. U.S. banks and Exim will need to move very rapidly if we are to get the largest share of the contracts." When pressed separately, the personal secretary to Díaz Serrano (Lic. Reynaldo Jauregui) "emphasized strongly that Pemex wants this meeting to take place outside of the auspices of the Economic Working Group of the U.S.-Mexican Consultative Mechanism. Stated reason was to avoid bureaucratic entanglements."⁴³

State Department cable traffic obtained through FOIA gave no additional detail about the content of these talks, but Warman says he does recall the June 27 Washington meeting well because he flew there aboard a Pemex plane. He says Díaz Serrano brought along "plans of the Gulf deposits" and referred to Mexico as "Saudi Arabia without sheikhs" – which caused Schlesinger to observe wryly: "Not yet!" Warman says there were discussions of a "sea route" for the gas pipeline, which might have meant earlier completion; but obviously that option was not pursued.⁴⁴

Now it was Oteyza's turn to be affronted by Schlesinger's casual manner. "He crossed his legs over the desk . . . like a cowboy!" Oteyza found this quite inappropriate "if I am a minister".

The 1979 chronology states that Schlesinger told Díaz Serrano and Oteyza on this occasion that "the USG [U.S. Government] would have to approve any pricing aspects of

⁴³ Mexico Cable 10020 (June 18, 1977).

⁴⁴ Díaz Serrano explained to the Chamber of Deputies on October 26, 1977, that a maritime route had been rejected (although it would have been completed more quickly) because it would have required "the use of specialized foreign ships" and replaced "the use of manual labor." A land-surface pipeline, he promised, would mean between 24,000 and 35,000 jobs for Mexican workers during its construction. (Moler-Bruce Study, Appendix B, pp. 110-111.)

such a project," noting that "there could be a problem if the price went above the \$2.16/Mcf paid for Canadian gas and the escalation were tied to #2 fuel oil prices in New York harbor."⁴⁵

Schlesinger says his reasoning here was both economic and political; and, in retrospect, it seems appropriate. However, the diplomatic/historical significance of this particular entry in the chronology goes beyond the question of whether his position was or was not correct. The very mention of such specific warnings by Schlesinger in June (if not before) shows that the framework of the gas deal that would be reached between Pemex and U.S. private-sector interests some five weeks later had been anticipated and was being questioned.

Although Warman cannot be sure it was at this meeting, he also remembers discussions with Schlesinger about distinctions between #2 and other types of oil that might be used as a benchmark for pricing natural gas. However, he says that at first he did not understand the significance of such details. He recognized only that President López Portillo was "set on \$2.60" as a price . . . and that a guiding principle in sticking to #2 (home heating oil) as the key future reference point for pricing natural gas (which itself was widely used in the United States as a home heating fuel) seemed to him to be that "bananas are bananas".

On June 29, Cecil Thompson led a four-person group from FEA and the U.S. State Department to Mexico City.⁴⁶ They met there with Warman and García Sáinz,⁴⁷

⁴⁵ Various entries in the contemporaneous collection of documents appended to the September 13, 1977 strategy memo support the Chronology's summary of Schlesinger's arguments at this time; and one of the "Issue Background" sections notes that in the June 27 meeting "Secretary Schlesinger specifically addressed the Mexican gas price issue." (Actually, Schlesinger was still "Secretary-designate" at that time; but his authority within the administration on energy issues was obvious. Then-FEA-Administrator John F. O'Leary is cited also in the strategy paper as viewing the pricing provisions of the August 3 Memorandum of Intentions "with concern" once its contents became known.)

even though Warman and Cecil Thompson had been present at the Washington meeting about prospective Mexican gas exports to this country only two days earlier.⁴⁸ The chronology says the purpose on June 29 was “to discuss natural gas”; but this is somewhat misleading. It was actually a planning session for the first formal meeting of the Subgroup on Energy, Minerals, Industry and Investment.

By this time it had been decided that this U.S. Sub-Group on economic matters would be co-chaired by Cecil Thompson and Deputy Assistant Secretary of State for International Resources Stephen Bosworth. As such they had jointly signed a letter on June 22 to their prospective Mexican counterparts, offering a list of discussion topics for an opening two-day session that they first proposed be held in Mexico during the week of July 11.⁴⁹ On June 25, U.S. Embassy officials reported that the Mexican co-chairs could still not be verified by name; but that Warman (who was preparing to leave for Washington for the June 27 meeting with Schlesinger) instructed them to deliver the letter to his own private secretary. “Given Warman’s lack of direct staff assistance and general organizational problems at this end” in regard to the Consultative Mechanism,

⁴⁶ State Cable 148766 (June 25, 1977) says they planned to be in Mexico City all day on both June 29 and 30. It names the other U.S. participants as FEA Associate Assistant Administrator James West, a member of State’s Economic Bureau (Pierce Bullen) and Frederick Cornelius of the Federal Power Commission.

⁴⁷ This was confirmed in a telephone interview with Cecil Thompson on July 17, 1992. Garcia Sáinz’ title within the Patrimony Ministry was “Under Secretary of State Industry”.

⁴⁸ The intended presence of Warman and Thompson at the Washington meeting on June 27 -- even though these two would be meeting again in Mexico City only two days later -- is confirmed by Mexico Cable 10608 (June 25, 1977). That cable goes on to say that Warman apparently thought Schlesinger would also come to Mexico for the session on the 29th, but Warman told me that he did not expect him to attend. Thus, we might surmise that the true purpose of the June 27 flight was to give Diaz Serrano a chance to talk with Schlesinger again face-to-face -- with Oteyza along to win the latter’s concurrence with the Director General’s approach.

⁴⁹ State Cable 145282 (June 22, 1977).

however, our Embassy thought the proposed date (i.e., early to mid-July) would be too early for a “useful meeting.”⁵⁰

Related trips by U.S. officials to Mexico would continue throughout the summer; and the Consultative Mechanism Sub-Group⁵¹ discussed more than natural gas. The agenda Bosworth and Thompson suggested for the first meeting in their June 22 letter also mentioned petroleum, exploration and drilling technology, energy efficiency, industrial development, investment climate, minerals research, and energy-related effects on the environment. But there is no doubt that the complexities of gas pricing were a topic from the beginning. In specific respect to Mexican gas exports to the United States the Bosworth-Thompson proposal highlighted “Institutional considerations . . . including the roles of the Mexican agencies involved and of the U.S. Federal Power Commission, State regulatory authorities, and companies.”⁵²

The response from Warman two weeks later was general and far-reaching; and it subordinated energy matters to a full-court-press agenda that would treat priorities in industrialization by sector, “modalities of North American investment in Mexico in those sectors”, employment, salaries, patent rights, tariff preferences, in-bond industries, the Multi-Fiber Agreement, migratory workers, and technological transfer – with specific emphasis on U.S. policies that hindered Mexican industrial development and what the United States could do now to help solve Mexico’s problems. “We do not see this

⁵⁰ Mexico Cable 10608 (June 25, 1977).

⁵¹ Besides Bosworth and Cecil Thompson, U.S. participants included James West (who had accompanied them to Mexico for the two-day talks earlier), Kay McKeough (who was then with the Treasury Department), a Deputy Assistant Secretary of State for Inter-American Affairs (Richard Arellano), a Commerce Department representative (Forest Abbuhl), and other members of the State Department’s Economic Bureau and Mexican Desk (Pierce K. Bullen and Edward C. Bittner). Embassy personnel also sat in on the talks. (per Mexico Cables 160884 – July 11, 1977, and State Cable 150747 – June 28, 1977).

⁵² State Cable 145282 (June 22, 1977)

Committee as one more step in eternal diplomatic discussions,” his letter said, “but as a first step of a new style of neighboring countries living together.”

Warman ignored the U.S. references to natural gas, and in fact did not mention hydrocarbon resources at all. His sole mention of energy had to do with “policies followed by the United States and their repercussions on Mexican industry”; but – surprisingly -- it called for analysis of “the energy policies of both countries and their possible coordination.” (emphasis added) And he concluded:

The emphasis as is obvious will be on the support that the United States can give to Mexico. It is not our intention to disguise it in a program of equivalent support. Given the inequalities of the economies of our countries it would be absurd to try for equal treatment, since it would only increase the inequality of the treatment. Consequently it is this asymmetry in the industrial relations of our two countries that must govern our attitudes. It is with basic frankness that we make it explicit.⁵³

The Under Secretary of *Patrimonio* was not talking about the desirability of “interdependence” but the unfairness expressed in “dependency theory” – the notion in vogue during the 1970s that less developed countries at the “periphery” were being held in thrall by one-way relationships with rich nations at the “center”.⁵⁴ By implicitly tying Mexican policy coordination with U.S. assistance, he was “playing the energy card” on Mexico’s behalf; and he admitted this to me when we discussed the incident.

I have discovered that this was not the first time a tit-for-tat arrangement on Mexican energy exports had been considered. Asked about a possible hint earlier (during the Ford administration) that discussions of a more forthcoming U.S. policy toward

⁵³ Letter from Natan Warman to Cecil B. Thompson (July 6, 1977). The original in Spanish was conveyed to Washington by U.S. diplomatic pouch; these quotes are from the Embassy’s immediate English translation, sent to the State Department within hours via Mexico Cable 11217.

⁵⁴ A classic in this case is Fernando Enrique Cardoso, *et al.*, *Dependency and Development in Latin America*, University of California Press (1979). What adds interest to this work for today’s readers is that by the time Cardoso became President of Brazil about two decades later he had become more or less an exponent of free markets in a capitalistic system.

Mexican immigration might accompany the establishment of Mexico as a secure source of oil, Warman said he recalled talk within Mexico during that period about sales to the United States; but he added quickly that not everybody in Pemex had favored the idea of oil exports at the time.

Warman explained to me that the policy Mexico had decided upon “way back” was not to become a member of OPEC (which presumably would have limited Pemex’s “control” of oil by yielding to joint decisions about production and exports) . . . and never to allow private “concessions” for oil development. Yet he also maintained that the *Patrimonio* Secretariat as a whole “was always open to the idea of joining the export of oil to the export of goods and people.” Apparently, he reasoned that using oil sales as a bargaining chip would not surrender control over the country’s patrimony.

As for the detailed agenda Warman forwarded to U.S. officials as a suggested structure for the June 29 talks in Mexico, he explained to me that the laundry list of topics had been assembled from many sources within the ministry, and that he expected meetings to take place quarterly (offering ample time for broad-ranging discussions). He says he even suggested to Foreign Minister Roel Garcia at one point that there was no reason why discussions about trade had to begin with conventional imports and exports of goods. “We can start with flows of labor and capital, rather than commodities,” Warman said.

Asked about the specific offer on his draft agenda to coordinate the energy policies of the two countries, Warman said he hadn’t been involved with that item personally at all, or even especially concerned with the possible gas deal – despite having been named Mexico’s co-chair of the meeting. As for the low placement of natural gas on

the list he proposed, Warman told me “We knew the U.S. had an energy preoccupation. We deliberately pulled it down on the agenda.” Warman himself was more interested in U.S. automotive policy. He recalled that Ford and General Motors were then required to compensate for imports from Mexico with overall exports – a situation he associated with the decision by U.S. auto manufacturers to begin building plants in Mexico.

Warman also had proposed that the Consultative sub-group hold its first meeting in Oaxaca (an ancient city rich in native Mexican heritage, but six or seven hours by car from the capital and lacking what the U.S. representatives considered reliable communication facilities). State Department Cable 159312 (July 8, 1977) gave instructions to accept that meeting site “if Mexicans stick with Oaxaca proposal”; but, after polite demurrals from the Embassy⁵⁵ the venue was switched to Mexico City and the dates of July 14-16 (Thursday to Saturday) were agreed upon.

When I spoke with Warman in 2003, he at first dismissed the idea that he had ever suggested Oaxaca as a site for the first meeting of the Sub-Group in late June, because he recognized the problems this would have entailed. When I assured him that the discussion of this location (on the recommendation of *Patrimonio*) was documented in U.S. State Department cables, he mused that someone might have proposed it because the government was anxious to try out a sequestered meeting site it had acquired in Oaxaca -- an interesting old convent that would later be re-privatized as the Hotel Presidente (now the Hotel Camino Real) in that city.

A U.S. team of 10 to 12 persons (including some from the Embassy staff) was promised for the first Sub-Group meeting; and a letter to Warman signed by Bosworth

⁵⁵ Mexico Cable 11239 (July 7, 1977).

agreed to include on the agenda all discussion topics Mexico had proposed – but combined with the items he and Thompson had suggested earlier, and with the understanding that there might not be time to discuss them “as fully as might be wished.” He asserted that “we will be ready to listen to Mexican views on all subjects with the expectation in some cases of responding to those views at a later date.” But he added that

Conceptually, we are sure you would agree that discussion of all topics to be raised must be based on the principle of mutual benefit. While we recognize that differing points of view may be involved, reflecting different levels of industrialization and other factors, it is important that our discussions consider issues where mutual interests are involved rather than anticipating an asymmetrical relationship. [emphasis added]

As to “the energy policies of both countries and their possible coordination”, Bosworth concluded with a reminder that

It would be timely for our delegation to explain the policies, procedures, and regulations governing US government approval of contracts for natural gas imports. While consideration of natural gas sales will of course go forward at its own pace, we believe it would be useful to take advantage of our meeting to further this ongoing process.⁵⁶

The DOE after-the-fact account says that on July 15 Thompson "explained in detail the USG regulatory policy on natural gas imports"; and this should have reinforced the cautions that Schlesinger had probably already given to Díaz Serrano more than once. A potential U.S. private buyer (either of foreign pipeline gas or LNG arriving from another country) would need Federal approval before any contract purchase could proceed. At the same meeting in Mexico City, Bosworth "stated that the \$1.75/Mcf proposed for new domestic gas and the price of Canadian gas were likely criteria against

⁵⁶ State Cable 159312 (July 8, 1977).

which gas import contracts would be reviewed."⁵⁷ After these summaries, the chronology entry for that date concluded with an exact (albeit ambiguous and somewhat unsatisfying) direct quote from the work program agreed upon at this meeting:

"The two governments will seek appropriate means to accelerate discussions of the proposal for the exportation of natural gas to the United States."

Warman's original suggestion about coordination of the two countries' national energy policies seems to have been shunted aside. Point 10 in the 11-point Work Program said only that "The two governments will continue their contacts to determine to what extent it may be useful to have continuing exchanges of views on energy planning and to have energy data exchange."⁵⁸

Meanwhile, however, discussions relating to the gas project multiplied. In a letter delivered by an Embassy official to Pemex finance officials on June 22, Exim expressed its "interest in supporting U.S. Steel tender for sale of pipe"⁵⁹; and the Bank's Chairman and President (John L. Moore, Jr.) had offered even earlier to accompany Crafton personally to Mexico City some time during the July 7-11 period to discuss "reasonable details" about the project and receive a formal application for credits.⁶⁰ Two other Exim representatives (Rengers and Mackenzie) were scheduled to visit Mexico City on August 7 for further talks, after touching base by phone with a member of the U.S. Embassy staff named Pascoe.⁶¹ According to a detailed article that appeared subsequently in a prominent Mexico City daily newspaper, *Excelsior*, U.S. Steel reviewed the Exim Bank

⁵⁷ When I interviewed Ambassador Bosworth by phone on July 17, 1992, he concurred in the opinion expressed to me by other U.S. negotiators that their Mexican counterparts must have understood the criteria for USG approval of any private contract to import Mexican natural gas.

⁵⁸ State Cable 168412 (July 19, 1977).

⁵⁹ Mexico Cable 10462 (June 23, 1977).

⁶⁰ Mexico Cable 133687 (June 9, 1977).

⁶¹ Mexico Cable 184508 (August 5, 1977).

credit requests from Pemex periodically and “even made some moves to have the requests handled as quickly as possible.”⁶² Thus, although the Export Import Bank was not part of the Consultative Mechanism, it instituted yet another parallel “track” for discussions of economic and technical feasibility of the gas-export pipeline. Although U.S. government “players” from various departments and agencies were involved, the address lines on the cables demonstrates that at least they kept one another posted on developments in the multi-pronged negotiations.

Meanwhile, Jack Ray was due for more surprises. As early as June 3, the U.S. Embassy expressed its belief that Tenneco “has just about nailed down contract with Pemex to act as project manager and designer,” although several Mexican construction companies would actually build the line.⁶³ By mid-June, the Embassy reported that Tenneco expected a contract within two weeks for both pipeline construction and the actual supply of gas.⁶⁴ There was vigorous international competition to supply the pipe itself, compressors, turbines, and other associated gear – with German, French and Japanese firms vying with those from the United States.⁶⁵ The tentative arrangement of loan-capital for the south-to-north pipeline had proved easy, however: U.S. financiers

⁶² Mexico Cable 20532 (December 9, 1977). Parts of this article in *Excelsior* seem to have been based on unsubstantiated rumor, because they were clearly erroneous; but this particular item is cited because it fits credibly into the pattern of events that can be documented otherwise.

⁶³ Mexico Cable 08837 (June 3, 1977).

⁶⁴ Mexico Cable 09707 (June 14, 1977).

⁶⁵ Mexico Cable 08837 (June 3, 1977) notes that German Exim interest was expressed through Tenneco, that Mitsubishi had already offered a turnkey contract for the whole project, and that a nephew of President Giscard D’Estaing came personally to press the case of Cofas (the French equivalent of the Exim Bank) – which, according to Pemex, had already opened an “unlimited” line of credit. That cable also reported that Mexico’s Altos Hornos was probably not capable of producing all of the 48-inch pipe itself in the tight time-frame and at any rate would have to import the right type of steel. On June 14, Mexico Cable 09707 (from which several lines were excised before release under the FOI) told State that Pemex had asked for bids on the pipe from “potential suppliers in the U.S., Canada, England and Japan”; but another cable a few days later (Mexico 10021 – June 18) quoted a U.S. engineer working with Pemex as confiding that the Mexican parastatal had probably just been “fishing for cost information”.

were convinced that the Mexican gas was there and so was the long-term market; almost any deal Ray might arrange would warrant their backing. But when he told Díaz Serrano this good news the Pemex Director General responded that he no longer needed intermediary help. On his own he had also discovered that Mexico's credit in international capital markets (long shaky) was now almost unlimited because of the country's new discoveries of scarce energy resources.⁶⁶

Furthermore, when Ray was summoned to Mexico for a command appearance to finalize an import agreement on August 3, Díaz Serrano forewarned him that a one-on-one deal with Pemex was no longer in the cards for Tenneco. Nor was there any room for negotiation about price or the conditions of its escalation.⁶⁷

Díaz Serrano told me that he was not personally present when six U.S. gas pipeline companies signed a Memorandum of Intentions for the joint purchase of 2 trillion British thermal units of Mexican natural gas per day (essentially the same as 2 bcf/d). The price was to be based on the energy-equivalent price of No. 2 fuel oil in New York Harbor -- i.e., then about \$2.60/Mcf, but subject to fluctuation with the world market for petroleum products.

⁶⁶ In fact, Mexico Cable 09707 had reported in mid-June that Díaz Serrano was already boasting to visitors that Pemex “will have no difficulty in borrowing all the funds it needs because of its ability to generate large quantities of foreign exchange rapidly.” By September 20, Mexico Cable 15775 was able to list hundreds of millions of dollars in low-interest loans and credits that Pemex or *Hacienda* (the Mexican Treasury Department) had already concluded or were negotiating with the Swiss, French, Japanese, and British. The Embassy cable concluded that “Financing could be key factor in selection of suppliers and US terms are being used to whipsaw other potential suppliers.”

⁶⁷ The U.S. Embassy seems to have gotten some advance inkling of a consortium deal, but barely ahead of the event. Mexico Cable 12850 on August 2 told State and the Treasury Department that Pemex “appears to be deciding against a single financial manager.” It also reported that “Pemex is planning to finance pipeline by borrowing against its balance sheet, rather than using an offshore company or some other gimmick.” (Earlier cables – Mexico 09707 of June 14, 1977 and Mexico 10462 of June 23, 1977 -- indicate that Pemex had floated various ideas for financing that might use a “shell” company in the United States to keep the debt off its own books . . . and perhaps also get around IMF limits on “public sector external borrowing”. The latter cable even cited a holding company scheme in which Pemex would hold only a 49 percent share.)

Ray told me that it was a "take it or leave it" offer; and Tenneco -- still offered the lion's share, more than one-third of the total contract -- took it. Later the Tenneco executive assured Congress that there had been tough negotiation and that the price was the best anybody could have gotten. However, Díaz Serrano implied to me that there had been little hard bargaining in connection with the signing: "Matter of fact," he told me, "the price of 2.60 was obtained by a conversation with Jack Ray" -- prior to the Memorandum of Intent.

State Department headquarters recognized instantly that the "pricing proposal poses serious problems" and reminded Embassy officials that they had been made aware of this fact. An August 5 rundown on the Memorandum of Intent⁶⁸ noted that Pemex wished pricing to be "based on price of No. 2 heating oil in New York Harbor" and gave a few more details. The actual six-year contract (with no firm starting date yet established) was to be negotiated by December, but the six companies would not decide until a meeting the following week how to counter the unpublicized Pemex demand that they arrange 500 million dollars of the pipeline's financing. Discussions between the Embassy's Economic Counselor and Pemex Finance Director Lic. Garcia-Torres the day before had yielded little information after Mexico City's morning newspapers had carried "garbled accounts of contracts". Garcia-Torres even said that he didn't know what volumes of gas were to be involved.⁶⁹ He did indicate, however, that Pemex was "most conscious" of the time requirements for Exim Bank action⁷⁰; and the cable reported that

⁶⁸ State Cable 184508 (August 5, 1977).

⁶⁹ Either Garcia-Torres was being disingenuous, he was playing with words, or the precise dealings Díaz Serrano was spearheading were still being kept secret -- even within the upper echelons of Pemex.

⁷⁰ One of the issue papers accompanying the September 13 strategy paper observed that if Eximbank's credit approval had not been presented to Congress by September 12, the requisite 25 legislative days for

Pemex “apparently signed letters of intent to permit U.S. gas importers to initiate price discussions with FPC.” [my addition of emphasis]⁷¹

The more highly classified message Warren Christopher conveyed to Secretary of State Cyrus Vance in his “evening reading” that night differed slightly from the “Limited Official Use” advisory to the Embassy, in that the former said the six U.S. gas transmission companies had been told to arrange about one billion dollars in financing as part of the purchase contract (rather than 500 million). The other language in the “Secret” cable was blunt: “We need the natural gas, but this price provision could cause problems, since we are now importing Canadian gas at dollars 2.16. We and FEA are considering how to intervene effectively with the Mexicans and the companies on the price question.”⁷²

A week later, the Embassy received instructions on which items of the Consultative Mechanism’s Work Program needed follow-up with the Patrimony Secretary “or other appropriate Mexican officials”. The U.S. government “would be happy to receive Mexican officials in Washington for further discussions” on a variety of topics, including “energy planning”. But the cable advised that “At this time natural gas exports (Item 6) are being considered in their own framework.”

On September 1, President Lopez Portillo discussed the proposed sale of gas to the U.S. in his annual *Informe* – the Mexican counterpart to our traditional "State of the Union" message; and the Embassy described his remarks as a strong attack on “criticisms

Congressional review would have delayed formal authorization until Congress reconvened in January. Backtracking the process, this meant the Bank’s Board of Directors had to consider the proposal by August 31.

⁷¹ Mexico Cable 12968 (August 4, 1977).

⁷² Message to Secretary 080144, passed along to the Embassy at the higher classification in State Cable 184548 (August 5, 1977).

of the proposed gas pipeline,” paraphrasing him to the effect that “Mexico’s petroleum reserves would enable it to pursue an independent economic policy.”⁷³

However, neither this initial characterization, nor the DOE chronology, nor most historical accounts of the gas negotiations call attention to the relevant phrases López Portillo may have actually used in that three-hour-plus address. According to a partial translation forwarded by the Embassy to Washington 10 days later, he announced that “We have decided to build a gas pipeline from Cactus, Chiapas, to Monterrey, with a branch pipeline that veers into Chihuahua, and eventually to complete the network with a pipeline to the capital and another branch pipeline to Reynosa for exports to the areas north of the border.” [my addition of emphasis] He went on to explain that Mexico’s “bonanza” of oil simply could not be produced without releasing associated gas. There would be “sufficient to cover all our needs and any foreseeable increases in them,” with “a great deal left over” to “either sell or burn off”.

The President said that selling the extra gas to “our closest customer by sending it through a pipeline” would “lower the cost of financing the pipeline to supply our northeastern states” and “save us the exorbitant investment” of cost and energy involved in converting it to liquefied gas for shipment elsewhere. Without even mentioning the United States by name, he wound up this section of his address⁷⁴ with the following words:

⁷³ Mexico Cable 14731 (sent very early on the morning of September 2, 1977).

⁷⁴ Fagen and Nau (pp. 398-9) assumed a different meaning because of the different translation of the President’s remarks they used. Theirs referred to “a spur” toward Monterrey, which they interpreted as “largely a bone thrown to nationalist statement.” Also, their translation indicated that López Portillo did mention the United States by name. At this distance in time from the event, we may never be able to establish which translation (and which interpretation) is closer to the truth; but I tend to trust the one I cite here. In a matter of such sensitivity, I believe Embassy officials would have been extremely careful in authenticating their translation . . . and surely would not have gone out of their way to avoid using their

We know that the right decision, the best solution for us, is to sell gas by pipeline. Not to do so simply because the buyer is our neighbor would be the sign of an unhealthy mentality and would mean a useless sacrifice the country has no reason to make.

Over the past forty years we have built up a store of experience in the petroleum field that enables us to enjoy considerable autonomy in our relations with other nations. We have no need for risk capital in the petroleum area, nor have we requested it.⁷⁵

The tone seemed to be half excusatory and half derisive. He was saying (in September) that the main purpose of the pipeline was to provide additional useful energy to Mexico's own citizens, and that any sales to the United States (as distasteful as they might be to some who recalled with pride the Mexican nationalization of oil four decades earlier) were an afterthought. There was no point in throwing money away.

On the day after the *Informe*, Díaz Serrano was given a "heads up" briefing by Exim's Crafton and Ambassador Lucey. He was told (but not for public announcement) that a total of \$590 million in U.S. government credits would be forthcoming.⁷⁶ Díaz Serrano welcomed the news and told Embassy contacts shortly thereafter that Pemex would start digging trenches for the pipeline in October⁷⁷, with the first 800 million cubic feet of gas per day scheduled to start flowing through it under "natural pressure"⁷⁸ in January 1979. He also remained adamant on the price arrangement Pemex had demanded in the Memorandum signed with the six private companies. An Embassy cable on the night of September 9 said that Diaz Serrano "is aware of the problems this may cause

own country's name. One plausible explanation is that there was a discrepancy between the President's speech "as prepared for delivery" and "as given".

⁷⁵ Mexico Cable 15287 (September 12, 1977).

⁷⁶ Mexico Cable 14985 (September 7, 1977)

⁷⁷ Fagen and Nau (p. 396) wrote that construction on the southernmost leg of the *gasoducto* did indeed begin on October 7, but that Díaz Serrano did not announce this to the Mexican Congress until October 26, 1977.

⁷⁸ This would have required some adjustment before gas was fed into the pressurized pipelines in the U.S. system. Furthermore, 1200psi compressors would be required throughout the Mexican pipeline to reach its intended full capacity of 2.3-to-2.5 bcf/d.

with the FPC⁷⁹ but feels this is a matter that U.S. purchasers can resolve without the need for direct GOM or Pemex participation before a foreign regulatory agency.”⁸⁰

On September 9, the Export-Import Bank notified Congress of its intention to provide credits to help fund \$400 million in U.S. exports for the pipeline from southern Mexico to the U.S. border,⁸¹ and here is where political barriers to the deal became public in both countries. Senator Adlai E. Stevenson III (D. Ill.), who headed an oversight committee, objected to the price specified in the Memorandum of Intentions on the same grounds Schlesinger had cited. But Stevenson announced that he would introduce a “sense of the Congress” concurrent resolution that the Exim credit not be extended until the Secretary of Energy had approved the price to be paid for the pipeline gas and Congress had been assured of the “reasonableness and fairness” of the Mexican prices in light of what U.S. producers and Canadian exporters to this country were getting.⁸²

The Mexican press, *The Washington Post*, and Jack Ray of Tenneco (among others) expressed outrage – despite the fact that such a resolution would carry no real teeth, since it was not in the form of a statute. Its background -- coming more than five weeks after Exim's notification -- remains both hazy and puzzling. Many at DOE suspected then that it was drafted as a negotiating ploy by Assistant Secretary Leslie J. Goldman (a former Stevenson staffer who had come to the new department from an interim post as Assistant Administrator of FEA). However, its origin and true intention

⁷⁹ When the Department of Energy was born on October 1, 1977, many of the activities and powers of the Federal Power Commission were assumed by the new Federal Energy Regulatory Commission (FERC). The DOE Chronology says that at this point Schlesinger also delegated his authority to regulate gas imports to the Economic Regulatory Administration (ERA) within his new department.

⁸⁰ Mexico Cable 15144 (September 9, 1977).

⁸¹ Eximbank financing may be used only in connection with U.S. exports. As it turned out, no U.S. firm was capable then of supplying the very large diameter pipe to be used in this project; so the value of the disputed credit would probably have been less than it seemed to either side at the time.

⁸² Fagen and Nau quote the resolution at greater length on pp. 404-5.

are moot. Exim officers continued to visit Mexico to iron out details⁸³; and on December 15 the Board of the Eximbank told Pemex of its approval for the credit application if "binding contracts" were developed. Even though Senator Stevenson had written a letter to the editor of *The Washington Post* a few days earlier defending a \$1.75 price as appropriate, he indicated he was satisfied with the Exim Bank's stipulation (which meant that any contract would have to be okayed by the new Economic Regulatory Administration within DOE). Yet David Bardin, who had headed ERA at the time, told me in a face-to-face interview on July 15, 1992, that the matter never actually reached him officially. This suggests that the mid-December message from Exim may really have been a way of confirming the U.S. government's most recent negotiating offer -- developed in meetings with Warman before he was removed from the negotiations, and which Schlesinger and others thought had been accepted in Mexico.

Negotiations about the gas price and its future link to some escalation formula (the real sticking points⁸⁴) had obviously continued through the fall. Goldman told me that he must have made a total of at least half a dozen trips to Mexico in connection with this issue during 1977 -- although (maddeningly) FEA and DOE files that might support this recollection cannot be located and apparently were not preserved.

Periodically, Díaz Serrano stiffened his own negotiating stance. Five weeks after López Portillo had informed his nation that Mexico intended to export gas to the United States, the Pemex chief told Ambassador Lucey that U.S. Steel Corporation would get a

⁸³ State Cable 256206 (October 26, 1977).

⁸⁴ State Cable 246976 (October 15, 1977) contains one of several references I found to contract length as another source of disagreement. Pemex resisted a supply commitment beyond six years (with an option to renew for another six), but this cable noted that "the U.S. prefers a duration of ten or more years for gas contracts, in part to amortize investments in additional facilities to distribute the gas and to provide at least medium-term security of supply for U.S. users."

smaller share of the pipeline order than it had hoped for and that current plans were to terminate the line at Monterrey.⁸⁵ This was technically consistent with the President's characterization of the segment to the border as an eventual spur; but the tone of expression (as reported by the Embassy) seemed harsher. About the same time, Oyetza told Lucey that price matters should be settled between Pemex and the six U.S. companies (which, he acknowledged, could "obtain whatever guidance or clearance was necessary from the [new] Federal Energy Regulatory Commission".⁸⁶ And on October 26 Díaz Serrano "strongly defended Pemex's plans to build the Cactus-Reynosa pipeline" before the Mexican Chamber of Deputies but "insisted that the line would stop short of the border if the USG did not approve a price of \$2.60/mcf."⁸⁷

An English translation by the Congressional Research Service of the full Díaz Serrano speech text (as published in the Moler-Bruce Study) shows that he also mentioned the contractual time-limit of six years for gas sales to the United States. He said this would be "renewable once for six more years, in case it is suitable to Mexico."⁸⁸ [emphasis added] He also flaunted the flag for the legislators, noting that "we are weak compared to our neighbor," but . . .

The muscles of our anatomy are petroleum; let us exercise them for the well-being of our life and health, for the improvement of our national cohesion, to assure ourselves an eminent place among nations.⁸⁹

Yet Diaz Serrano admitted his understanding that "A fundamental condition of these arrangements is the acceptance on the part of the American government of the

⁸⁵ Mexico Cable 16768 (October 7, 1977).

⁸⁶ Mexico Cable 17705 (October 22, 1977).

⁸⁷ Mexico Cable 18217 (November 1, 1977).

⁸⁸ Moler-Bruce Study, p. 115.

⁸⁹ Moler-Bruce Study, p. 119.

prices at which *Petroleos Mexicanos* wants to sell its gas” and “we still do not know what the decision of the American authorities will be . . .”⁹⁰

The September strategy memo shows that there were initial differences between the State Department and FEA/DOE in both objectives and approaches. Yet it stretches credulity to suggest that the parties on the Mexican side did not perceive by this time that the Memorandum signed in August could not be the last word on a gas deal . . . and that Schlesinger was not able to act unilaterally.⁹¹ Unfortunately, the chronology is highly selective as well as garbled in some respects; but an entry for late November 1977 suggests generally the sorts of discussions that were going on. It is so poorly expressed, however, that it seems best not to try to interpret it precisely but just to quote it verbatim:

November 21: A State/DOE group led by Deputy Assistant Secretaries Bosworth and McDonald⁹² met with National Patrimony Under Secretary Warman and other Mexican officials⁹³ in Mexico City they stressed the export contracts would be subject to the joint approval of U.S. regulatory authorities but suggested that the two governments seek to agree on general policy parameters on pricing and other key provisions matter which Pemex and the U.S. companies could then conduct the outlined negotiations of the contract.

A much clearer idea of the U.S. message delivered on that date can probably be gleaned from an earlier “Confidential” cable addressed to “Chief of Mission from Todman and Katz”⁹⁴, which seemed to give Lucey his marching orders.⁹⁵ It said that

⁹⁰ Moler-Bruce Study, p. 117.

⁹¹ In late October (according to Mexico Cable 17931 – October 27, 1977), Ambassador Lucey resisted a request from Exim Bank President John Moore to tell Díaz Serrano flatly that credits would be held up pending settlement of the gas-price issue. Lucey sought guidance in a phone conference with U.S. Under Secretary of State for Economic Affairs Richard N. Cooper the next day, but I failed to find out what he was told. The State Department’s immediate response may have been contained in a cable that the FOI process either failed to locate or determined not to declassify.

⁹² Stephen W. Bosworth represented the State Department, Walter McDonald the Department of Energy.

⁹³ On November 12, Mexico Cable 18942 had reported that Oteyza was open to the November 21-22 government-to-government discussions so long as Mexico was represented in them by *Patrimonio* and the talks were distinct from company-to-company meetings between Pemex and the private U.S. firms.

⁹⁴ This chapter was also reviewed in near-final form by retired Ambassador Terence Todman, who found it to be a comprehensive, accurate, and fair account of events as he recalled them.

contract duration and gas price would have to be “approved by USG. This was made clear to the Mexicans on such occasions as Díaz Serrano-Schlesinger conversations in Washington and meeting of Energy Subgroup of Bilateral Mechanism in Mexico City in July. You should stress this again to Mexicans, as well as related need for USG-GOM discussions on these issues.”

Yet the cable continued, expressing the State Department’s opposition to Senator Stevenson’s proposed resolution and revealing its efforts to have him drop the idea. While sharing the Senator’s concern over the gas-price issue and announcing plans to “discuss it directly with GOM”, the cable-directive reiterated that the Exim Bank authorization process should “proceed normally” . . . because “no Eximbank disbursements would take place until USG has approved overall import contract.”
[emphasis added]

Although Oteyza had told Lucey about 10 days earlier that the Mexican team would be headed this time by García Sáinz (whose portfolio at *Patrimonio* at least included oil and gas), Warman once again was in the lead position and García Sáinz apparently did not even attend. The other participants similarly were skewed toward general industrial development rather than the pipeline project. They were Ambassador Manuel Armendariz Etchegaray (Director-in-Chief of International Economic Relations for the Foreign Ministry), *Licenciado* Vladimiro Brailovsky (Director General of Industrial Policy for *Patrimonio*), and Hector R. Lara Sosa (who was with Pemex, but as Deputy Director of Industrial Production). Nevertheless, the U.S. delegation repeated earlier objections to both the base price and the link of future price to #2 oil in New York

⁹⁵ State Cable 268778 (November 10, 1977).

Harbor. Instead, they suggested escalatory mechanisms tied to either U.S. domestic gas prices or the U.S. GNP deflator.⁹⁶

Jack Ray of Tenneco protested the U.S. negotiators' position almost immediately in a letter to Ambassador Lucey (perhaps with a copy to the State Department in Washington). He deplored what he called "an effort to retrade a commercial natural gas contract which was negotiated in good faith"⁹⁷ State Cable 282783 (November 26, 1977) responded with the observation that the purpose of the consultations in Mexico City had not been to negotiate a contract but to set out on a government-to-government basis the bounds within which the companies could negotiate if they wished to avoid long delays or failure in the USG contract approval process.

The next entry in the DOE chronology, for November 30, says merely that "State Department and DOE representatives met with representatives of the six companies which had signed the Memorandum of Intentions." This is confirmed by State Cable 288255 (December 2, 1977); but the far more significant part of that cable was a marked softening of the U.S. position in an effort to find common ground. At this stage, State was willing to seize on the words by which Warman had relayed Oteyza's rejection of the Bosworth-McDonald suggestion of November 21 – namely that "Mexico could not sell its gas at less than the prices paid for Canadian and Algerian gas imported into the US."⁹⁸

The advisory continued:

You may say that, while we continue to have difficulty with a price above that allowed for new US domestic gas production, we understand that it may be difficult for the Mexicans to agree to a significantly lower price than that received by other exporters of natural gas to the US.

⁹⁶ Mexico Cable 19429 (November 21, 1977) and State Cable 282783 (November 26, 1977).

⁹⁷ Mexico Cable 19640 (November 25, 1977).

⁹⁸ As reported in State Cable 282783 (November 26, 1977).

However, on the following day (December 1, 1977), Mexican President López Portillo was quoted by *The Washington Post* as saying that Mexico saw no reason for negotiation on this aspect of a private contract. He said the country would not lower the price of its gas, even if this jeopardized U.S. financing for the pipeline. Yet Lopez Portillo continued to express disbelief that questions about gas price could really block financing for the pipeline. “I know Mr. Carter,” he told his journalistic questioner. “I know his government, and I am certain this has not happened and am absolutely certain that it will not happen.”⁹⁹

Warman also thought there might be an opportunity for an agreement; and it appears that one was reached tentatively in early December – although my various sources vary on how and when the presumed breakthrough took place. According to Warman, he invited Bosworth one day to “have a drink or a coffee at the Hotel Geneve”, where Warman explained that his instructions were “not to reduce a penny” from the \$2.60 price . . . “or the pipeline is not built”. He went on to speculate, however, that perhaps some arrangement naming that price could be made through a planned and announced escalation that might involve the “wholesale price index . . . or terms of trade”. Warman says Bosworth told him that such an approach “looks interesting”. But “the very next day” Warman was removed from the negotiations – “by direct presidential order”, according to him.¹⁰⁰

⁹⁹ Marlise Simons, *The Washington Post* (December 1, 1977, p. D-3.). Lopez Portillo’s boast of good relations with the U.S. President makes it logical that he or his representatives would have sought Carter’s personal intervention following the unsatisfactory outcome of the December 21 meeting with Schlesinger if the Mexicans had not already decided to break off negotiations.

¹⁰⁰ Almost inexplicably, the DOE chronology reports none of this – except to say that on December 7 (which may or may not have been the correct date) “Bosworth and McDonald again met with Warman to continue the discussions begun on November 21.”

A succession of cables indicates that Bosworth and McDonald (along with Richard Goodwin of the DOE General Counsel's office) met with Warman on December 7 to continue the discussions begun on November 21. This is consistent with the DOE chronology, although that document curiously gives no further detail. The U.S. team planned to arrive in Mexico City late on the evening of December 6, stay at the Hotel Geneve, meet with Warman and others at government offices on December 7, and return to Washington at 9:30 a.m. on December 8. Yet a memo prepared for Secretary Vance less than two weeks later says the State/DOE negotiation team met again with their Mexican counterparts in Mexico City on December 8.¹⁰¹ It went on to say that this time they had offered the latter the choice of two compromise options on the gas price: 1) The Mexican-calculated price of \$2.60 per mcf, but to go into force only when gas began flowing in substantial volume (expected to be 1980), with an escalation thereafter on the basis of the U.S. wholesale price index; or 2) a price of \$2.16 (matching the current Canadian level), starting in 1978 and escalating thereafter on the basis of the same U.S. wholesale price index. Either was viewed as giving Mexico "political cover" by jacking up the price – either to the exact dollar value demanded originally (albeit on a delayed basis) or by equating the Mexican price immediately with the Canadian price at the time. In either case, though, the United States would not pay such a high premium immediately and Congressional objections could probably be overcome.¹⁰² Perhaps of comparable importance was that the future price of gas would be controlled largely by free market

¹⁰¹ This memo was Bosworth's report on the December 21 meeting in Schlesinger's office. Conceivably, Warman and Bosworth met for an early morning coffee, the day after they had had formal talks.

¹⁰² Briefing Memorandum for Secretary Vance (December 20, 1977) in preparation for his meeting the following day with Foreign Secretary Roel.

forces within North America rather than by a pinpointed product price (#2 oil in New York harbor) that depended on what OPEC decided to charge for its crude.

Regardless of who originated the potential compromise, I could find no record of a formal Mexican response; and Secretary Vance would be told later that President Lopez Portillo “felt Under Secretary of Patrimony Warman was too forthcoming in his November-December meetings with us.”¹⁰³ This suggests that Warman might have been pulled off the negotiations on December 9, without any notification to U.S. officials.

Although Oteyza disputed the idea that Warman had been fired because of being “too forthcoming” (since he stayed on in his Under Secretary post until the end of the *sexenio*), he admitted that Warman might have been removed from participation in the gas negotiations. That would not have meant much of a change in terms of actual power though, he said, because “he wasn’t [ever] in charge institutionally.” In respect to President López Portillo’s direct involvement in Warman’s shift, however (as well as in the break-off of negotiations around the end of 1977), Oteyza found this perfectly credible. “López Portillo didn’t like the United States,” he told me firmly. “On the other hand, Díaz Serrano was pro-American. They had two visions.”

On December 9, *Excelsior* carried a lengthy and somewhat inflammatory story about the cancellation by Pemex of its contract to buy 80,000 metric tons of pipeline steel from United States Steel Corporation – a purchase order the article described as the second largest that firm had received all year. The story described “panic at the highest levels of the corporation” and blamed the cancellation on Senator Stevenson’s blocking of the Exim credit, an action that it claimed Energy Secretary Schlesinger had instigated.

¹⁰³ *Ibid.*

It also boasted that the necessary financing had been approved by the French Foreign Trade Bank, appeared to be available from Japan (a country smarting under President Carter's protectionist measures), and might also be offered by the governmental Corporation for Export Development (CDE) in Canada – whose Ministry of Industry, Commerce and Trade had apparently just been petitioned by Roel Garcia.

Although the article mentioned a Pemex deadline of December 31 “for the U.S. oil companies to present plans for the marketing of Mexico's natural gas which were convenient to Mexico's interests”, it added that “Pemex and the consortium will sign the contract on the marketing next week, according to official information from the oil companies.”¹⁰⁴ The *Excelsior* correspondent (Fausto Fernandez Ponte) seemed to accept the fact that the contract terms on a “pegged” gas price would be adhered to, despite Schlesinger's success “in having the State Department put pressure on U.S. oil companies and on Pemex” to accept “a fixed price” – as opposed to “the fluctuating price of this product in the international market”.

Senator Lloyd M. Bentsen (D., Texas) was cited as having “denounced the draft resolution as a maneuver on the part of the United States government”, and Schlesinger was cast in a nationalistic light that reflected the “energy independence” themes of earlier Presidents Nixon and Ford. The Secretary was said to have told a “seminar” of U.S. oil company directors that “the United States would not tolerate dependence on natural supplies from other countries.”¹⁰⁵

¹⁰⁴ *Excelsior* was less optimistic that day on its editorial page, suggesting that the pipeline might not be built.

¹⁰⁵ Excerpts from the article are based on what was presented as a verbatim translation in Mexico Cable 20532 (December 9, 1977),

To complicate matters, Ambassador Lucey was becoming panicky. He had called John Moore, urgently requesting a phone conference on December 8 and pleading that the Exim financial package be handled without reference to the dispute over gas prices. Unless he could assure Díaz Serrano of this within days, Lucey foresaw “serious and adverse consequences in the short and long term for U.S. national interests and for the interests of American business as well.” He cited specific concerns by executives of General Electric Corporation, which stood to lose a \$72 million contract if the pipeline stopped at Monterrey because equipment they expected to supply would be unnecessary to move the gas only that far.¹⁰⁶

Apparently, Lucey received the assurances he wished, because a later cable reports that “Díaz Serrano seemed pleased” when he was informed on December 15 of the Exim Bank’s approval, “tied only to firming up of contract between Pemex and American oil companies.”¹⁰⁷

On December 16 (again according to the chronology), Foreign Secretary Roel García told U.S. Assistant Secretary of State for Inter-American Affairs Terence Todman that Mexico had no intention of budging from the price arrangement outlined in the August 3 Memorandum, but that President López Portillo had suggested that the Minister and Díaz Serrano go to Washington to explain this position. This is what happened five days later -- in the famous confrontation with Schlesinger.

Schlesinger agreed here with the chronology that "The U.S. reiterated its earlier views and a willingness to discuss issues further." In fact, he insists that he thought by

¹⁰⁶ Mexico Cable 20241 (December 6, 1977) and Mexico Cable 18166 (October 31, 1977).

¹⁰⁷ Confidential cable sent on December 16, 1977, from Lucey (at the U.S. Consulate in Hermosillo) to Boswell.

this time a compromise was all but assured. He recalls that it would have provided a gradual but definite rise in the price of imported Mexican gas to \$2.60 -- the "magic number" on which Mexican officials had staked their prestige, and he thought that he had also proposed yet another possible form of regular escalation -- namely, that the initial price would keep pace subsequently with the price of No. 6 fuel oil in the Southwestern United States.¹⁰⁸ Other former DOE officials who were involved in the negotiations preceding this meeting confirmed Schlesinger's basic recollection -- that a new deal had been offered and that the U.S. side had the impression that it had been accepted.

By this time, Lucey also thought that the Mexicans were about to agree to a fairly long-term contract with the terms, prices, and escalation factor Bosworth had outlined to the ambassador in Mexico City on his December visit (presumably after the final Bosworth-Warman discussion). Lucey took as a signal of Mexican readiness the fact that Díaz Serrano and Mexico's foreign minister (rather than Oteyza or Warman) "are now willing to be directly involved with Dr. Schlesinger." He had decided that "the negotiation with Patrimony might in fact be a useless form of shadow boxing." Lucey saw Díaz Serrano as "a tough businessman of vast experience" who "will bargain hard", but "is prepared to compromise in the interest of continuity" because "we are in the final analysis the only market for this huge quantity of gas."¹⁰⁹

¹⁰⁸ This offer of an alternative basis for escalation was not mentioned in the only contemporary documentation of the December 21 Schlesinger meeting I was able to locate (a Briefing Memorandum for Secretary Vance prepared on the same day the meeting took place). It was signed by Julius L. Katz, who told me before his death that he would vouch for its contents although he had not been present at the meeting himself. He knew that the memo had been prepared by an actual witness to the meeting, whom he recalled to be Bosworth; and I determined subsequently that Bosworth had indeed been the author.

¹⁰⁹ Mexico Cable 21092, from Lucey to Bosworth (December 20, 1977). This cable refers to an evaluation of the situation Lucey had made to Bosworth in a cable from Hermosillo on December 15; but slightly more than half of that message was excised by State Department reviewers before releasing it to me. My presumption is that it may have contained a further, unflattering (and perhaps indiscreet) description of how

The meeting of the Mexican officials with Schlesinger had been moved back from December 20 to the next day at Roel's request and subsequently from 9 a.m. to the early afternoon of December 21. Roel had also set up appointments that day with Secretary Vance at 11:30 and Vice President Walter Mondale at 3:15. The night before, they had paid a courtesy call on Exim Chairman Moore (during which State Cable 008812 – sent December 12, 1978 – says Díaz Serrano did most of the talking although he referred frequently to Foreign Minister Roel as the “team leader”). In reference to the Vance meeting, State Cable 309658 reported to Ambassador Lucey on December 29, 1977, that Roel and Diaz Serrano had told the U.S. Secretary of State that the pipeline would end at Monterrey unless a price of \$2.60 was approved. Vance and Mondale had both been advised by staff to respond on December 21 along the same lines Schlesinger was using if Roel broached the topic. Mondale was preparing to visit Mexico in late January, and a briefing memo sent to the Vice President by Warren Christopher two days after the Roel visit to Washington mentions “ongoing discussions with the Mexican government on [natural gas] prices and other proposed terms” – with no hint of an interruption to the gas-import negotiations.

The December 21 meeting with Schlesinger took place at 1 p.m. in the West Wing of the White House, where he maintained an office for some time after the new

Lucey thought *Patrimonio* had played its part in the negotiations. (Oteyza, in turn, told me that he had not considered Lucey a very good ambassador.) Lucey, who told me that he had eventually resigned his ambassadorial post in part because of differences with President Carter and his policies, was unable to add much to what I had already learned by the time I finally tracked him down for a phone interview in June 2004. After supporting Senator Ted Kennedy's bid to replace Carter as the Democratic presidential nominee in 1980, Lucey himself ran for vice-president that year as John Anderson's running mate on an independent ticket. Lucey then seemed to vanish, even eluding my searches via the Internet until I learned his current whereabouts by chance through a mutual acquaintance. By then, however, the 86-year-old Ambassador (although still apparently in good health and spirits) was unable to recall details of the negotiation and told me he did not even remember Oteyza.

Department of Energy began operating in the Forrestal Building. When I spoke with them separately more than 10 years ago, Schlesinger and Díaz Serrano themselves were both indistinct as to exactly what transpired; but neither man painted as violent a picture as did some subsequent secondary accounts. Nor did the straightforward memo drafted that same day by Bosworth (the State Department note-taker in the Schlesinger meeting) and sent to Secretary Vance by Assistant Secretary Julius Katz. It says that Schlesinger reiterated the arguments U.S. representatives had been making for months, but also pointed out specifically that “nowhere in the world do producers get BTU value for natural gas.”

Even in the unregulated US intrastate market, the average price for natural gas is currently only about \$1.75 to \$1.80 per mcf. With regard to the U.S. gas companies, Schlesinger stressed that they participate in a regulated industry in the US and that any import contracts must be approved by US regulatory authorities.

Roel had come to Washington to discuss such matters as tomato exports, undocumented Mexican workers in this country, and the situation in Belize with his own U.S. counterpart, Secretary of State Vance. His participation in the Schlesinger meeting was on orders from his own President, however, even though Warman says that the Foreign Office had generally not followed oil and gas matters. Thus, it is no surprise that Bosworth reports Roel “continued to push for a price tied to the cost of number 2 fuel oil . . . rising as the OPEC oil price rises.” The Foreign Minister said that “Mexico would have great political difficulty accepting a lower price and argued that the US gas companies with whom the Mexicans have been negotiating the actual supply contracts are willing to accept the Mexican price formula”. He added that Mexico could use the gas for fuel domestically, rather than export it to the U.S.” (although the meeting memo

surmised that “Roel is probably as aware as we are that the economics make it much more advantageous to sell its gas to the US.”

Oteyza was not present at this meeting; but during my 2003 interview with him he volunteered to me his opinion of Roel: “Santiago Roel was a very pragmatic man, but not a diplomat. Maybe he was not the man for that position!” As Oteyza continued, he seemed to be implying some blame on Roel for the negotiations’ interruption in 1977. “During the [Lopez Portillo] presidential campaign, we never thought he [Roel Garcia] would be foreign minister. His successor, Castañeda, was successful” [in subsequent negotiations for the sale of Mexican gas to the United States, at a higher price than originally requested].

So far as I can tell, it was only after the December 21 session that Díaz Serrano first expressed publicly his own displeasure with Schlesinger’s informal mien. Based on my discussions with Schlesinger, the U.S. Energy Secretary probably did prop his feet up on a desk or coffee table once again during that meeting -- not exactly ideal decorum for discussions with a delegation that included a Foreign Minister, an Ambassador (Hugo B. Margáin), and the lead man at Pemex (who was considered by some likely to become Mexico's next President).¹¹⁰ On the other hand, Schlesinger was not meeting with them for the first time; and, as a person who had held numerous other top government positions himself (Secretary of Defense, Assistant to the President, Director of the Central

¹¹⁰ Although most of Ambassador Lucey’s recollections were vague when I finally located him in June 2004, he said he “remembered well” Roel Garcia’s complaint to him afterwards that Schlesinger had not even bothered to stand up when the delegation entered his office, but had kept his feet propped up throughout the meeting. Lucey described his own relationships with Roel Garcia as “buddy buddy” and those with Díaz Serrano as always friendly and relaxed. Lucey volunteered parenthetically that Roel Garcia and Ambassador Margain (whose position Lucey described as nearly equivalent to that of his nominal boss, the Foreign Secretary) did not like each other and had trouble getting along.

Intelligence Agency, Chairman of the U.S. Atomic Energy Commission), he may have thought the informality would be viewed as engaging.

That is not the way Díaz Serrano told me he saw it.

"He was looking to me sideways," the former Pemex chief recalled, ". . . trying to show his superiority." In light of the fact that Díaz Serrano was "representing my country . . . not representing a private company," he termed the U.S. cabinet officer's behavior "patronizing" and "condescending".

Undoubtedly, Schlesinger realized that the meeting had gone badly. Yet he scoffs at the idea that the Mexicans "stormed out of his office" as has been reported. "They may have left in a huff," he told me -- without belaboring this subtle distinction.

The overriding fact is that the Energy Secretary and Bosworth both thought the Mexican officials would be back. Schlesinger was puzzled (and perhaps annoyed) that what he had been told earlier was an acceptable deal had fallen through. Yet he expected the negotiations to continue. This is confirmed by Bosworth's Briefing Memorandum: "There was no agreement on next steps. Roel said the Mexican Government would have to study the situation."¹¹¹ And, as late as January 6, 1978, the U.S. Embassy in Mexico City was given "press guidance" that "Nothing that has happened so far forecloses the possibility of further negotiations."¹¹²

Jack Ray knew better -- within minutes after the Mexican officials left Schlesinger's office. Two aides to Díaz Serrano (who had not been in the meeting

¹¹¹ *Ibid.* Katz had appended his personal advice to Secretary Vance: "I believe we should now wait to hear further from the Mexicans. They have had a firm restatement of our position, and the next move in effect is up to them." (Indeed it was!)

¹¹² State Cable 003385 (January 6, 1978). This "Limited Official Use" cable also denied categorically any link between the gas price negotiations and President Carter's program to curb illegal immigration -- a tie that had been alleged by Mexican media.

themselves) came to Ray's hotel to report that everything was off.¹¹³ Ten days later (December 31) Pemex allowed the Memorandum of Intentions to expire. In a series of announcements, the Mexicans made clear publicly that they would expand their own domestic consumption of natural gas instead of selling the fuel to the United States. Construction on the pipeline continued; but just north of San Fernando it jogged to the left – toward Monterrey. For years thereafter, some Mexicans referred to this sarcastically (and unfairly) as “the Schlesinger Loop”.

The Moler-Bruce Study stated with undue humility in 1979 that “This paper will be obsolete before it is printed.”¹¹⁴ In the case of specifics about the energy market and the industry, that is undoubtedly true. But a quarter century of additional research (even including the latest releases of material) has done little to alter the perspicacity of one observation about the effort up until then to establish a working bilateral relationship on natural gas:

Every Mexican official interviewed expressed displeasure with the manner or style with which the Letter of Intent was handled by U.S. regulatory authorities. Meanwhile, virtually every U.S. regulatory official complained that neither the U.S. companies nor the Mexican officials paid sufficient attention to the regulatory hurdles facing any proposal to import natural gas into the United States.¹¹⁵

The Players, Their Interests, and Their Relative Power

With diverse interests represented on each side, it is not surprising that the initial efforts to reach an agreement on large-scale imports of Mexican gas into this country

¹¹³ Ray identified them to me as “de Leon and Chavarria”. According to Ray, both men later became fugitives from Mexican justice and were reported subsequently to be living in South America. Ray's story of being notified promptly through a “back channel” was echoed by Kay McKeough, who told me Ray had given her a similar account during her subsequent employment by Tenneco.

¹¹⁴ Moler-Bruce Study, p. 3.

¹¹⁵ Moler-Bruce Study, p. 79.

failed. The Bilateral Consultative Mechanism tried to do too much at once, with no structure or basis for establishing priorities and reaching agreement; and increased trade in natural gas, for all its potential significance, was by no means its exclusive concern. In fact, it was not even the sole focus of the relevant Mechanism Subgroup – whose Mexican leader had little grasp of energy issues. In addition, relations between the United States and Mexico were far less comparable to those between the United States and Canada than they would become. Finally, the pipeline proposal itself – which historically was a bold one for Díaz Serrano to initiate and López Portillo to acquiesce in -- called for simultaneous evaluation on economic, technical, political, and legal grounds; but there was no way (or incentive) to coordinate all these elements. Many of the individuals involved seemed to wear blinders to its complexity.

Prior to my interview with Díaz Serrano (and long before I had access to the contemporary State Department documents), I had authoritative assurances that López Portillo had "blessed" the \$2.60 price demand that caused so much difficulty.¹¹⁶ Yet the Director General told me that his President had not studied the gas deal in detail and was merely willing to trust the judgment of the man he had named to head Pemex.

Furthermore, López Portillo himself had brought mutually hostile forces into his own cabinet. The men around him were fundamentally all his friends, but in some cases uncomfortable with each other. Patrimony Minister Oteyza regarded Díaz Serrano (technically his subordinate) as a free-wheeling rival . . . and Foreign Minister Roel as poorly qualified for his job. This poses an interesting parallel between López Portillo and his counterpart in the White House. The widely different views and styles of Jimmy

¹¹⁶ Interview with Juan Eibenschutz in Mexico City, August 6, 1992.

Carter's National Security Advisor (Zbigniew Brzezinski) and Secretary of State Cyrus Vance were apparently known to the President before he appointed each one. The pull and tug between them contributed to the image of a vacillating and unpredictable presidency. In energy matters, however, Carter seemed to place primary trust at that time in Schlesinger.

The most powerful forces on the Mexican energy scene in 1977 recognized at least three distinct and not always fully compatible missions: For Pemex the goal was to produce and profit. For most of *Patrimonio* it was to protect and develop. For the Foreign Ministry it was to project national interests internationally.¹¹⁷ Each of these forces became involved in one or more of the negotiating tracks detailed in this chapter. Ultimately, however, López Portillo was the overriding determinant. Mexico was less of a unitary state in the late 1970s than it seemed to most U.S. observers (including such astute players as Schlesinger and Bosworth); but it was still possible to reserve final decisions on matters of this type for "the presidential channel". Confidential State Department summaries of a meeting between Vance and Roel in New York on September 27, 1978, and a session with Díaz Serrano in Mexico City at almost the same time indicate that neither Mexican official could have reopened the long-lapsed gas negotiations without a specific okay from López Portillo.

Of course, if the Mexicans had wished to press their case in December, 1977, they could have appealed what they interpreted as Schlesinger's intransigence to higher

¹¹⁷ In this respect, Andrés Rozental told me at our first meeting that the overriding importance to the Foreign Ministry of U.S.-Mexican relations could hardly be exaggerated. Ambassador Lucey assured me that he had had access to President López Portillo whenever he wanted to see him. And when Lucey had protested once that the time pressures on Roel Garcia clearly justified his delegation of some routine matters to a subordinate instead of handling them personally, the Foreign Secretary's response was: "Eighty percent of my job is to maintain good relations with the United States. I can't delegate that!"

authorities then. Instead, it appears that they did not even bother to mention it to Vice President Mondale that same day. Nor did they ask for a personal meeting with President Carter immediately after the session with Schlesinger. Robert A. Pastor, who was then Director of Latin American and Caribbean Affairs on the National Security Council, has told me that such a meeting could surely have been arranged upon Díaz Serrano's request.¹¹⁸ On the other hand, one U.S. official who took part in most of the extensive negotiations during 1977 found it easy to understand why the Mexicans might have been reluctant to press Schlesinger at this point. Kay McKeough told me that the new Energy Secretary was widely regarded by that time as "Carter's boy" in such matters . . . so she thought it could have been assumed that challenging his position would accomplish nothing.

We should keep in mind that -- for all his swagger -- Díaz Serrano was never a completely free actor. He was under presidential orders to earn hard currency that Mexico needed desperately for national development. The country's key export was oil – clearly available in enormous surplus quantities; so the additional petroleum resources that had just been discovered would be a financial bonanza if the oil could be produced expeditiously. One barrier to high oil production was the Mexican petroleum workers union itself (whose penchant for featherbedding was legendary, yet which had enough political clout to have been the instigator of the foreign oil industry seizures some decades before). The second problem, as suggested above, was the unusually large quantity of natural gas associated with some of Mexico's early offshore oil strikes. It would be embarrassing (as well as wasteful and environmentally insensitive) to continue

¹¹⁸ Phone interview, July 20, 1992.

burning it off; but oil production (and oil-export earnings) could not be boosted dramatically unless excess gas came along with it. Díaz Serrano solved the first difficulty by daring to bring in U.S. drilling technology and expertise (placating the unions, most believe, by arranging side-payments). He proposed to handle the second by setting up pipeline sales of gas that would boost export earning even more. This too was a somewhat daring tactic.

In opposition to this idea, Patrimony Minister (and *ex officio* Pemex Chairman) Oteyza insisted that Mexico's true national interest lay ultimately in developing and employing all hydrocarbon resources by and for itself. Some oil might have to be sold abroad in the short run in order to finance Mexico's industrial growth, but cooperation with the United States ought to be avoided even in that regard – lest Mexican economic independence be compromised by undue reliance on a single customer with a tradition of bullying weaker nations. The leftist Oteyza (whom Díaz Serrano denounced as a Communist when I mentioned his name) would later swallow his ideological antipathy and back Miguel de la Madrid in order to remove any chance that Díaz Serrano might succeed López Portillo as President of the Republic. Oteyza was neither the only nor the most vocal opponent of the proposed U.S.-Mexican gas deal on his side of the border; but he symbolized those who wished to "protect" this mineral treasure at that time rather than barter it to Yankee capitalists. They won by default.

In the late 1970's, Mexico's career diplomats (who included Rozental, but not Roel) envisioned a task that was broader and more complex than that of either Pemex or *Patrimonio*. They saw Mexico's new potential wealth (from both oil and gas) as a

foundation from which to project a more imposing international presence.¹¹⁹ If some of the previously poor (and still militarily weak) members of OPEC had new-found ability to twist the tails of the "Great Powers" with impunity, why shouldn't Mexico be able to negotiate with the United States on a more nearly level field? To the Foreign Ministry in general¹²⁰ the proposed gas deal was a mere sidelight to wider economic relations with the United States (including the terms of ongoing petroleum exports). It was only one of many bilateral negotiations underway. Equal or greater weight lay with other issues -- such as the freer sales of farm products and the critical question of labor movements across the border. The prospect of Mexican gas sales thus might be dangled as a carrot or pulled back as a stick; but in either case Foreign Ministry careerists saw it more as a device of international persuasion than a do-or-die element in itself.

If this third Mexican view of the 1977 gas talks appears more relaxed than most accounts would suggest as appropriate, it still probably comes closest to the general U.S. attitude toward the deal at the time. With everything else that was afoot, the mass media in this country (and thus most citizens) largely overlooked these particular negotiations -- including their upsetting December climax. Meanwhile, the entire administration of U.S. energy policy was being restructured . . . and thus in turmoil.

This does not mean that those who were aware of the talks were not vigorously and emotionally involved at times. And it certainly does not imply that there was general

¹¹⁹ Under the Fox administration this remains a prime consideration, as evidenced by Mexico's interest in membership on the United Nations Security Council. Career diplomat Rozental has continued as a special ambassador, and his half-brother (Jorge Castañeda) was Fox's original Foreign Minister. However, Ambassador Rozental has been a champion of close cooperation among the NAFTA countries in many fields, including energy, without surrendering Mexico's independence of action.

¹²⁰ The Foreign Minister himself is not as easy to characterize as Díaz Serrano or Oteyza. Schlesinger is convinced that Roel's business associations in the Monterrey area influenced his diplomatic actions, but this conclusion may not be totally objective.

accord as to what the U.S. position should be. The "players" here had definitely "chosen up sides". In fact, this was merely the continuation of a game (arguments about proper U.S. "energy policy") that had begun decades before.¹²¹

As far back as the 1940's, oil-rich States pressured the Federal government to limit the volume of petroleum imports because marginal U.S. producers could no longer compete with cheap oil from the Middle East. At the same time, however, there was consumer insistence that foreign oil be allowed onto the market in order to hold prices down. After the Phillips Decision opened the door to Federal regulation of interstate gas prices, the stage was set for regional schizophrenia about this fuel in particular.

Nationally, the Energy Crisis evoked by a tripling or quadrupling of prices in the mid-1970's had wrought economic havoc; but the effects in different geographical areas were startlingly varied. Some suffered while others smiled quietly; and sentiments in the country were divided between "energy-poor" and "energy-rich" States. Louisiana, for instance, was producing more than four times as much mineral energy in 1976 as it needed to satisfy its own needs . . . while Delaware and Rhode Island produced essentially none.¹²² Louisiana gas producers were more than willing to step up their "exports" to other States -- if Federal authorities allowed them to collect what the national market could bear (unhindered by Federal price ceilings). But "consumer protection" held firm -- for the moment at least. No wonder New Orleans traffic saw a popular new bumper sticker slogan: "Let the Yankee bastids freeze in the dark!"

¹²¹ For a description of continuity and conflict in U.S. policymaking, see Joseph M. Dukert, "Development and Implementation of National Energy Policy," Working Paper #92-1, Washington Consulting Group, June 1992.

¹²² The situation is discussed in more detail in Hans H. Landsberg and Joseph M. Dukert, *High Energy Costs: Uneven, Unfair, Unavoidable?* Johns Hopkins University Press, Baltimore, 1981 (especially pp. 40-43).

The U.S. Congress, of course, reflects U.S. geography – especially in the Senate. And so it was that a new Civil War raged there over the suggestion made during the 1976 presidential campaign that perhaps -- just perhaps -- it might be appropriate to ease up on Federal energy regulation.

Even among those who were willing to set aside the inexorable laws of supply and demand just for energy, there were differences in approach. The battle was between the principle of central control (in order to fine-tune domestic supply and ensure "equity" for consumers) and the conflicting conviction that we could never "get prices right" without some uncensored signals from the market. As often happens, the outcome of the struggle within the U.S. government involved a little bit of each -- but not enough to satisfy either side. The Natural Gas Policy Act of 1978 (NGPA) emerged as a compromise late in Carter's second year of office, setting the stage then for a resumption of U.S.-Mexican gas negotiations under a totally different set of circumstances.

NGPA was a step in the right direction (moving gradually toward market pricing) . . . and perhaps the longest stride that could have been taken politically in this country at the time. But it was also a legislative monstrosity – aiming to micromanage gas prices over a period of years in a host of different categories, depending on such distinctions as the age of the producing fields and the types of production technology used.

NGPA was only one of a bundle of legislative reforms that Schlesinger was trying to accomplish -- under direct orders from President Carter. This preoccupation helps to explain why Schlesinger did not devote more personal attention to the Mexican negotiations, and it was also one reason he was loath to see import prices reach a level that might upset the domestic price agreement he was mandated to elicit. Nevertheless, he

has admitted to me that he should have taken time to visit Mexico personally during the 1977 negotiations.

An additional factor was the character of James Schlesinger himself -- brilliant but brittle, insightful but impatient. The occasional result within the bureaucracy (even among dedicated and capable public servants -- careerists or political appointees) is exemplified by one occasion when he asked the new DOE Policy Office for an economic analysis of the pending gas negotiations -- on the assumption that everyone on "our side" was thinking along the same lines. The paper was prepared and submitted to the Secretary through channels; but he returned it with a wry and revealing comment. The cost-benefit analysis had apparently been well done, but it was aimed at explicating the highest price this country could afford to pay -- all things considered. I have been unable to find the document; but its initiator (Henry Santiago, now retired from DOE) claims to recall the Secretary's response clearly: "Very interesting. But what I want to know is the lowest price the Mexicans can afford to accept -- all things considered." (An analyst of bargaining processes might submit that it is ideal to know both when that is possible; but this is rarely the case, and this particular situation was unusually complicated.)

The U.S. gas industry represented another major force in the 1977 negotiations; and it generally favored total price deregulation. The statement must be qualified because this industry is far from homogeneous; and some of its segments at times have contradictory economic interests. Gas producers wished to see wellhead prices rise from their artificially depressed level. Pipeline companies wanted greater assurance that there would be ample supplies of the commodity they were paid to transport; and this was also likely to result from deregulation. On the other hand, local gas distribution companies

(LDC's) saw a mix of costs and benefits. Deregulation could mean that they might have to accept somewhat lower customer demand (especially in relation to competing energy sources) if prices went up; but it also promised more reliable supply, and this is an important point for publicly regulated utilities -- enjoined to provide a community service as a "natural monopoly" in return for the opportunity to earn a target rate of return-on-investment. For those LDC's that took a longer perspective, an end to shortages might also mean that their State public utility commissions (PUC's) would relax bothersome restrictions on the addition of new customers -- a serious competitive problem.

Tenneco was both a producer and a pipeline company. Its top officials may well have anticipated that complete deregulation was in the cards in 1977, and they surely would have welcomed such a bold political move. At any rate, if \$2.60 deliveries of gas from Mexico (tied to the escalating price of imported oil) became a *fait accompli*, Tenneco knew it would be harder for U.S. government figures to argue logically against deregulation of domestic production. Meanwhile, consumers and sellers of gas would be protected by the "roll-in" provisions on pricing. If gas was obtained from a number of sources at various prices, these costs could be averaged. Besides, public utility commissions around the country offered an extra layer of protection for consumers of natural gas who had the loudest voices and who exercised the most intra-state political clout. PUC's have great latitude in setting differential rates for the various basic categories of gas customer: residential, commercial, industrial, and electric utilities (not to mention those subsets willing to settle for "interruptible" service).

The role of Ambassador Lucey (and his staff) comes through in the internal U.S. exchanges as enigmatic, but it probably contributed little to the course of events. The

Embassy almost invariably seemed to champion the cause of U.S. commercial interests (of both the pipeline companies and the potential suppliers to the pipeline construction project) rather than macroeconomic and political considerations that Washington made clear. Lucey personally appeared anxious to placate Díaz Serrano, and several times he either proposed acceptance of the Mexican stance or raised questions about USG positions -- to which headquarters in Washington paid scant heed.

It has become conventional wisdom that Pemex (and the Mexican negotiators generally) did not appreciate the limits of power for a U.S. President and his cabinet officials. In light of their own nation's tradition of a very strong chief executive, one can understand their skepticism that U.S. Federal legislators and lobbyists -- and even forces at the State level -- could conspire to block a national administration in coming to a deal.

In addition, the Pemex decision to insist on partners for Tenneco in what became the Border Gas Consortium reflects some understanding of U.S. political realities. In my interview with him, Díaz Serrano himself cited two reasons for this approach: 1) to protect himself from charges on either side of the border that he had set up a sweetheart deal with a single U.S. company, and 2) that "we wanted the people in the United States from the North, from the South, the East and the West, to benefit from the production of gas in Mexico. . . . Particularly California. Because of the large Mexican population that there is in California."¹²³ It might also have been a shrewd political ploy, aimed at winning support for the deal from a broader geographical base within the United States. If this were the case, it would be clear that the Pemex players knew (or at least sensed) that Schlesinger did not have a free hand.

¹²³ His critics have mentioned another possible reason -- a chance to develop the profitable friendship of six companies instead of one.

The fact that Díaz Serrano mentioned Mexicans living in the States also raises the possibility that he was aware of some of his own Foreign Ministry's concerns -- such as U.S. immigration policy and the treatment in that country of migrant workers. As a rule, Mexican diplomats favored linkage among issues raised in bilateral negotiations, while the U.S. Department of State then seemed to prefer discussing each item on the U.S.-Mexican agenda individually.

That brings us to some brief economic comments.

The Economics

Apart from political considerations, the U.S. government had several valid economic reasons to oppose the contract terms Pemex had offered on a take-it-or-leave-it basis. When a possible compromise developed late in 1977, a few weeks before the talks were suspended, it is also hard to explain (once again, from a purely economic standpoint) why Mexico refused to budge even a trifle.

Schlesinger's blockbuster economic argument was the immediate effect on the total U.S. gas-import bill from what an unsophisticated observer might have considered a small price-concession in the Mexican negotiations. This was brought out rather placidly later in several Congressional hearings and studies; but its logic never quite reached the mass media -- who were busy with energy hassles of the moment or willing to perpetuate the popular (and credible) story that Schlesinger had acted only out of pique.

If a contract had been signed in 1977 for \$2.60 Mexican gas, Canadian exporters could have forced their price (then \$2.16 per mcf) up to the same level. However, that jump would apply at once to roughly a trillion cubic feet of Canadian gas that was then

being imported annually. Schlesinger quickly became aware that Mexico's deliveries for the first three years (i.e., before the completion of the huge new pipeline) could probably be no more than about 50 million cfd from its northern fields. Thus, the United States would be acquiring some 18 billion cubic feet of additional gas per year (less than two percent of current imports from Canada) while adding nearly half a billion dollars to its annual trade deficit. By today's standards, that may seem trifling in the aggregate; but the marginal cost of adding each unit of one thousand cubic feet of gas from the southern source would not be \$2.60, but actually more than \$24 – which seemed ridiculous. Besides, Canadian gas was expected to remain more important in the long run than the 730 bcf per year that Mexico said it wished to deliver eventually.

It would be economically reasonable for the United States to pay some premium to compensate for a reduction in supply risk. Part of the appeal of buying energy from Mexico was that it was not a member of OPEC (even though Mexican officials followed the announcement of extensive new hydrocarbon discoveries in the 1970s with indications that they would not torpedo world oil prices or risk domestic inflation by expanding production precipitously¹²⁴). The prospect of maximum Mexican gas exports for only three years, however, offered relatively low security – especially since Mexico hedged its guarantee with an escape clause linked to domestic requirements and stated

¹²⁴ According to the Moler-Bruce Study (p. 42), López Portillo proclaimed on January 5, 1979 – shortly before President Carter's visit to Mexico City to talk about energy, among other things : "We will not increase oil input more than the planned growth of our economy permits. We will establish a growth rate of 7 or 8 per cent and fix oil production levels in relation to this. But we can't just say: 'Good, we have oil. Now let's sell it madly.'"

flatly that a single six-year contract renewal would depend on whether the national administration succeeding Lopez Portillo's in 1982 decided it was convenient.¹²⁵

There was another reason to accept a slightly higher price for natural gas overall; and Schlesinger was willing to permit such a move as part of the National Energy Plan he and Carter were busy trying to enact. Higher returns on domestic exploration and drilling could give U.S. producers more incentive to develop and utilize whatever "resources" they might turn into "reserves" as price controls on interstate gas were eased. But tying gas prices irrevocably to a product such as heating oil in New York Harbor, whose own price could be manipulated directly by OPEC, made little sense. Even with the geographical distribution Pemex had tried to arrange, none of the Mexican product would have reached New England. The link in value to "#2 in New York Harbor" was tenuous, to say the least.

Natural gas and oil are not perfectly fungible energy sources. The degree to which the former can substitute for refined versions of the latter depends on end-use. In the northern United States during 1977, most gas was used as a fuel for space heating. Thus, Canadian gas piped across the border was replacing light #2 oil -- the type used in home furnaces. In the Southwest, by contrast, the Administration assumed that only a small part of any gas imported from Mexico would either replace home heating oil or be used in oil-fired combustion turbines for the generation of electricity (another use of #2). Schlesinger

¹²⁵ Mexico Cable 10019 (June 17, 1978) reported a conversation Ambassador Lucey had with John Jacobs, Keith Dickinson, and Jerry Verkler of Texas Eastern, in which the officials of that pipeline urged acceptance of all the Mexican contract terms that the Federal government had declined -- despite Lucey's protestation at that stage that subsequent Mexican Presidents might "be pressured to negotiate a stiffer contract until the gas was no longer commercially viable." The pipeline people admitted that Pemex had cancelled an earlier 20-year gas contract with them "because the north of Mexico was short of gas" but said this only demonstrated that "If at some time in the future Mexico again runs short, the contract term will be of little consequence." Their attitude (supported perhaps by success with "roll-in pricing") was that they "would always be able to negotiate a viable contract."

reasoned that the additional gas there would be used to replace the heavy, "residual" oil fraction that was burned as an industrial fuel or under Southern boilers in a different type of oil-fired generating plant (which the Administration eventually tried to convert or eliminate completely). In either case, the gas added marginally would substitute for the product the industry knows as "Number 6" -- which typically sold at a discount of 25 to 35 percent to the price of #2.¹²⁶

There are other -- more arcane and subjective -- arguments that might be pressed. Heating oil (like diesel fuel) is a refined product; so its cost (and thus, indirectly, its price) is affected by considerations that go far beyond the wellhead price of crude. Furthermore, upon delivery at the U.S. border, Mexican gas also faces higher transport costs to market than would #2 oil in the Port of New York, which is close to demand centers.

From this country's standpoint, it seemed less pressing by the end of 1977 to "lock in" gas imports from Mexico on terms that clearly would have involved some economic loss. With a new department in place to focus on problems and the prospect of a halting and long-term move toward a freer market, the domestic supply of gas ended its four-year decline in 1977 and stabilized -- at least until the bottom dropped out of energy prices and the "gas bubble" appeared.

¹²⁶ This is my own observation, based on scanning EIA data for the period. The price of heating oil varies seasonally and regionally in the United States, besides being affected by the plethora of state and local establishment of rates for different categories of users (which, in turn, influences demand and supply). Diesel fuel, which has been used both in vehicular transportation and the generation of electricity, is subject to comparable variations; and the same is true to a certain extent of Number 6 -- the availability of which fluctuates because it is truly a residual fuel (left over at "the bottom of the barrel" after refiners have drawn off the lighter fractions of hydrocarbon whose relative proportions are dictated by feedstock, equipment capabilities, and sale opportunities at a given time and place).

Schlesinger had ample justification for believing that Mexico could afford to accept some modifications in contract terms. Díaz Serrano boasted in his October 26, 1977, speech to the Chamber of Deputies that the price the U.S. companies expected to pay was the equivalent of 2.12 pesos – eight times the 26 centavos Pemex was charging Mexican industry.¹²⁷ He went on to say that Pemex would be exporting only the 60 per cent (by weight) of Mexico's natural gas that was chemically pure methane (the basic ingredient in heating fuel). Mexico would retain for its own national use the 40 per cent content of natural gas liquids, which Díaz Serrano described as “the real and most important source of raw materials for petrochemistry”.¹²⁸

Accepting the December 8, 1977 compromise on price might have cost Mexico little. Assuming that López Portillo had chosen the option of matching Canada's price for the first three years, the total difference in receipts at first would have been less than \$8 million annually if one assumed stable prices for Number 2 heating oil. Actually, the average price of that product roughly doubled over the period (which still would have made for a fairly small windfall); but that was due to an unforeseeable event, the overthrow of the Shah of Iran. Schlesinger's premonition about the relative price of Number 6 was sound; its increase was substantially less.

¹²⁷ The following year, the U.S. State Department's Economic Bureau reported on a Pemex presentation to the International Energy Agency's Standing Group on the Oil Market that emphasized Mexico's “policy of meeting domestic demand at subsidized prices” while stressing its “intent to convert large fuel oil consumers to gas, thereby freeing fuel oil for export, unless satisfactory arrangements are reached to export gas to the U.S.” Pemex explained its mission as “exporting large volumes of crude and product to meet Mexico's revenue needs.” (State Cable 164300, June 28, 1978.)

¹²⁸ Translated text in Appendix B of Moler-Bruce Study, p. 112. To make sure Washington officials had not missed this in the lengthy speech, the U.S. Embassy in Mexico City highlighted these points in a brief summary – with instructions to pass it along to the Exim Bank, DOE, and FERC. (Mexico Cable 18217, sent November 1, 1977.)

Nevertheless, the Mexicans were not being foolhardy from an economic perspective to take a hard line entering the December 21 meeting with Schlesinger -- fully prepared, in fact, to break off negotiations rather than yield an inch on their earlier proposal. Díaz Serrano knew by this time that he did not absolutely need U.S. financing. Roel García was not an energy expert; but his knowledge of industrial and business prospects in the Monterrey area enabled him to envision how rapid development could spring from a domestic energy source that could be made available cheaply. Export earnings need not even suffer, because substituting gas for oil domestically would make more of the latter commodity available to sell on the world market -- where OPEC could probably be trusted to keep prices high, and where Mexico could reap large profits automatically as a "free rider" -- rather than eking them out through international negotiations on its own.

Some people in the field who are knowledgeable about Mexican affairs have told me they are dubious that the breakoff could have been anticipated by the Pemex leader, but they hold this view on political rather than economic grounds. They contend that he lost face when the deal fell through (and, indeed, he was lampooned in some parts of the Mexican press after the event . . . and finally went to jail instead of becoming President). Nevertheless, although his President's intransigence was not part of his original plan, Díaz Serrano could easily have calculated that his standing up to the Yankee bully would be a political plus in the long run -- especially if Pemex oil production stayed high (as it did) and a nationalist appeal could be added to the economic one. In economic terms, completing the pipeline only as far as Monterrey at this point saved a great deal of money (because extra compressors would not be needed) and time (which mattered a great deal

to Díaz Serrano, because it meant Pemex could more rapidly boost its production of both oil – the real moneymaker – and associated gas).

In 1978, the tone of López Portillo's September 1 *Informe* in connection with natural gas became much more belligerent; and the U.S. Embassy expressed alarm that the President "placed Mexico's energy policy in the context of the struggle for a 'New International Economic Order'".¹²⁹ The "NIEO" had become shorthand for serious power-sharing between developed and undeveloped countries on the basis of higher value being assigned to oil and other critical natural resources. López Portillo's message to the world stage was that "We have maintained our unshakeable desire to give raw materials their true value. Neither now nor in the future will we sabotage the efforts of those who like ourselves are fighting for this."¹³⁰ He also had a more direct challenge to the United States: "Our potential and our geographic location are such that our position as regards fossil fuels can represent a pressure of worldwide significance."¹³¹ [Emphasis added.]

In retrospect, it seems that the United States could have found some "better way out". For example, my own unorthodox proposal would have been to allow the imports by Border Gas at any price it was willing to pay -- but with the stipulation that the price could not be "rolled in". This would have meant that the imported product could be sold only to end-users who were willing to pay a high marginal cost; and such a stipulation should have averted an across-the-board increase in imports from Canada. Such an arrangement might have proved technically difficult to implement (although no more

¹²⁹ Mexico Cable 14511 (September 2, 1978).

¹³⁰ Official English translation, quoted in Mexico Cable 147843 (September 8, 1978). Interestingly, the English version of the same presidential address Moler and Bruce included in their study as Appendix D was based on translation from a live recording and thus had some gaps. The phrase "nor . . . will we sabotage" was rendered as "nor will be [word indistinct] against".

¹³¹ *Ibid.*

complicated than the pricing rules that were adopted later under the Natural Gas Policy Act); but there were almost certainly some consumers to whom the price could have been justified on the basis of assurance in fuel supply. Still this further step toward freeing up the market at that time might have been opposed too -- on ideological grounds, through jealousy, or because it was just too complicated to understand. In any event, Dr. Schlesinger has told me that this particular tack was never proposed (although at least one former aide claims that it would have been considered if there had been time and a propensity for fuller consultations within the new Department).

If, as quoted earlier, Díaz Serrano really felt that Pemex had to depend on export income to supply half of the \$15 billion it needed to grow, he must have counted on selling natural gas as well as crude oil. Prior to the fresh jump in world oil prices that accompanied the unexpected Iranian coup in 1979, Mexican oil coming into the United States brought less than \$14 a barrel. In those days, Mexico seemed willing to export only 18 to 23 percent of its total domestic production to the United States; but even if we assume Díaz Serrano was ready to sell off half of Pemex' output on a regular basis it would take production capacity of roughly 3 million barrels a day to yield \$7.5 billion of total revenue over a year. Mexico would not reach that level until the mid-1990s. By contrast, natural gas seemed like an instant "cash cow". Sending 2 billion cubic feet per day by pipeline into the United States at \$2.60 per mcf would generate a revenue bonus of about \$2 billion annually -- in return for what had been regarded as a waste product!

As things turned out, neither the United States nor Mexico suffered any serious economic damage from the collapse of the talks in December 1977. Forced to find an alternate use for the pipeline (which was already under construction), Mexico

concentrated on promoting its domestic use of natural gas in the north. The compulsory experiment succeeded, and the nation's industrial sector in particular prospered as a result. In fact, as noted earlier, Mexico has become such an eager consumer of natural gas that it is now a net importer from the United States. Yet this has occurred only because the framework for continental trade in gas and electricity was ready to emerge during the 1990s. Having given the necessary background for understanding, the final section of this chapter can summarize what had to change for that to take place.

Absence of the Regime's "Necessary" Factors

Looking back at the details of the U.S.-Mexican gas talks in the late 1970s (and their relationship with U.S.-Canadian energy trade then) makes one realize how thoroughly the setting for comparable negotiations was revolutionized over the next 10-15 years. As a counterfactual exercise, one can imagine circumstances under which the original purchase deal might have gone through – for better or for worse. Modifications of a few individual personalities and attitudes would have sufficed to accomplish that. But the contract would not have been enough in itself to encourage a regime to evolve; and -- without joint acceptance of principles, rules, norms, and decision-making procedures -- chances are good that the contract between Pemex and the Border Gas consortium would have been voided as soon as perceptions of national interest changed on either side (just as Mexico had renounced its earlier agreement to supply Texas Eastern with gas for 20 years).

The North American gas-and-electricity regime has come into place to promote and sustain continental energy interdependence . . . because all three countries now

recognize this condition to be in their respective national interests. These are not just altered perceptions; the opportunity for great mutual benefit through energy interdependence was simply not present in 1977-78. Circumstances then would not even have permitted us to talk honestly of a North American energy market, with a composite framework of regulations that offers some substantial degree of certainty to investors. The reason Canadian gas prices affected the terms of a U.S. gas deal with Mexico at that time was not genuine source-vs.-source competition, but the *ad hoc* agreements then in place.

Even though the gas negotiations described above took place between only two of the three countries of North America and applied directly to only one of the two energy sources that fit into the new regime that is the subject of the dissertation, it is interesting to reconsider the old gas-trade arena briefly in the light of what I have called the “necessary and sufficient” elements for the regime’s development.

The first “necessary” element listed in Chapter V was a lowering of barriers to the movement of both gas and electricity across North American borders. The steps taken in this direction since the late 1970s would have been enough by themselves to eliminate government-to-government involvement from the old gas deal almost entirely. Although Pemex was and still is a state-owned entity, it now operates in pretty much the same way a large private corporation such as Exxon or Shell would in so far as cross-border trade goes. From the United States side, the National Energy Policy Act of 1992 ended the need for importers of gas to get DOE approval for such commercial activities. There are no quantitative restrictions in either direction, and of course tariffs have been eliminated under NAFTA.

Supply competition at the wholesale level (the second necessary factor) could not be effective in the United States before the 1980s and 90s, but it certainly is now. It has also been introduced into Mexico by the very fact that Pemex no longer supplies all of that country's requirements for natural gas. The Baja California peninsula and many of the new customers for natural gas across the rest of northern Mexico depend now in whole or in part on imports from the United States. The imminent addition of LNG receiving facilities on both coasts of Mexico will only sharpen the recognition of competition among alternative sources – both in price and reliability of supply. But this changes the entire framework of contract negotiation. Automatic escalator clauses for price – and even very long-term contracts – are looked at differently now than they were then. This is due in large measure to the emergence during the 1980s and 90s of both reasonably efficient spot markets and the opportunity to hedge against price and supply risk through futures markets – which are subsumed in my third “necessary” factor.

The fourth factor enumerated in Chapter V involved restructuring of the gas industry (at least conceptually) into the distinct functions of production, long-distance delivery, and local distribution) and the coincidental convergence of the markets for gas and electricity. These developments were not even foreseen in the late 1970s, yet they are the solid basis of seasonal and regional trade in both gas and electricity that permitted private investment in Mexico's energy sector and spawned the cross-border networks of energy transmission (which produced “ratcheting” and made the thought of withdrawal from the regime impractical, even among political “dinosaurs” or violent nationalists). Incidentally, these changes have also diminished the clout of Pemex – which is far more

constrained now by CRE, an obstreperous multi-party Congress, and the newly significant Supreme Court than it was by *Patrimonio*'s shaky ministerial oversight.

Energy discussions that took place 25 years ago within a Subgroup of the Bilateral Consultative Mechanism were feckless in comparison with what has been achieved within the North American Energy Working Group. But, as has been pointed out, NAEWG could hardly have been established if the confluence of NAFTA, “deregulation”, and changes in the energy market had not set the stage. In place of inchoate discussions, these developments recommended a new set of working sub-groups -- each with a sharper focus.

The Epilogue of Fagen & Nau's chapter on the aborted effort to forge a U.S.-Mexican gas connection a quarter century ago concluded with a thoughtful yet wistful observation:

Supply, demand, and prices, however, are far from the only relevant factors. As the *gasoducto* story reminds us, deals like the Northern connection are not made or unmade solely in terms of one or another version of economic rationality. Rather, here as throughout the energy field, politics is very much in evidence. And given the complexity of the politics practiced both north and south of the border – not to mention internationally – only time will tell how, when, and by whom the next attempt to forge a Northern connection will be made.¹³²

One of the useful appendices in the Moler-Bruce Study is a commentary on broad ramifications of Mexico's new oil and gas riches. Among other things, it cites a report that had just been completed by National Economic Research Associates, a Washington think tank. Apparently, NERA thought then that what was needed was “a North

¹³² Fagen & Nau, p. 427.

American energy policy, under which Mexico and Canada provide the resources and the United States provides the market.”¹³³ I respectfully disagree.

Mexico and Canada would have resisted such a simplistic structure then and would find it unattractive today. Besides, it might make for continual tension and friction among the three countries as conditions shift within the energy world. The beauty of the regime we have is that it furthers the goals of three separate national energy policies and it can adapt as those policies and the forces acting upon them change.

Chapter VII will discuss how such policies are determined and implemented. The final chapter will treat sources of the flexibility within the regime that promises it longevity.

¹³³ Moler-Bruce Study, Appendix E, p. 154.

VII. DOMESTIC PERCEPTIONS OF NATIONAL INTERESTS

Systemic Determinants of Energy Policy

Continental energy interdependence is a force that guides some important, broader relationships for Canada, Mexico, and the United States – with one another, with other nations, and with other country groupings (such as OPEC and IEA). Obviously, additional forces continue at work – in North America, for the Western Hemisphere, and within the global community of nations. One thing that deserves to be stressed is that the continental energy relationship and the worldwide geopolitical system operate in different ways. Participation in the gas-and-electricity regime by each of these three countries is self-motivating, rather than being the result of power relationships among them.

Many regional and systemic interactions do rest on relative power, and survival within the international structure overall is always the overriding national interest. Therefore, the neorealist world image remains valid in assuming that the distribution of power (and cyclical changes in relative power) may have fundamental effects on how nation-states interact – in energy as in almost any other field. But energy interdependence (at least among the three countries comprising North America) modifies the usual rules. Far from being a destabilizing element in their relative power (*vis a vis* one another) as it develops, it encourages acquiescence in a harmonious relationship of mutual advantage. Growth in the customarily accepted gauges of national power¹ on the part of any of the

¹ These have been enumerated in various ways by different authors. Doran, in his 1991 work, *Systems in Crisis: New imperatives of high politics at century's end* (Cambridge University Press), cited half a dozen distinct definitions of power itself (p. 45) and devoted all of Chapter 2 to "Measuring National Capability and Power". Any attempt to list the common indices of power today would have to recognize national population, education and training of the populace, natural resources, productivity, geographic situation, infrastructure for transport and communication, overall and per capita wealth, military capability, self-sufficiency in such economic factors as agriculture, strategic production, and energy, and reliable alliances.

partners tends generally to strengthen all three, so that the logical emphasis within the energy triad is on cooperation rather than competition.

Kenneth Waltz laid a cornerstone for neorealism when he wrote that “Differences of national strength and power and of national capability and competence are what the study and practice of international politics are almost entirely about.”² Yet he also declared that “States do not willingly place themselves in situations of increased dependence.”³ Perhaps it was his own concentration on nation-states within the entire global structure that led him to the second conclusion; or perhaps he was simply avoiding discussion of another reality in the modern world – namely, that subnational forces and even non-governmental actors today exercise great force on the direction taken by states. At any rate, the operation of the regime being considered here refutes any implication that interdependence occurs only with reluctance . . . or that it inevitably reflects the institutionalization of dominance and subjection.

Participating in the mutually dependent relationship for gas and electricity in North America gives each country-partner some extra strength (i.e., bargaining power) *vis a vis* each other. This added capacity goes beyond being just another checkpoint on lists of “the sources of power”. Its significance even exceeds what one might term “situational power”⁴ – a concept that will recur in Chapter 8. Once a multinational energy regime of this type has become established, the fact of regional energy interdependence

² Kenneth N. Waltz, *Theory of International Politics*, McGraw-Hill Publishing Company, New York, 1979, p. 143.

³ *Ibid.*, p. 107.

⁴ The term “situational power” during international negotiations is my own invention, which I have used in lectures for many years. For an example of “a highly successful bargaining by a small, physically ‘helpless’ country in dealing with a major industrialized power” grounded in quite different circumstances, see W. Howard Wiggins, “Up for Auction: Malta Bargains with Great Britain, 1971”, in *The 50% Solution* (I. William Zartman, ed.), Yale University Press, 1983, pp. 208-234.

also influences the separate initiation, formulation, and implementation of domestic and foreign policy by each of the three countries involved. It becomes an integral part of the intermestic *schema*, in which developments around the world also impinge on the energy regime that links these three.

The regime is not a supranational entity; yet it has a life (and power) of its own, apart from the central governments of the three countries. Power is sometimes defined as “the ability to influence others’ behavior”⁵; but the pressure exerted by the regime’s existence on individual national energy policies does not necessarily favor one or other of the partners. Rather, it prods one or another (or all three) toward fuller collaboration within the triad. Thus, the regime is not only self-sustaining; it tends to be self-strengthening.

This internal momentum toward closer cooperation does not diminish sovereignty, because it still operates by leave of self-interest. It continues only to the extent that a strengthened regime supports the broadly different goals perceived by the unique complex of policymakers within each country.

Energy is so important to any nation that a regime of this type could be demonstrated to have certain effects on non-energy policies -- such as national defense and fiscal affairs; but it would be too large a task to undertake here an explanation of how or whether that might take place. It is enough of a challenge to try to do so in respect to the narrower topic of energy policy.

The U.S. public is barely starting to grasp the idea that a “national energy policy” is more than a single document. Much of a nation’s effective energy policy is never

⁵ Robert O. Keohane, “Realism, Neorealism and the Study of World Politics,” in *Neorealism and Its Critics* (Robert O. Keohane, ed.), Columbia University Press, New York, 1986, p. 11.

written down and designated as such. Yet it is rhetorical fancy to complain that this country (or any country, for that matter) has no energy policy at all. At the extreme, a country that tried at every level to prevent its various arms of government from doing anything that affects the price, supply and application of energy resources would surely invite chaotic conditions; but that in itself would constitute a “policy”. Furthermore, there may be significant differences between the way parts of a national energy policy are enunciated and how they are carried out.

It is obvious that not every national policy decision is reached as a result of careful and well-informed deliberation; and various elements of national policy may well be inconsistent with one another. On most occasions no “perfect policy” is available – in which case the best objective may be a workable consensus. In a situation of complex interdependence, Haas suggests the prevalence of several simultaneous mixed-motive games, adding that “Costs and benefits result from complicated trade-off calculations made by each actor in deference to his own notions of interest.”⁶ (emphasis added) I believe that it is these ever-changing notions of interest within the three major polities of North America that have activated the gas-and-electricity regime. In turn, the regime ultimately influences and reflects the global situation. Thus, as changes take place, we are afforded the opportunity to analyze a dynamic example of interdependence. To do so, however, we need first to consider the goals and origins of any national energy policy.

Goals of National Energy Policy

Based on personal experience in drafting and/or editing several of the national energy policy documents that have been submitted to the U.S. Congress by successive

⁶ Haas, Ernst B., in Krasner, p. 59.

administrations (as well as analyzing others, both in this country and elsewhere), I have come up with a broad definition of what policy itself involves:

National energy policy is a framework of written and unwritten rules and attitudes, often built up over decades, involving all branches and levels of government (as well as the private sector), affecting all those aspects of economic, social and political life which – although they may not always be linked obviously and exclusively to energy – significantly modify (or try to modify) the ways in which energy resources are produced or consumed.⁷

This definition is equally applicable to Canada and Mexico. It encompasses so much, however, that it becomes difficult to structure any analysis of proposals to direct energy policy for the future (whether they come from the executive or legislative branches of government, from “think tanks”, or from a plethora of special-interest groups). A purely mechanical, enumerative approach might be to divide individual policy actions according to the three components of: a) supply, b) demand and c) delivery mechanisms. This is the way spokespersons for the current national administration in Washington tended initially to summarize in public the comprehensive policy proposal released in May 2001 from the group headed by Vice President Dick Cheney. Significantly, however, the printed report itself used two different titles: the simple one on its cover (*National Energy Policy: Report of the National Energy Policy Development Group*) and a longer one on its title page – “Reliable, Affordable, and Environmentally Sound Energy for America’s Future”. The latter seems more clearly goal-oriented.

The body of the Cheney document treats supply, demand, and delivery infrastructure, but it does not address these elements quite so starkly. The demand side of the energy equation is not treated *per se* until halfway through the text, in a chapter

⁷ This is the exact formulation I developed to use in lectures at SAIS during the fall semesters of 1997 and 1998, when I was co-teaching an introductory course on Energy and Environment.

whose subtitle evokes the popular terms “conservation and efficiency”. Traditional fuel supplies are then given one chapter of their own (the fifth of eight), and a separate one follows that is devoted to “renewable and alternative energy”. A subsequent chapter completes the triad mentioned above by addressing “a comprehensive delivery system”. But other parts of the report demonstrate that energy policy involves more:

After an opening chapter that sets out the general “energy challenge”, the first one in the report with real “policy meat” describes the problems of high prices. Next comes an appeal to “sustain . . . the nation’s health and environment”. And the concluding chapter talks of “national energy security”. So the underlying emphasis is actually on goals.

Thirty years ago there was usually not even a listing for “energy” (as we use the term now) in *The New York Times Index* or the *Reader’s Guide to Periodical Literature*. There might be an “Oil” or a “Coal” category there, or even one on “Power Generating Fuels”; but the idea of energy as a composite of sources (oil, coal, hydroelectricity, etc.) utilized to satisfy a variety of human requirements (space heating, illumination, processing, transportation, etc.) was an arcane abstraction rather than the stuff of daily headlines.⁸

During the “energy crises” of the 1970s (which coincided with a surge of interest in cleaning up our air and waters), it became commonplace to speak of “the balance between energy and environment”. It was then that I first came to realize that the real-

⁸ One marvelous exception was a book entitled *Energy in the American Economy, 1850-1975*, produced by a team of such pioneers in the field of energy economics as Sam Schurr and Hans Landsberg (with both of whom I was later privileged to work closely). It was published in 1960 by The Johns Hopkins University Press for Resources for the Future, but it soon went out of print and was reissued only in 1975 after the Arab Oil Embargo focused popular attention on the subject.

world balance in energy policy was much more complex. Rather than a two-way “scale of justice” arrangement (offsetting energy use against environmental concerns), it resembles a multi-armed mobile – with a series of general goals, periodically moving up or down in emphasis. They interact with one another constantly and inevitably, so that tugging on any single arm exclusively could upset the whole mobile and send it crashing.

I have used a variety of formulations since then to describe these goals; but they can be boiled down to about five⁹:

- 1) Adequate amounts of energy to ensure an acceptable measure of comfort, convenience, and opportunity for development;
- 2) Affordable prices (*ceteris paribus*, everybody tends to like relatively cheap energy – although the “right” level of prices might be interpreted differently by an oil producer anxious to keep up a steady flow of revenue and an oil consumer);
- 3) Reliability of energy supply, without intolerable apprehension about possible interruption;
- 4) A broad combination of environmental interests, including the health and safety of those in the energy work-force and the public as well as regard for a clean and attractive milieu; and
- 5) Satisfactory timing for any of the adjustments that are needed intermittently to rebalance the other goals as desired (e.g., a short-term lag in energy supply inspires less rancor than one that drags on, but it

⁹ It was only in preparing this dissertation that I noticed how each of these five goals was addressed in the *Project Independence Report* by the Gerald Ford administration, quoted in Chapter II (although they were not called out as such).

may take years for a new technology – relating to supply, demand, or delivery – to make much statistical difference in the national picture through penetration of a huge existing stock¹⁰).

The final goal (relating to time) is the hardest to elucidate, but it underlies all the rest. Theoretically, for example, it might be possible for the United States to achieve something approaching “energy independence” within a relatively short span of years; but this would be accomplished only via some combination of higher prices, restrictions on energy use, continuing uncertainty, and a dirtier, uglier, and less safe way of life for many citizens. Similar trade-offs exist among the other goals. This is an insoluble puzzle; the best an overall national energy policy can expect is a working consensus for the balance resulting from it (or envisioned by it) at a given moment.

As thus described in generic terms, this set of policy goals can be interpreted meaningfully for any country – large or small, in any period of history. They apply to each of the three NAFTA partners. The next question is: How does a domestic system make implicit decisions on a certain balance and translate the options available to it into energy policy actions?

Coincidentally, Haas answers this question . . . although he was writing about how international regimes (rather than domestic systems) work:

This question operationalizes concern with interests and structural principles. Goods, collective or private, are delivered by means of agreements that are negotiated (though the negotiation may merely cloak hegemonic imposition); hence bargaining becomes a matter of concern. The negotiators are usually bureaucrats representing organizations and engaged in creating new organizations; as regimes change they may be seen as

¹⁰ For instance, some tens of gigawatts of new generating capacity might be installed in North America in a busy year, but the thought of quickly and totally replacing nearly a thousand gigawatts of existing capacity is staggering – even if this were economically and technologically practical. The same applies to a vehicle fleet of well over 100 million, or a gas pipeline network that is more than a million miles in length.

enacting bureaucratic politics and organizational dynamics. In short we must focus on notions of process in dealing with the question of how regimes actually work, how collaboration is carried out.¹¹

Note especially Haas's choice of phrase in respect to regime change (the subject of the final chapter of this dissertation). He cites "bureaucratic politics" and "organizational dynamics".

Origins of National Energy Policy Decisions

Graham Allison's book *Essence of Decision*¹² dealt specifically with U.S. response to the Cuban missile crisis and in general with foreign policy; and he considered three paradigms for decisionmaking: 1) rational actors; 2) bureaucratic politics; and 3) organizational process.¹³ These can be applied just as easily to national energy policy. Ultimately, they become relevant to the North American gas-and-electricity regime – which is an extension of three countries' energy policies, as broadly defined.

¹¹ Haas, Ernst B., in Krasner, p. 29.

¹² Allison, Graham T., *Essence of Decision: Explaining the Cuban Missile Crisis*, Little Brown and Company, Boston, 1971.

¹³ During the defense of my prospectus, I was urged to consider alternatives to Allison's analysis of decisionmaking in large-issue policy. I have done so, but have found none that fits the energy situation nearly as well. For instance, an article by Wilfrid L. Kohl in the October 1975 issue of *World Politics* ("The Nixon-Kissinger Foreign Policy System and U.S.-European Relations: Patterns of Policy Making", pp. 1-43) proposed six different methods of reaching complex national policy decisions, including Allison's "bureaucratic politics model". This is the one that I believe best matches the process of formulating energy policy I have observed, especially when the model is expanded to include staffs, state or provincial officials, and various interest groups that interact with the government officials usually thought of as constituting the "bureaucracy". But none of Kohl's other five models fits the situation of energy policy implementation as well as Allison's "organizational process model". Roger Hilsman seems to merge organizational process with bureaucratic politics in the chapter on "Opening Up the Boxes" in his book, *The Politics of Policy Making in Defense and Foreign Affairs* (3rd ed., Prentice Hall, Englewood Cliffs, NJ, 1993, especially pp. 60-72), so his template fails once again to distinguish between articulating policy and actually carrying it out. James A. Nathan and James K. Oliver come close to an analogous examination of diffuse policymaking in their *Foreign Policy Making and the American Political System* (3rd ed., Johns Hopkins University Press, Baltimore, 1994). They evaluate inputs by various cabinet departments, Congress, public opinion, fragmentation. In my opinion, however, they also fail to match Allison's insightful simplicity in crystallizing the "essence of decision".

More or less dismissing the “rational actor” case, Allison observed that “the ‘maker’ of government policy is not one calculating decisionmaker but is rather a conglomerate of large organizations and political actors.” Even when the governmental machine appears to be a monolith, he points out the reality that “(1) monoliths are black boxes covering various gears and levers in a highly differentiated decisionmaking structure and (2) large acts result from innumerable and often conflicting smaller actions by individuals at various levels of bureaucratic organizations in the service of a variety of only partially compatible conceptions of national goals, organizational goals, and political objectives.” His “bureaucratic politics model” and “organizational process model” are alternate concepts of how this takes place. Each has appeal.

According to the bureaucratic politics model, policy is the “*resultant* of various bargaining games among players in the national government”. Allison goes on to focus on “the perceptions, power, and maneuvers of the players.”

“Because the spectrum of foreign problems faced by a government is so broad,” he adds (and he might just as well have been addressing energy policy – which is also broad and complex) “decisions have to be decentralized – giving each player considerable baronial discretion”. But (and this is a very important codicil) “different groups pulling in different directions produce a result, or better a resultant – a mixture of conflicting preferences and unequal power of various individuals – distinct from what any person or group intended”.

In his “organizational process model”, Allison thinks of choices as “outputs of large organizations functioning according to regular patterns of behavior”. Information is key, and since in my conceptualization the North American energy regime itself is a

continuing source of information, the interplay between it and domestic decisionmaking is obvious.

Allison also noted a certain amount of “independent output” from some organizations that are only “partially coordinated by government leaders”, who cannot “substantially control” their behavior. Within the North American gas-and-electricity regime, think of all the elements cited in Chapter IV – “governments within governments”, as well as NGOs, market forces, and even extra-continental influences.

It is the perceptions of interests by numerous actors within Canada, Mexico, and the United States, respectively, that determine actual energy policy (as distinguished from any single energy policy document, which is invariably incomplete because it cannot express the total context). To be more specific, Allison’s “bureaucratic politics” paradigm is most appropriate in describing the formulation of policy (such as it is), but his “organizational process” model comes closer to a true description of how complex policy is implemented. In both cases the existence of the three-country regime influences (and is influenced by) the way each country copes with the task of balancing the five goals just mentioned above.

Because of size disparities, Canada and Mexico both tend to find themselves as “price takers” on gas and electricity *vis a vis* the much larger U.S. market within NAFTA. In all three cases, however, social welfare considerations (and the need to placate voters in elective government structures) encourage the subsidization of retail rates. This is accomplished by different mechanisms in each country. In this country and Canada, state or provincial regulators independently adjust what the consumers in various regions must pay, while this is handled centrally in Mexico by the respective parastatal monopolies

(now, with the acquiescence of *CRE*), even though rate tariffs are not constant throughout the country. Trilateral interdependence of supply and demand affects the average base costs of both gas and electricity for the entire continent, so the existence of the regime sets fundamental limits to the prices each end-user is likely to see.

Since Canada will surely remain a net gas exporter and Canadian consumers have come to assume some protection for themselves through government intervention, one might expect commercial incentives to promote a national policy in favor of high gas prices – at least for the continental market. Most producers and officials recognize the shortsightedness of such an attitude, however. In 2003, low U.S. storage levels and somewhat exaggerated reports of gas production falloff throughout North America brought a fresh wave of high prices; and this in turn discouraged U.S. consumption of gas within the industrial and electric generation sectors (a process described in the academic and trade press as “demand destruction”). If such flyups were perceived to be a regular, periodic occurrence, this would be inimical to long-term Canadian gas-marketing interests; so it was probably no coincidence that Ralph Klein (premier of Alberta) made a special trip to New York and Washington in June 2003, offering assurances that future supplies from his province would be adequate to avert price-boosting shortages. In fact – for a different set of reasons in each instance – all three countries of North America are best served by stable energy prices. And these are most likely to accompany a stable continental energy regime.

According to Krasner’s wrapup of Haas’s views¹⁴, a regime may serve to increase the volume of transactions within a particular issue area -- which “can alter interests by

¹⁴ Krasner, pp. 362-3.

increasing the opportunity costs of change.” As applied to the North American regime, I have referred to this as the “ratcheting effect”. At the national level this might encourage maintenance of the regime, even though “At a disaggregated level the regime promotes the interests of some groups and damages the interests of others.” If one accepts the application of Allison’s decisionmaking models to energy policy, this only intensifies the pull-and-tug of policy formulation. If one examines the relative costs and benefits of association with the North American energy regime (see the table at the end of this chapter), the appeals of such membership (in achieving and maintaining a balanced approach to all five basic goals) are unmistakable.

The ramifications here are significant too. The “players” in the bureaucratic politics game over energy policy are drawn from a much wider circle than those government agencies directly connected in the public mind to energy. In the United States the innermost circle¹⁵ has ranged from a “troika” of the Office of Management and Budget, the Treasury Department, and the Council of Economic Advisors (under Reagan and the elder President Bush) to the National Economic Council (NEC) and its small but high-powered staff (under Clinton) . . . and, more recently, to what was represented as a cabinet-level group headed by Vice President Cheney. The NEC included the old troika plus the Secretaries of Labor and Commerce, as well as the U.S. Trade Representative. The Cheney group included (in the order cited in the report itself) the Secretaries of State, Treasury, Interior, Agriculture, Commerce, Transportation, and Energy, along with the

¹⁵ It is the statutory responsibility of the U.S. Department of Energy (more often finessed than observed during the past 20 years) to deliver a National Energy Policy Plan to Congress every two years. In fact, however, final decisions about the contents of such plans (when they were produced) have not been made within the Department – which has customarily been treated by successive administrations as a minor cabinet agency.

Director of the Federal Emergency Management Agency, the Administrator of the Environmental Protection Agency, the Assistant to the President and Deputy Chief of Staff for Policy, the Director of the Office of Management and Budget, the Assistant to the President for Economic Policy, and the Deputy Assistant to the President and Director of Intergovernmental Affairs for the White House. As explained in the next section of this chapter, the “organizational process model” brings into play other departments, FERC, state and local governments, corporations and trade associations – plus the court system. The Department of Justice is also charged with the prosecution of anti-trust cases (which have become a common factor in a period replete with cascading mergers and acquisitions among energy firms); and the relative vigor with which DOJ pursues investigations of corporate fraud involving energy kingpins such as Enron might also be viewed as an aspect of energy policy.

How the United States Does It

Vito Stagliano, a former official in the Policy Office of the U.S. Department of Energy, has gone farther than anyone else to date in writing about how national energy policy initiatives evolve. As an insider during the preparation of the National Energy Strategy (NES) issued during President George H.W. Bush’s administration, he has written an extraordinarily valuable, first-hand view¹⁶ of the machinations among departments and agencies within the executive branch of the federal government as the document developed; and he devoted a final chapter to the filtered translation of that

¹⁶ Vito Stagliano, *A Policy of Discontent: The Making of a National Energy Strategy*, PennWell Corporation, Tulsa, 2001.

Strategy into legislation – the Energy Policy Act of 1992.¹⁷ As a useful prelude, his first chapter offers “A Brief History of U.S. Energy Policy and Its Makers: From Roosevelt to Reagan.”

Stagliano’s 446-page work details how Treasury Secretary Brady initially tried to take direction of the NES preparation away from the Department of Energy entirely¹⁸ . . . and how the economic “Troika” (Treasury, Council of Economic Advisors, and Office of Management and Budget) continued as the major driving force. It also unveils the numerous public hearings that were held as primarily showmanship, although the Secretary of Energy in this instance (retired Admiral James Watkins) sincerely believed that they would somehow stake out a path for the nation. What they showed clearly instead was the sharp divergence of views and interests across the country, inspiring the Admiral to admit finally: “I say we have five nations – Northeast, Southeast, the Midwest, the Northwest and the Southwest.”¹⁹

According to Stagliano’s Prologue, Watkins was “directed by his President to find a balance among competing, perhaps irreconcilable goals of energy at reasonable cost, economic efficiency, energy abundance, environmental protection and energy security.”²⁰ Note the similarity to the five goals listed earlier in this chapter – omitting only the factor of time. As editor-in-chief for the NES document Stagliano’s book describes, I recall urging that timing also be recognized . . . by dividing the strategy into three sets of considerations and recommendations: short-term, mid-term, and long-term. My

¹⁷ Some important contributions of this legislation to the evolution of the gas-and-electricity regime were mentioned in Chapter V.

¹⁸ Stagliano, pp. 96-97.

¹⁹ Stagliano, p. 100.

²⁰ Stagliano, p. xiv.

suggestion was that the “short-term” horizon be limited to two years (the length of a term in the lower house of Congress and thus the interim between elections for the House of Representatives). I thought “long-term” was harder to pin down; but certainly it meant looking at least 10-12 years into the future (coincidentally putting that time-frame beyond the Constitutional eight-year limit of a Presidential term, but also moving into the practical realm of targeting for major new pipelines, meaningful percentages of change in our electric generation stock and infrastructure, reforms to energy regulation, or bringing entire new products²¹ and techniques into the marketplace through R&D, demonstration, and encouraging consumer acceptance. I assigned as “mid-term” those initiatives that might bring palpable results in a time-frame that was somewhere in between. My idea was rejected as too vague and complicating.

As an outside consultant to DOE, I was not a decisionmaker; but Stagliano’s account makes it clear that there were innumerable persons from throughout the federal structure who fancied themselves as such²² . . . and who actually did contribute to the content of NES in some ways. Ultimately, true to Allison’s bureaucratic politics model, “final decisions were as likely to depend on the personal standing of the cabinet advocates within the White House power structure as on analytical rigor.”²³ This became particularly obvious to me in January 1991, when I took advantage of a memo from Eric Melby of the National Security Council staff to introduce into the draft document I was editing the unmistakable relationship of the Gulf War to the need for vigorous policy actions in respect to domestic energy – a topic I had inexplicably been cautioned to avoid.

²¹ Hydrogen-fueled vehicles may prove to be one example.

²² According to Stagliano (p. 97), “Twenty-four federal departments, agencies and commissions sought and obtained representation on the [NES] Working Group.”

²³ Stagliano, p. 93.

This memo may have been the one Stagliano refers to on page 320 as a “summary strategy paper”; but he may not have realized that it facilitated an immediate change in the written draft of the NES document that would be circulated next for comment, since it was presented to me by another DOE official (Robert Marlay) without instruction or even advice. I felt safe in borrowing some phrases from it directly to insert in the NES, since it had “come from the White House” and made eminent good sense -- even though I realized that some of the words deviated from the earlier “line” of the EPC Working Group and had been excised when I had tried to use them earlier. Stagliano does mention that Melby and others at the NSC intervened to upstage the emissary of Treasury Secretary Brady to the Working Group on such matters as a drawdown of the Strategic Petroleum Reserve in connection with the Iraqi war (p. 88); and he states on page 320 that Melby (having been backed by both the State Department and Defense) insisted that the NSC would henceforth have the final word on language relating to energy security.

The complex overall picture Stagliano draws (aside from his numerous, highly subjective criticisms²⁴) is comprehensive and fascinating, but still not quite complete. For example, it does not allude to the role played on another part of the national stage by the Federal Reserve Bank in setting interest rates – a factor that may be as controlling as tax incentives in determining how much private capital will be directed into energy sources with high “up front costs” (ranging from nuclear power plants to large-scale photovoltaic systems). Nor can the book (with an understandably limited focus) communicate

²⁴ Overall, Stagliano’s book implies that careerists at DOE know best, and – if left free of political pressures – would produce an optimal energy policy. This may or may not be true; but his implicit suggestion is unrealistic. Energy policy in this country generally involves legislation that must be passed by Congress, investments that must come largely from the private sector, acquiescence and preferably cooperation by regulators (including many below the federal level), and – ultimately – energy consumers.

adequately how local interests (e.g., coal in West Virginia, corn as a feedstock for ethanol in Iowa, all manner of “soft energy” in “green” California) must somehow be accommodated in national policy proposals and policy legislation. Finally – and perhaps most important – the book’s brief epilogue could not describe in full detail how the Clinton administration that took control less than three months after the signing of NPAct by George Bush “implemented” the initiatives that had presumably been set in motion. It does note that, under Clinton, “Energy policy was by default assumed by EPA, whose rulemakings on the CAAA would prove more central to the energy industry than any provision in EPAct.” This was a prime example of how Allison’s operational process model works for energy policy . . . and a reminder that energy policy and environmental policy are inextricably connected.

Rhetorically, the only energy policy document touted as such during Clinton’s two terms²⁵ was not strikingly dissimilar from the ones I had drafted and that had been published during the Reagan-Bush era. Its Executive Summary mentioned strengthening the economy (adequacy of supply and protection from price shocks), reliability of sources, and the “reinvention” of environmental protection. Its emphasis on “sustainability” implied that the “balance” it sought would be developed on an achievable time path. However, because it seems that a U.S. Congress closely divided between the two major parties cannot agree on comprehensive energy legislation more often than about once every 10 to 15 years, “policy” depends not just on the law but on interpretations thereof . . . and on the way somewhat flexible rules are enforced.

Executive orders from Clinton (and, to some extent, under the second President Bush)

²⁵ *Sustainable Energy Strategy: Clean and Secure Energy for a Competitive Economy (National Energy Policy Plan)*, U.S. Government Printing Office, Washington, 1995.

replaced legislative initiatives in energy where this seemed more expeditious. Operating under such conditions meant that relatively less could be accomplished and reactions to circumstances often replaced solid innovations.

Federal legislative committees in the United States are far more powerful than in either Canada or Mexico, and the Congressional staffs that serve them are far more professionally expert. A single piece of legislation with energy policy implications may have to be discussed in hearings before multiple committees and subcommittees of each house; and committee chairs have broad opportunities to “bottle up” bills . . . or draw public attention to pet projects through the mass media.

Earlier parts of this dissertation mentioned the role of state public utility commissions, and they must never be forgotten. Because they set retail rates for various categories of U.S. gas and electricity consumers, they have the authority to mask the national wholesale market’s price signals. Yet energy that is relatively cheap to consumers can discourage conservation and efficiency measures, especially in the residential and small commercial sectors. At the same time, state or local restrictions on the construction of new energy facilities can block the modernization or rationalization of the infrastructure needed to deliver gas and electricity when and where it is needed – creating bottlenecks such as the one in movements of electricity between northern and southern California (Path 15), which has only recently been targeted for alleviation.²⁶

With so many actors involved, it is perhaps inevitable that personalities and perceptions play a large role too. This applies to lawmakers, regulators, enforcement officials, and even consumers. In turn, that opens the door to influence by special

²⁶ Dave Christy, “Path 15 Takes Shape”, *Closed Circuit* (a publication of the Western Area Power Administration), December 5, 2003.

interests – energy companies, equipment manufacturers, environmental protection groups, and others – as well as to reporting by the mass media, which too often perpetuate clichés instead of checking up-to-date facts. One current example is the myth that U.S. demand for natural gas has been rising steadily. Although this idea has been accepted almost universally (not just by the citizenry at large and its elected representatives, but even by such a careful public servant as Fed Chairman Alan Greenspan in his mid-2003 testimony to Congress²⁷), statistics simply do not support it. Total U.S. consumption of natural gas use has been essentially flat since 1996.²⁸ Domestic production has followed a similar path since 1994²⁹ (although the amounts put into and withdrawn from storage fluctuate); and imports from Canada (which were deprecated somewhat during the same series of hearings in 2003) remain steady³⁰ – although maintaining that pace beyond about 2009 will require completion of the pipeline from fields in that country’s far north.³¹

Competition among various types of energy in the marketplace leads proponents of the respective sources to vie for formal policy preference as well. Boosters of coal emphasize the abundance and relatively low cost of the fuel itself, while champions of natural gas point to that fuel’s clean-burning qualities (in contrast to coal, unless heavy

²⁷ Testimony of Chairman Alan Greenspan on natural gas supply and demand issues before the Committee on Energy and Commerce, U.S. House of Representatives, June 10, 2003. Although Greenspan spoke of how, in heat equivalent, “natural gas consumption by 1970 had risen to three-fourths that of oil” and went on to say that “natural gas has gradually increased its share of total energy use” since 1985, Table 1.3 of EIA’s *Monthly Energy Review* for May 2003 shows a different story. The gas-to-oil consumption ratio had dropped to about two-thirds by 1973, fell below 60 percent in 2001, and recovered to only 62.4 percent in 2002. The share of gas in total U.S. energy consumption rose by an average of less than one percent annually between 1985 and 2002 – a “gradual” increase indeed, over 17 years!

²⁸ EIA, *Monthly Energy Review*, Table 1.3.

²⁹ *Ibid.*, Table 1.2.

³⁰ *Ibid.*, Table 4.3.

³¹ Ron Turner (Chairman, Canadian Energy Pipeline Association), graph showing “Gas supply outlook” in his presentation at an all-day conference at the Canadian Embassy in Washington, DC, on “Energy in the North American Market: Innovation, Investment and a More Secure Future”, June 12, 2003.

capital outlays for generating plants using the latter are increased even more by incorporating special, expensive technology). Nuclear power plants are touted for the fact that they require no imported fuel either, and emit no pollutants during normal operation . . . while those who back “renewable energy” instead warn of possible accidental discharges from “nukes”. The examples of such self-serving promotion are legion; and, in fact, many of the claims are true (or at least partly true). As such, they become grist for the policy mill.

A commercial provider of electricity, faced with a choice among new units that might be installed, may consciously try to balance the five energy goals cited earlier in this chapter – even including time, in terms of how long it takes to get the necessary regulatory approvals and get the plant ready to operate on site. But it would be a novelty to see a Congressional hearing (or even a floor debate on Capitol Hill) that tried to consider all of these elements simultaneously. The more normal course of policy evolution, unfortunately, is to debate proposals related to one energy source at a time – with its proponents publicizing its appealing attributes and avoiding negatives wherever possible. Nevertheless, thanks to the wondrous workings of representative government, the resultant (as in Allison’s bureaucratic politics model) is something like a popular consensus. This is not an edifying picture . . . but there is an old saying that the legislative process (like sausage-making) should be spared scrutiny.

Partisanship and ideology almost invariably influence deliberations – sometimes fuzzing regional interests in specific cases because of the extra lenses through which they are viewed. Recent discussions of the need to speed up drilling for natural gas in the U.S. Rockies have been pressed in Congress by Wyoming representatives, but that State’s new

Democratic governor in Wyoming has taken an opposing stand -- directly contrary to the one his Republican predecessor had held.³² Straight party-line votes in committees and on the floor are not at all uncommon in connection with the “comprehensive” energy legislation that was still bogged down in the U.S. Senate in early 2004.

Finally, the U.S. courts play a profound role in national energy policy. The Supreme Court’s 1954 decision in *Phillips v. Wisconsin* affirmed federal regulatory authority over most natural gas, although it took many years of wrangling within the Federal Power Commission (forerunner to FERC) and in other litigation to clarify details. During the 1970s, the *Calvert Cliffs* decision by the Supreme Court determined that nuclear power plants had to satisfy environmental as well as safety and financial requirements in order to be licensed for operation. Cases still pending in the hierarchy of courts will decide the fate of massive energy supply contracts signed by California in the much more recent past – not to mention the financial future of that state itself and of a number of energy-associated corporations.

Power and Process Differences among the Three Partners

The domestic cast of characters in energy policy development follows the same outline in all three countries of North America – central government, constituent governments, a host of NGOs with diverse special interests, and a fairly vague coterie of “opinion molders” in the communications industry and think tanks (supposedly objective observers, but quite commonly narrow advocates of specific policy elements).

³² Natalie M. Henry, “New Western Democratic governors throw weight toward anti-drilling efforts,” *Land Letter: The Natural Resources Weekly Report*, March 20, 2003.

President Clinton announced in one of his State of the Union addresses that the era of big government was over for this country. Although that was greeted with understandable skepticism, decentralization of authority and responsibility has been a pattern in recent times throughout North America in respect to energy. Chapter IV dealt with some of the effects of each country's distinctive brand of federalism on its interaction with the gas-and-electricity regime. At the risk of some duplication, this section will note briefly how related traditions and changing circumstances both impinge on the substance of energy policy and national interest.

For Mexico, the analysis in Chapter VI of 1977-78 natural gas negotiations with the United States illustrated jostling inside the presidential cabinet that corresponded to Allison's "bureaucratic politics model" for reaching policy decisions on energy. Even now, the Finance Secretariat (*Hacienda*) arguably exercises more influence than the Secretary of Energy, because the former controls the disbursement of revenues – including the huge percentage of each annual budget that goes directly into the Treasury from what would be considered Pemex operating profits if that institution were allowed to act like a conventional corporate enterprise. Because of the sensitivity of relations with the United States, the Foreign Ministry would also normally have considerable input.

Still, the President and his advisors generally maintain the external appearance of unanimity³³; and Mexico as a nation has the most highly centralized system of governmental, social and economic authority among the three countries. Canada has the loosest federal system, especially in respect to energy matters – since the provinces

³³ In theory, *CRE* operates independently, so there may be some room for Allison's organizational process model to take hold here – as well as in Pemex, *CFE*, and *Luz y Fuerza*.

control the bulk of the country's natural resources.³⁴ The United States is in the middle: The federal executive branch is responsible for government lands (onshore and offshore) that contain much of the nation's energy resource, besides massive assemblies of electricity generating facilities in its Tennessee Valley Authority and Power Marketing Authorities. Yet it is bound by Congressional statutes and judicial interpretations.

Impasses between the national executive and the federal legislature in Mexico – and even partisan differences between the federal government and the state governors in that country – are relatively new developments. Yet, for more than half his six-year term, President Fox has been thwarted in his efforts to reform the gas and electricity sectors by a Congress in which no party holds clear control. Technically, Mexican governors have nothing to do with energy policy; but – as noted in Chapter IV -- the Energy Secretariat was sufficiently respectful of their growing power in general to meet with them and discuss what the national administration's energy policies could mean to their respective regions. And Mexico's Supreme Court has asserted a new independence³⁵ – which could reach back to the reforms of Salinas and Zedillo through constitutional rulings that bring the position of independent power producers into question. In April 2002 the Court indicated that IPPs and self-generators were not free to sell excess power they might produce to the national grid, since this would amount to providing electricity “for public

³⁴ Robert N. McRae offers a very concise, yet informative and analytic description of the federal-provincial tug-of-war over energy as it evolved in Canada through several decades in his contribution to *NAFTA in Transition* (“the Emergence of North American Energy Trade without Barriers”, pp. 79-92). A footnote on p. 83 adds an observation that could be quite important in the future – namely, that “the federal government owns the mineral rights for the offshore region and in the Yukon and Northwest Territories”. See also Michael Duquette's subsection in the same work on “The Provincial Commitment to Energy Development” (pp. 296-298), within his chapter on “Factors Affecting Energy Trade”.

³⁵ Kevin Sullivan and Mary Jordan, “Mexican Supreme Court Refuses to Take Back Seat: No Longer Under the President's Thumb, Justices Intend to Serve as a Check on Government”, *The Washington Post*, September 10, 2000, p. A-31.

service” (a constitutionally guaranteed government monopoly). There has been no real clarification of what this finding implies; and no test cases have been brought to date – perhaps because there is little desire to risk unraveling a workably reformed system that was put in place by a PRI President no longer in office.

Canada has a parliamentary system, which obviates the splits between executive and legislative branches that complicate energy policy for its two partners. Still, this is more than made up for by tensions in attitude between Ottawa and the provinces. When Prime Minister Chrétien decided to push ahead with ratification of the Kyoto Protocol, he called for a vote of the Parliament³⁶; but this was technically not even required. A decision by his Cabinet alone would have been sufficient. Furthermore, the status of the Protocol as an international treaty is considered broadly to authorize enforcement measures by the federal government for compliance that might ordinarily be reserved to the provinces for energy matters. It remains to be seen whether Chrétien or his successor will succeed in this major energy policy direction. Allison’s “organizational process model” reminds us of the large number of recalcitrant actors at the provincial level whose cooperation will be needed for effective policy implementation.

In respect to judicial interventions, Canada has built regional diversity into its Supreme Court. Three of the nine justices must always be from Québec; and tradition dictates that three come from Ontario, two from the West and one from the Maritimes. But “native Americans” hold a special, separate position of influence in Canada that cuts across regions and is unparalleled in the United States . . . or certainly in Mexico as

³⁶ Nominally, Canada has a bicameral federal legislature; but the honorific Senate is a weak body – members of which, once appointed by the Prime Minister, are free to serve until they reach the age of 75. Another indication of the Prime Minister’s considerable authority is that (unlike the situation in the United States) he is not required to seek “advice and consent” in cabinet appointments.

things now stand. For example, acceptance by Canada's "First Nations" is absolutely necessary for additional major developments in hydroelectricity – on which the country relies to an extraordinary extent. In their past resistance to new dam systems that would affect their traditional lands and way of life, some of Canada's "nations" have received support from environmentalist and human rights NGOs in the United States, but thus far patient government negotiation has usually wound up winning the support of native leaders – often as a result of large financial settlements and various guarantees of acceptable ground rules.

It should be clear that many operatives within the energy regime inside each country represent interests that are distinct from any sort of national composite. Texas and California (two huge, powerful, and fiercely independent states) happen to border on Mexico, while New York, Illinois, and Michigan (three more electoral giants with great power in Congress) are understandably more alert to U.S.-Canadian energy relations. In Canada, the provinces of Alberta, British Columbia, and Quebec are major energy exporters; but populous (and energy-strapped) Ontario is well aware of the need for adequate and reliable supplies. Finally, Mexico's states of Baja California and Nuevo Leon might have reason to see a brighter future in close energy relations with the Colossus to the North than with their own country's Federal District.

Nongovernmental organizations are generally strongest in this country and weakest in Mexico – except for the Mexican labor unions. Dominated by the PRI, the latter may not even have qualified in the past as "legitimate" NGOs; but a strong PRD presidential candidacy in 2006 could make them vociferous independent spokesmen in energy matters – primarily in opposition to any action seen as eliminating established

sinecures in the industry. The oil and gas workers union is distinct from that of *CFE*; and that, in turn, is separate from the union of workers in *Luz y Fuerza* (perhaps the one most resistant to change).

Each of the agents mentioned thus far has a vested interest in the energy regime, whether acknowledged or not. And we ought to keep in mind that what Puchala and Hopkins said about an international food regime is likely to hold also for one in energy: “Functionally specific regimes . . . are directed by technical specialists and middle-echelon administrators in participating governments.”³⁷ Cooperation among like-minded people comes easier than it does with those who represent power-conscious occupants of an anarchic world-system in the game of “high politics”. This might well be an argument for supporting the timid but potentially effective efforts of the North American Energy Working Group – especially if NAEWG could be expanded to admit regional diversity and somehow encompass the associated interests of environment, labor, industry-business, and small energy consumers.

Downsides and Dangers

Table 5 is a bare skeleton of innumerable pluses and minuses involved in this cooperative regime. It appears to me that total advantages here clearly outweigh negative aspects, although this conclusion is open to challenge. By definition, energy interdependence does induce mutual dependence. As shown by the debate on NAFTA (which has continued to some extent, years after entering into force), even a small number of injured parties can make themselves be heard on the national stages of any democratic country.

³⁷ Krasner, p. 88.

The dynamic balance must somehow satisfy a consensus among a widely diverse cast of players who would have trouble even agreeing on what the respective goals entail if they had to enunciate them. In fact, they are not required to do so. It is quite a normal process for continual adjustments to take place – generally unnoticed -- among goals that may conflict.

A major difficulty is posed by the fact that energy “deregulation” is still a work in progress in all three countries. As with NAFTA, its proponents originally exaggerated its potential benefits (especially in the short term) and refused to acknowledge the possible pains of adjustment. Flyups in the prices of both natural gas and electricity have prompted officials in Washington, New York, and California to castigate the whole system, which is still evolving and may take as long as another decade to mature. The U.S. Secretary of Energy himself has used crass hyperbole for political effect in comparing the U.S. electricity network (whose limitations have been alluded to above) with that of a third-world country. The danger is that overreaction and tinkering with a market on its way to being more fruitfully competitive could seriously damage one of the four factors that are necessary for energy interdependence to succeed (see Chapter V).

Another hazard that should not be disregarded is that decisions about energy policy are often taken on the basis of official or public whims that have nothing to do with energy – which is still, after all, “below the radar” on the screens of many observers. Vote-trading on unrelated issues is commonplace in legislative bodies. A failure by President Fox to satisfy an eagerly expectant electorate in any way (or to manage intragovernmental relations, under conditions the nation has never seen before) could interrupt effective cooperation with North American partners in this and other fields.

Tension between President Bush and Prime Minister Chrétien over international peacekeeping or softwood lumber might have delayed discussions of mutually beneficial pipeline routes.

A large economic shock in any of the three countries, regardless of origin, will be transmitted somewhat more rapidly and deeply because of these energy links. Speaking of international regimes in general, Krasner puts that sort of threat in the baldest and most frightening terms: “Economic interdependence vitiates the formal powers of the state. Prosperity is hostage to external and uncontrollable variables. Governments can no longer guarantee the safety or the economic well-being of their populations.”³⁸

Personally, I think Krasner’s word here constitute an overstatement – at least in the case of the North American energy regime. That regime is designed (or, to use more careful phrasing, has evolved) so as to permit continual self-adjustment. The way this takes place is the subject of the next (and final) chapter.

³⁸ Krasner, p. 366.

**Table 5. REGIME EFFECTS ON NATIONAL POLICY GOALS:
SAMPLES OF ADVANTAGES (+) and DISADVANTAGES (-)**

(Note that continued adherence to the regime offers opportunities to moderate negatives.)

	<u>CANADA</u>	<u>MEXICO</u>	<u>UNITED STATES</u>
Adequacy Of Supply	Alternate electricity sources, especially for emergencies (+) Drought danger worsened by export commitment (-)	Burgos Basin develops sooner (+) Electricity for northern cities more easily available (+) High California demand adjacent to growing demand in Baja (-)	Gas for New England (+) Seasonal availability of electricity (+) 2001 West Coast problems due in part to Canadian droughts (-)
Affordability	Broader market spurs early development of Maritime gas (+) “Deregulation” came at time of price flyups (-)	Marginal-cost pricing available for gas from broad area (+) Unaccustomed exposure to free-market pricing brought shocks (-)	Pipeline gas usually cheaper than LNG (+) Economic dispatch of electricity reduces costs (+) Heavy capital outlays still needed for infrastructure (-)
Reliability Of Supply	U.S. can backup domestic power in emergency (+) Ready market for gas speeds “opening” of northern fields (+) Seasonal demand swings could be exaggerated (-) 2003 blackout raised some apprehensions (-)	Increased opportunities to improve power grid (+) Outside sources help satisfy rising natural gas demand (+) Specter of U.S. unilateralism invites nationalist rhetoric (-)	Less dependent on suppliers subject to interruption (+) Great care required as NERC expands supervision (-)
Acceptability For the Environment	Fewer power plants needed for any given output (+) Order of dispatch subject to control (+) Strong encouragement to increase “big” hydro (+ and -)	Natural gas, new technology more readily available (+) Some threat of becoming a “pollution haven” (-)	Generators’ major shift to gas requires imports (+) Mexican air-quality enforcement raises some questions (-)
Timing of Adjustments As Desired	Maritimes’ energy/economic development speeded (+) Alaskan pipeline could delay MacKenzie gas (-)	Less total investment required; more capital available (+) Energy improvements in north do less for Central area and South (-)	Pressure to reduce reliance on Mideast eased sooner (+) Partial solutions might delay development of both ANWR and renewables (-)

VIII. HOW CHANGE TAKES PLACE IN THIS REGIME

Forces of Evolution

The time has come to fit all the pieces together.

Chapter IV noted that – by definition -- an “international regime” derives its integrity from common acceptance of principles, norms, rules, and decision-making procedures in a specific issue area. Actors within a regime count on this, so the regime’s existence facilitates their interactions. The North American gas and electricity regime does not have a headquarters, a staff, or a single, comprehensive instrument of legal concurrence (such as a treaty or a constitution). Yet the regime is a “virtual reality”. It is readily perceived, and it exercises palpable influences -- both on its constituents and on other systems in which they participate. In turn, the working rules of this regime respond to the individually self-assessed interests and the relative power of the key members; and this is how change most often is brought about.

The three NAFTA partners are the leading actors within this regime; but -- as Chapter IV went on to explain – the total regime is more complex. It involves subnational and non-governmental actors, as well as a number of multinational entities (such as the Commission for Environmental Cooperation and the North American Energy Working Group). That is why I call this regime a “metanational” association. It is structured around “intermestic” issues, which may distinguish it in important ways from many regimes considered in the literature of international relations.

Oran Young hinted at this possibility when he observed that “In formal terms, the members of international regimes are always sovereign states, though the parties carrying

out the actions governed by international regimes are often private entities . . .”¹

(emphasis added). I have adapted Graham Allison’s explanation of decisionmaking, however, to illustrate that the act of carrying out policy (e.g., by national or sub-national regulatory bodies . . . and even by a trilateral NGO such as the North American Electric Reliability Council) is tantamount to making policy.

As suggested in Chapter VII, a major sustaining and centripetal force for this particular regime comes from its ability to help satisfy generic energy policy goals that are common to Canada, Mexico, and the United States (adequacy of supply, affordability, reliability, etc.) – even though these goals mean different things to each country, and to various actors within each country. Furthermore, it is obvious that some relevant circumstances are continually changing. Throughout the ongoing evolution of the regime, Allison’s schema of decisionmaking – which Chapter VII applied to energy policy -- recognizes that relative “power” among actors (by some definition) still plays a role . . . in sustaining operation and in effecting change.

How does such an unwieldy creation as this regime adapt? Does it hold within itself the catalyst of its own instability and demise? Even the most rudimentary response to these legitimate questions requires us to look back at Krasner’s analysis of various types of change that may be associated with regimes.

As I interpret Krasner’s summation², an international regime itself persists so long as its principles and norms remain operative. If these are modified substantially, the

¹ Oran R. Young, “Regime Dynamics: the rise and fall of international regimes,” in Krasner, p. 93.

² Krasner’s phrasing (p. 5) is slightly more compressed, but – in my opinion – less easy to follow. His exact words were: “In sum, change within a regime involves alterations of rules and decision-making procedures, but not of norms or principles; change of a regime involves alteration of norms and principles; and

regime either dissolves or becomes a different entity (perhaps a new regime). Short of collapsing, a regime is weakened if its components begin to lose coherence – a situation that may result either from the demurral of actors to behave in concert with set principles and norms or from the regime’s becoming inconsistent with actors’ interests. By contrast, it might be commonplace for certain regimes (including this one) to alter their rules and decisionmaking procedures from time to time. That, in fact, reflects vitality.

The principles I attribute to the North American gas and electricity regime are fairly loose (again, see Chapter IV). They amount to a general commitment to accept and foster energy interdependence so long as national sovereign interests (as each nation interprets them) are not dismissed. The norms are also rather unexceptional: Respect for legal property rights and contracts, an avowed preference for transparency in regulation, and a commitment to enforce or improve the respective standards of environmental protection. Acknowledged failure to live up to these would doom the regime as it has come to operate. The wide latitude permitted within this rubric, however, is a key to this regime’s likely longevity.

As for rules and decisionmaking procedures, change may take place in this regime as a result of action by almost any component or combination of components. Their actions may also be triggered in response to events outside the regime (e.g., economic insecurity or changes in the world oil and natural gas markets). In turn, the operation of this regime will be sensed by the rest of the world – since the three countries account for such a large share of global energy production and consumption.

According to Krasner, “The prevailing explanation for the existence of international regimes is egoistic self-interest . . . The egoist is concerned with the behavior of others only insofar

weakening of a regime involves incoherence among the components of the regime or inconsistency between the regime and related behavior.”

as that behavior can affect the egoist's utility."³ My contention is that energy policy in each of the three countries is shaped by domestically consensual perceptions of a proper balance among the five key goals treated in Chapter VII, but that these perceptions (and the feasible means of achieving a desired balance) vary as time passes:

- Each country's perceptions of the goals, their relative importance, and the ways to move in the direction of an optimally balanced policy result are all influenced by the very fact that a North American gas-and-electricity regime now exists. The regime has become a context that cannot logically be ignored.
- The regime itself is responsive simultaneously to the global political economy – which is capable of modifying the dimensions and feasibility of all these goals.
- Interactions are continuous; and the regime – which reacts to stimuli both from “above” and “below” -- is flexible enough to accommodate changes that may be necessary to preserve itself and its useful mission.

Although a generally free market in energy is crucial to the effective regime in North America, each country's policy determinants continue to exercise “free will”. This permits deviations from an absolutely free market to satisfy other goals (e.g., regulation of retail prices to ensure affordability, preferential treatment of certain energy sources to enhance protection of the environment). The process is colored by personality and the three distinctive federal systems, as well as by the relative political and persuasive powers of various domestic players – not to mention the disparate juggling of some non-

³ Krasner, p. 11.

economic goals. This view stands solidly on Ernst Haas's "middle ground" between "liberalism and mercantilism" in respect to the role of markets in contemporary regimes such as this one:

Thus, the structure of the mainstreamers' system contains some law-like constraining qualities (e.g., the role of market shares or the monopoly power of single firms), but it also sees structure as routinized bargaining behavior informed by relatively slowly changing perceptions of self-interest.⁴

This stance also accords with the observation by Hopkins and Puchala that "New knowledge . . . can provide the basis for . . . evolutionary change, which usually involves altering rules and procedures within the context of a given set of principles and norms".⁵

Note the consistency here with both of Allison's major models of decisionmaking (bureaucratic politics and organizational process). Change is decided upon and implemented within this regime in accordance with these two paradigms. This explains the mechanism which underlies what I consider the most powerful series of sentences in Krasner's concluding chapter:

Regimes may assume a life of their own, a life independent of the basic causal factors that led to their creation in the first place. There is not always congruity between underlying power capabilities, regimes, and related behavior and outcomes. Principles, norms, rules, and procedures may not conform with the preferences of the most powerful states. Ultimately, state power and interests condition both regime structures and related behavior, but there may be a wide area of leeway.⁶

There are "lags and feedback" that contribute to the autonomy of the North American energy regime. The fact that the regime as a whole is most likely to persist (even while evolving) might itself be considered a "lag". Yet at the same time its

⁴ Haas, Ernst B., in Krasner, p. 52.

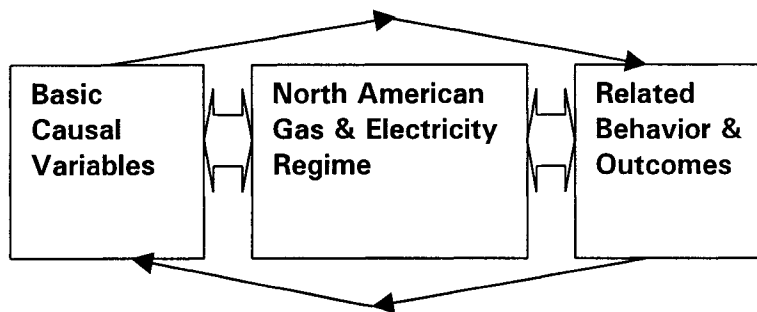
⁵ This is compressed from Krasner's opening chapter summary on p. 20.

⁶ Krasner, p. 357.

existence speeds up interactivity among the nation participants in this issue area – a concrete example of useful and productive “feedback”.

Taking all this into account, I have combined two diagrams from Krasner’s final chapter (p. 359 and p. 361) as a starting point and then built upon them in order to indicate a “schematic of causality” for the North American gas and electricity regime. I believe it helps to explain not only how but why changes take place in this specific case.

Fig. 2 -- How Change Occurs: A Dynamic Example of Interdependence



This new diagram is consistent with the part of Krasner’s discussion (pp. 357-365) that relates to the persistence of regimes, rather than their creation. In particular:

Once regimes are established they may feed back on the basic causal variables that gave rise to them in the first place. They may alter the distribution of power. They may change assessments of interest. Regimes may become interactive, not simply intervening, variables.⁷

The “basic causal variables” in the North American case at hand are the factors described in Chapter V as having been necessary and sufficient for the three countries to become energy interdependent. The conflation of these factors during the 1990s is what brought about the creation of this regime – which now essentially sets and maintains the

⁷ Krasner, p. 358.

rules under which energy interdependence flourishes. Once an autonomous regime of this type has proved viable as a framework for future actions, Krasner illustrates a back-and-forth relationship between it and its basic causalities. I go beyond that, however, to diagram a similar two-way relationship between the regime and “related outcomes” – regardless of whether the latter resulted: 1) from the existence of the regime, 2) directly from the basic causal factors, or 3) from totally exogenous forces. Note, of course, that I do not maintain that all international regimes fit such a model of heightened interactivity – only that this one does. Without attempting any rigorous investigation (much less proof), I suggest that my model could be common to “metanational” regimes constructed around “intermestic” issues. Certainly the complexity of the decisionmaking involved in such regimes would argue for a larger range of feedback possibilities.

During the 1990s, this regime portrayed the relative power of Canada, Mexico, and the United States (including “situational power”) as they chose to exercise it then; and each nation (as a whole) was sufficiently content with that relationship to acquiesce in the regime that reflected it. They still are.

Why? It is because the decisions that established and now modify the regime’s rules from time to time are reached by national and subnational actors within the regime. These judgments are based on their respective perceptions of the five energy policy objectives enunciated in Chapter VII . . . and a balance among them deemed acceptable to the constituents of each country, depending on their relative power within that nation). In this way, energy interdependence in gas and electricity promotes the disparate objectives of three distinct national energy policies. The regime is desirable because it sustains and gradually deepens energy interdependence.

The “related behavior and outcomes” fostered by the regime are of two primary types. Some are confined to arenas within the regime. Others may involve broader international relations – hemispheric, intercontinental, or even global. They may be energy-specific (such as the condition of the global oil market); they may be more general (such as the economic welfare of the populaces); or they may even involve “grand diplomacy” (such as attitudes toward war and peace in the Middle East).

I have added several pathways of interactivity to those shown by Krasner in the interest of making my representation more comprehensive. First, I had noted long ago that the “behavior and outcomes” resulting from either the direct effect of the basic variables on outcomes (which appears in his first diagram, although not in the second, but which I include) or their indirect effect through the regime as an intervening variable could continue to resonate throughout larger and smaller systems. I also added an arrow to illustrate that resultant “behavior and outcomes” (even including some outside North America) might serve to help change the rules of the regime itself.⁸ Finally, I added yet another arrow to show that outcomes and transformed behavior could also bounce back to modify the basic causal variables (perhaps even including the institution of NAFTA itself, which faces the options of “deepening” and/or “widening”).

The North American gas-and-electricity regime is not static; nor can it be. During its brief life it has felt strong centripetal and centrifugal forces acting upon it -- tending to make it stronger or weaker, respectively. Some such forces arise from within one or more of the partner nations, while others come from outside the continent. A few examples – first, fairly general and then more specific -- should suffice to bring this home.

⁸ For example, natural gas and power producers in Canada may sell their products directly to U.S. wholesale customers; and Mexican industry is no longer restrained from importing energy directly.

General Pathways of Influence

1. Chapters IV and V gave ample explanation of how the conjunction of four basic causal variables encouraged energy interdependence and thus produced the regime. But how does (or might) the existing regime “feed back” into each of these four factors?

The *sine qua non* among the four causal variables was the institutionalization of relatively unrestricted trilateral trade in gas and electricity via NAFTA (which was erected upon the platform of the earlier bilateral Free Trade Agreement between Canada and the United States. I submit that if NAFTA is ever renegotiated Mexico will be under great pressure to relax its self-exemption from any commitments on energy matters beyond eliminating tariffs. The reliance several of its northern states have developed on gas imports (primarily for the generation of electricity, but potentially for certain industrial uses too) will become increasingly difficult to forego. In the same fashion, however, Canada will be in a stronger negotiating position on energy matters *vis a vis* the United States because its exports of natural gas to this country more than doubled during the decade of the 1990s. And, at the same time, electricity trade in North America has developed around the rules of NERC (in which the U.S.-based actions of FERC and state public utility commissions have preponderant influence). That places the United States in a more influential position (i.e., increases its relative power) in some respects.

The second necessary factor was a movement in all three countries toward acceptance of market forces as the underlying determinants of wholesale price, supply, and demand. These, in turn, govern the actions of both public and private distributors of gas and electricity. As we have seen, the energy muddle in California and the spectacle of

widespread corporate dishonesty in connection with energy trading shook confidence in the principle of monitored competition that underlies this factor. Still, the extension of the market to continental proportions actually eased the pain of readjustment. Were it not for the “safety valves” of Canada and Mexico (as both suppliers and consumers of U.S. energy), the reaction of public and legislators in this country against regulatory restructuring would probably have been even more severe. Similarly, the actual and potential future benefits of regime partnership to Mexico and Canada tend to keep their faith in market pricing alive. Thus, the existence of the regime has helped (thus far, at least) to ensure the survival of one of its own wellsprings.

It would be hard to imagine coast-to-coast trading (much less a continental market for gas and electricity that crosses international borders in north-south directions) without the advent of electronic systems that can link buyers and sellers instantly -- regardless of geographical separation. That made such systems the third necessary factor for energy interdependence. In this instance, experience within the regime has exposed some flaws in the way electronic trades were originally handled and monitored. As a result, there are now better prospects for both “software” and “hardware” in the future. Improved reporting systems are being developed to rebuild trust in the availability of accurate information. The Electric Power Research Institute is at work in conjunction with both government and individual corporate research teams to develop self-healing “smart grids” that should help overcome congestion problems and improve the efficiency of energy exchanges through automated systems.

As a result of all these contributing factors, energy interdependence across North America’s borders might exist to a considerable extent; but it would be far less intimate if

natural gas and electricity had not also become more or less fungible with one another within the broad continental market. This convergence of two products within the energy industry was the fourth factor in the creation of the regime we have been discussing. If we trace the development of the gas and electricity connection, however, we discover that their synergism now depends to an increasing extent on that regime.

Since the oil-price shocks of the 1970s, there has been a broad and sharp downturn in energy intensity throughout North America (meaning that the consumption of energy resources overall has increased less rapidly in percentage terms than Gross Domestic Product). Conservation and energy efficiency have not been the sole explanations; part of the reason has been a shift in economic structure – away from energy-intensive heavy production and toward services. Use of electricity has tended to resist the trend, however, for several reasons: Computers and the “digital economy” are characteristic of the contemporary service sector, but they are increasingly significant consumers of electric power. At the same time, affluence has increased the use of electricity for air conditioning and various conveniences. In recent years, more and more electricity has been generated through systems fueled by natural gas. Thus, despite offsets through increased efficiency in its other applications, the consumption natural gas throughout North America will probably rise in the future.

Some ramifications of this have been described earlier in this dissertation. Were it not for opportunities guaranteed by the regime, Mexico would not have been able to shift successfully from oil to gas in its own blossoming electricity sector. Without the opening of markets through trans-border trade, eastern Canada (and New England) would still be without the gas resources that are being brought to market from the Atlantic offshore. By

extension, the current interest in reopening, expanding, and augmenting facilities on both coasts to receive and regasify LNG from overseas would not have come alive this soon.

Continued success for the gas-electricity relationship also depends generally on the regime's ability in the medium and long term to smooth out seasonal peaks and valleys for demand of both -- promoting economic efficiency and dampening price volatility. Continued smooth operation requires access to multiple sources (including marginal inputs of LNG) to ensure reliability and beneficial competition. Such prospects are feedback from the regime; but without them the convergence of the gas and electricity sectors (one of the causal factors in the creation of that same regime) might ironically have become a phenomenon of less importance.

2. In a dynamic situation, outcomes of the regime's operations (as well as "outside" developments) can easily change the principal actors' perceptions of their policy goals and the best ways to approach them.⁹ They may raise hopes (and quantitative or qualitative targets) or, alternatively, induce caution. The generally successful operation of the North American gas and electricity regime has bolstered the energy security (and arguably the environmental quality) of all three countries -- leading constituents and their representatives to be more ambitious about future possibilities. By contrast, the "bumps in the road" this regime has experienced have led to some "backing and filling" in the ground rules by which it operates. Eventually, the interlacing of energy investments and

⁹ Krasner acknowledges this feedback on p. 362: "Regimes may change the interests that led to their creation in the first place by increasing transaction flows, facilitating knowledge and understanding, and creating property rights." (Note also that property rights in the pipeline and power lines that have multiplied the tri-country linkages are major ingredients in the "ratcheting effect" referred to repeatedly in this dissertation.)

projects could strengthen the case for improved official mechanisms of joint planning and dispute resolution.

In relatively rare instances thus far, “fine tuning” may take place trilaterally and on a national level -- through a mechanism such as the NAEWG. An example is the move to harmonize product standards and labeling in the interest of energy conservation and efficiency. More commonly, though, reflexive actions are taken by one country (or even one part of a country) at a time. Such a move is exemplified by the Fox administration’s persistent efforts to improve the “groundrules” for private involvement (technological and financial) in natural gas development by such devices as “multi-service contracts”. A less salutary example at the subnational level would be the continuing attempts by state and local officials and some NGOs in California to compel Mexico to match the most stringent U.S. environmental standards for electricity generation by blocking power imports or by forbidding exports of the required natural gas fuel. In both cases, one of the results of the regime’s existence (namely, increased energy trade involving the heightened consumption of gas to feed CCCTs as demand for electricity grows) has become a stimulus for adaptive rule-change.

3. It is difficult (and it may even be arbitrary) to distinguish between feedback from the existence and activity of the regime itself and feedback from “related behavior and outcomes” (a factor I have broadened to include relevant changes in the global energy situation and in some non-energy factors within the three economies and polities). The degree of energy interdependence afforded by the North American gas-and-electricity regime has made the occupants of this continent (and the United States in particular) somewhat more confident in dealings with other oil suppliers. U.S.

dependency on extra-continental oil imports actually continues to increase, but the nation's vulnerability to serious economic disruption from a new "oil crisis" has arguably been reduced. This has at least some modest influence on its attitude toward OPEC, toward the especially petroleum-rich area of the Persian Gulf, toward Russia (a limited future alternative to Saudi Arabia as an international "swing producer"), and (in varying ways) toward Venezuela and other Andean nations in this hemisphere that are potentially complementary sources of natural gas in the form of LNG.

Washington has thus been somewhat less concerned than it otherwise might have been toward Mexico's flirtation with OPEC (especially since maintenance of oil prices within a discrete band – which Mexico has symbolically supported by its occasional token cuts in output -- benefits both of us). With its bold concentration on natural gas as the preferred fuel in new generating capacity, the United States has also come to recognize greater "national interest" in the gas resources of Qatar, the Caspian Basin, Siberia, and northern South America. It remains to be seen how this might play out in Middle East maneuvering . . . or even in negotiations of the Free Trade Agreement of the Americas.

Petroleum is expected to remain the largest primary energy source worldwide (as well as in North America) for decades to come; but consumption of natural gas is actually growing more rapidly now than oil (nearly twice as fast as coal).¹⁰ And it can hardly be denied that much of its global rise can be traced to North America, which is responsible for 30 percent of all gas demand¹¹. One might debate the chicken-and-egg relationship; but the encouragement by this regime of gas development has certainly correlated with

¹⁰ Energy Information Administration, *International Energy Outlook 2003*, Washington, May 2003, p. 12.

¹¹ *IEO 2003*, Table A5.

the fuel's surging significance in a broader context. The effects on geopolitics and the environment of a switch toward this relatively cleaner fuel (whose known resource distribution varies greatly from that of oil) could be profound.

For Canada, immersion in the continental energy regime heightens tensions between Ottawa and the provinces . . . and thus quite possibly exaggerated an obvious resentment toward the United States within the Chrétien government. The effects go beyond caustic innuendo relating to the Kyoto Protocol. Canadian utilities and provincial governments seem generally to have welcomed participation in NERC and cross-border Regional Transmission Organizations; but at the federal level there is bitterness among some about what they see as kow-towing by Canada's National Energy Board to regulatory initiatives spawned by a purely U.S. agency (the Federal Energy Regulatory Commission) – such as “open access” rules. The disaffected Canadians regard “national treatment” as a more suitable tool for the regime than an insistence on “reciprocity”.

Participation in the regime has probably affected Mexico more tellingly than either of its two North American partners. Although they might be reluctant to admit it publicly, most of that nation's economic and political leaders have become habituated in some fashion over the past decade to two-way energy trade, electronic energy trade (including the derivatives market), free-market operations in energy, and the gas-electricity convergence. Regardless of nationalistic rhetoric, a potent fraction of Senators and deputies from both of Mexico's two leading parties (not to mention governors, business leaders, and respected academicians) need no further evidence to accept intellectually the desirability of structural reform in the country's handling of energy.

Apart from a dwindling number of political Luddites, the chief remaining barriers within Mexico to movement in this direction are the country's labor unions and the demagogic threat from the left (especially in view of the popularity of Mexico City's PRD mayor). Tactical and strategic maneuvering will undoubtedly hinder the Mexican energy reform process during the lame-duck phase of the Fox administration, but the deciding factor will be the relative power of various elements in stretching toward some domestic consensus. Ultimately, Mexico not only has been affected most by the regime; it also stands to affect the future of that regime (via changes in rules, decisionmaking procedures, and even norms and principles) to a greater extent than either the United States or Canada.

Other forces (including some accidental ones) will introduce lags to this and other pathways of feedback causality for all three countries. These include tight budgets, increased risk-averseness, and disagreement among the national partners on geopolitical style and substance (with perceived U.S. unilateralism ranking high on the list).

Strengthening: Institutional and Physical Infrastructure

The formation, activities, and growing self-confidence of the NAEWG constitute the closest approach thus far to an institutionalization of the energy regime. Even with its limited responsibility (and more limited authority), the North American Working Group accords with Stein's description of "Institutions created to assure international coordination or collaboration". His view is that such entities "can themselves serve to shift decision criteria and thus lead nations to consider others' interests in addition to

their own. Once nations begin to coordinate their behavior and, even more so, once they have collaborated, they may become joint-maximizers rather than self-maximizers.”¹²

As indicated earlier, however, the NAEWG is primarily just a catalyst; and it is by no means the only catalyst -- or even the most significant one, most of the time. Underlying all future trans-border contacts will be the growing experience of business contracts and the expanding physical network of transmission and/or pipeline delivery. The actors associated in any way with gas and electricity trade – whether they are investors, producers, operators, vendors, or consumers – and whether they are governmental, quasi-governmental, or private – represent an elite (as seen by Hopkins and Puchala). They “have transnational as well as national ties.” They “act within a communications net, embodying rules, norms, and principles, which transcends national boundaries.”¹³

Many of the regime’s rules in respect to gas and electricity are established and enforced by three regulatory bodies – the National Energy Board in Canada, the Federal Energy Regulatory Commission in the United States, and the *Comisión Reguladora de Energía* in Mexico. Because the members of NEB, FERC, and CRE face generally similar dilemmas domestically and recognize the importance of cross-border energy contacts, they are starting to develop a modest degree of *camaraderie* that should favor a gradual harmonization of understanding.¹⁴ The planned publication in 2004 of an NAEWG document to summarize regulations and conditions of continental gas trade while projecting future requirements could help them to develop a sharper focus. The

¹² Arthur A. Stein, “Coordination and collaboration: regimes in an anarchic world”, in Krasner, p. 139.

¹³ Krasner, p. 9.

¹⁴ The same can be said for the heads of the three national environmental agencies – who come together regularly as commissioners of the CEC.

jolting experience of the 2003 power blackout in eastern Canada and the northeastern part of the United States has already done so.

Nevertheless, these bodies are creatures of national statute, which means they are subject to the whims of legislators and to legal interpretations by domestic courts. They are not totally independent of the federal executive in their respective countries. In the case of Canada and the United States, the exercise of their powers may be subject to serious resistance by provincial and state officials whose ideas about the proper goals of energy policy (and the decentralization of authority, in terms of basic principle) may differ radically from theirs.

Nor should one assume that intermittently appointed regulators will act uniformly. Decisions are reached by majority vote; and it would be naïve to assume that they are not sometimes influenced by partisan connections, personal ideology, prior experience, and the pressures of interest groups and the media. Still, the regime has gradually developed a body of rulemaking and precedents in administrative case law (sometimes modified by formal judicial rulings in the courts) that gives those involved in continental energy trade and cooperative ventures increasing assurance of what to expect in the future. It cannot be emphasized too much that rules within the regime need not be universal or uniform so long as they are mutually understood and acceptable. Beyond that, habits of action gradually produce a sort of “behavioral infrastructure”.

What does this say about the nature of change that has characterized this regime to date? Puchala and Hopkins undertook comparative case studies of various regimes and concluded that “regime change is closely linked to two classical political concepts –

power and interest.”¹⁵ The North American energy example seems to best fit their category of evolutionary (rather than revolutionary) change, which “occurs within the procedural norms of the regime, usually without major changes in the distribution of power among participants.” In fact, they went on to say that “Such change, undisturbing to the power structure and within the regime’s ‘rules of the game,’ is rather exceptional and characteristic mainly of functionally specific regimes.” In an explanatory vein, they had already observed that “Regimes may change qualitatively because those who participate in them change their minds about interests and aims, usually because of changes in information available to elites or new knowledge otherwise attained.”¹⁶

This all fits the North American gas-and-electricity example perfectly; but I would add a *caveat*. I do not rule out the possibility of revolutionary changes in the future, although their origins need not involve a change in relative power among the three countries. If transformations occur, I believe they are far more likely to arise from power changes within each or all of those countries. At present I do not foresee any such radical domestic power shifts, but if they were to occur and this regime were to undergo a “revolution” (e.g., via some change in norms that was more profound than simple rule modification), the result could be either strengthening or weakening of the regime.

The most probable areas for such major change lie in the goals and objectives associated with environmental protection and/or reliability of supply – partly because debate about them arouses such strong emotions. For example, the continued badgering by Californians of energy suppliers outside the state’s borders in an attempt to enforce their own precise set of emission rules and water-use practices on everyone else could

¹⁵ Puchala and Hopkins, *op. cit.*, p. 90.

¹⁶ Puchala and Hopkins, pp. 65-66.

eventually succeed or falter. If Mexican authorities became sufficiently motivated, they might undercut these complaints from north of the border by introducing for themselves a more rigid set of “new source standards” that would exempt existing facilities but apply to the most relevant initiatives in cross-border hookups. On the other hand, relations might become so stressed that future enhancements in energy interdependence for that region – such as introduction of LNG receiving facilities in Baja California to serve both Mexico and California – would be stalled. The same possibilities (admittedly rather remote in either direction) could apply to U.S.-Canadian exchanges of electricity because of seemingly irreconcilable interpretations of “renewable portfolio standards”.

Perhaps the most far-reaching change that might take place in the regime within the next few years, however, would be a firming-up of procedures for resolving disputes. This could come first in certain special circumstances through the long-postponed reinvigoration of NERC/NAERO (see Chapter IV); but that depends on thoughtful action by the U.S. Congress that has been elusive. The most rational response to the 2003 blackout might be a national commitment by both the United States and Canada to regional reliability planning (even across borders) with enforcement capabilities¹⁷; but a more populist (and counter-productive) reaction could be to try to reduce sensitivity to shocks by limiting electricity trade. This brings up a basic step in regime-strengthening that could promise sweeping change – namely, the willingness of national legislators of the three countries at some point to establish trilateral discussion sessions.

¹⁷ Although the *Interim Report* of the U.S.-Canada Power System Outage Task Force in November 2003 made no formal recommendations, it seemed to lean in this direction with its observation that “Recent changes in the electricity industry have altered many of the traditional mechanisms, incentives and responsibilities of the entities involved in ensuring reliability, to the point that the voluntary system of compliance with reliability standards is generally recognized as not adequate to current needs.” (p. 8)

A final source of future change (as unpredictable, yet as realistic, as any other) lies in technological advances. Stein recognizes that these may bring regime changes by modifying interests.¹⁸ One could speculate endlessly about what might be involved: some breakthrough in superconductivity, unconventional hydrocarbon recovery, modes of transportation for people and goods, distributed generation, heat-to-electricity conversion, or a multitude of other possibilities. Any of them might either expand the value of cooperation within the regime or make association with it less necessary in order to achieve policy goals.

In musing about what might happen, it is useful to keep in mind that energy interdependence is not synonymous with the regime, although it is, simultaneously: 1) one of its causes, 2) one of its principles, and 3) one of its products. Therefore, anything that deepens or extends energy interdependence is likely to strengthen the regime. Anything that undercuts energy interdependence will likewise be mirrored by some change in the regime -- either a diminution of its effectiveness or (somehow) a transformation of its very nature.

Weakening: Burdens of Uncertainty and Suspicion

This regime, like any other, is weakened whenever its constituents begin to take exception to its rules and norms. That has occurred to a certain extent in North America, although the damage is still not life-threatening.

There is no doubt that the regime has lost some forward momentum as the pace of integration for the three countries' gas-and-electricity networks has slackened. Current benefits seem less obvious than they did two or three years ago, and some anticipated

¹⁸ Stein, *op. cit.*, p. 138.

benefits – such as the augmentation of continental gas supplies by pipeline capacity from the far north and sharply increased production to the south -- have been delayed. More seriously, suspicions have grown (within and about the energy industry) as to whether or not energy policy goals are being served as well as they might be by industry restructuring, “open access”, and greater reliance on competition. At the same time, relations between the United States and its two neighbors were undergoing a temporary chill overall as a result of political disagreements at the United Nations.

The most severe threat to North American energy interdependence to date has come from the instabilities of energy supply and energy prices in California that seized national and international attention during 2000-2001. A series of rolling blackouts, declaration of bankruptcy by the nation’s largest regulated local gas-and-electric utility, and a wave of price increases that shut down chunks of industry resulted in the first concerted campaign to roll back some of the regulatory reforms that had been a central factor in developing and nurturing the continental market. The widespread 2003 blackout heightened misgivings, although quick consultations between energy leaders (public and private) from Canada and the United States helped to establish the conclusion that more -- not less -- regional cooperation might be in order.

What are the symptoms of health or weakness for the regime? The convergence of expectations about the “ground rules of interaction” yields a coherent regime. On the other hand, uncertainty about whether or not rules and norms will be respected (or even remain intact) weakens the regime’s effectiveness and attractiveness. And there are some troubling examples of uncertainty that merit reviewing:

In Canada, the specter of commitments under the Kyoto Protocol heightens qualms about the future of Alberta's oil sands and supplemental gas production in the form of coalbed methane. Can provincial ceilings be maintained on retail electricity rates (a counterintuitive measure in the light of energy conservation goals, and also violative of the spirit of market pricing implicit in the interdependent regime)? Will they even work?

In Mexico, insecurities continue over recurrent challenges to the constitutionality of energy reforms . . . and over the ability of courts, a divided national legislature, and the executive branch to find a basis for cooperation that is politically viable domestically. This leaves some independent power producers, pipeline operators, many energy consumers, and potential new players in limbo for the time being.

In the United States, the cast of actors within the regime has changed continually as once innovative companies flounder, merge, drop out of the game, or even vanish. FERC and DOE have both suffered losses in prestige from the broad public perception of runaway prices¹⁹, regulatory paralysis, and dishonesty in the energy field. The U.S. Congress has shown itself to be more intent upon protecting local interests than in adopting comprehensive energy legislation that might help achieve national and continental policy goals.

Regulatory monitoring has been stepped up in all three countries (which is a good thing); but it is unclear when or how a new balance might have to be struck among objectives of supply adequacy, reliability of delivery, cost, and environmental protection.

¹⁹ In reality, Tables 9.9 and 9.11 of the *MER* for May 2004 show that city gate prices for gas and average retail prices for electricity fell in the United States during 2002. For all of 2003, it was estimated that gas prices exceeded the 2001 levels by only 2.45 percent while electricity prices had risen only 1 percent.

It also remains to be seen how the current enthusiasm for liquefied natural gas will play itself out. One feature that Fed Chairman Greenspan and other supporters have failed to address is what might happen if reopened and new LNG facilities are unable to operate at or near full capacity in the future – as seems quite likely. Since all must be located near pipeline delivery networks, they still might prove useful for storage of conventional gas; but their regasification equipment could prove difficult to amortise. Who will be responsible for these new “sunk costs”? Will a cry arise for new subsidies? Will there be new pressure to subvert honest price competition – one of the advantages of continental interdependence?

Obviously, the regime must continue to adjust in order to thrive. It may have to endure new attacks. Nevertheless, it has only slowed down; it has not stopped developing. It now appears strong enough to survive, largely because the cost to each of the three countries of allowing it to collapse would be too great. Each government would be hard-pressed to demonstrate any advantage in returning to old, independent ways of dealing with gas and electricity. Instead, each would face immediate costs if it tried to extricate itself from the continental regime.

Ratcheting: Costs and Likelihood of Defecting

Once energy interdependence has been established to the degree it now exists in North America, there is no turning back. A *de facto* regime of some sort is essential. Defection simply offers too many problems, without any perceptible advantages.

It is reasonable to foresee that wholesale prices would rise on average if competing sources of supply were reduced – as they would be if the gas-and-electricity regime collapsed. Effective demand would drop too, but this would also be a negative

because all three countries are themselves significant producers – whose capacity for investment in future development is contingent on an assurance of market outlets. A thinner derivatives market would make hedging tools less adequate; and that would raise investment risks and further encourage price volatility. Shortages could become more common, and their duration would increase . . . because there would be less reserve generating capacity and gas storage in the picture. To preserve a greater semblance of reliability, relatively dirty and inefficient old power plants would have to be kept in service longer and called upon more often; but this means that air quality would decline. Pipeline and powerplant operators would suffer; and, in all probability, some contracts would be broken.

The rules and procedures of the North American gas-and-electricity regime will surely continue to evolve. Current patterns of oil trade for the continent (including both crude and refined products) are likely to change as well.²⁰ It is also possible that the overall political, economic, and socio-cultural relationship among the three countries could be modified in ways that would be reflected in the regime this dissertation has sketched. But – barring some catastrophic development – their energy interdependence will persist. The connective structures are too deeply embedded into the respective lives of the citizenry to abandon without some overriding reason; and no such reason seems credible.

Kenneth Waltz has suggested that “Two or more parties . . . are interdependent if the costs of breaking their relations or of reducing their exchanges are about equal for

²⁰ For example, the volume and direction of oil trade could both be affected by the construction of more modern refining facilities in Mexico, all-out development of oil sands, some technological breakthrough in respect to ultra-deep drilling in the Gulf of Mexico, or – although I personally consider this unlikely – a serious effort to reverse the growing thirst of the transportation sector for petroleum.

each of them.”²¹ (emphasis added) This does not demand an exact equivalency in the respective perceptions of pain to be suffered from withdrawal. It simply implies that no rupture will be seen as desirable unless there is at least a prospect of relative gain for the party that defects. In this case, however, the initial reasons for participation in the regime were purely egoistic and related to net absolute gains – which remain the motivating force. They coincide with national goals (see the matrix of regime effects in Chapter VII). In almost every instance, moreover, the possible disadvantages of participation noted in that matrix are most subject to attenuation in one way or another through the regime. For instance: 1) Dangers of “pollution havens” can be minimized by ongoing negotiation. 2) Failings in regulatory reform can be corrected more easily in connection with policy harmonization. 3) The reduced risk provided by a broader market encourages the capital investment needed to fortify physical infrastructure.

As noted earlier, relative power is primarily a consideration on the individual domestic levels – in connection with how change ought to be pursued within the regime, rather than how it might be compelled by state-on-state pressure. This brings us back to some definitions and taxonomies from Keohane and Nye. Those authors referred to international regimes as “the sets of governing arrangements that affect relationships of interdependence.” Their broad view saw regimes as “intermediate factors between the power structure of an international system and the political and economic bargaining that

²¹ Kenneth N. Waltz, *Theory of International Politics*, McGraw-Hill, New York, 1979, p. 143.

takes place within it.”²² They went on (in one entire chapter and parts of several others²³) to explore the strengths and weaknesses of four models to explain regime change:

- The first model (Overall Power Structure) “rests on the premise that the strong make the rules”²⁴ – even in international regimes.
- The Economic Process explanation is actually a particularization of conventional power politics, because it recognizes that “economic bargaining is affected by the uneven distribution of effective demand -- the wealthiest consumers have the most votes in the market – and by the rules and institutions that reflect past patterns of strength.”²⁵
- The Issue Structure approach is conceptually similar, but it holds that “the strong states (in an issue area) will make the rules.”²⁶
- The International Organization model sees “governments as linked not merely by formal relations between foreign offices but also by intergovernmental and transgovernmental ties at many levels” – ties that “may be reinforced by norms prescribing behavior in particular situations, and in some cases by formal institutions.”²⁷

²² Keohane and Nye, p. 18. Note that this passage in the first printing of the Third Edition contains a typographical error (reading “with” instead of “within”. I have reverted to the text which appears on p. 21 of the Second Edition – which makes more sense and is undoubtedly what was intended.

²³ In Keohane and Nye, see Chapter 3, “Explaining International Regime Change” (pp. 33-52), but also pp. 120-137 (in respect to issue-oriented ocean-management and monetary regimes), pp.182-190 (interesting because it examines some of the politics in the overall relationship of complex interdependence between Canada and the United States), and 278-286 (in which the authors verge on declaring an “intermestic” answer).

²⁴ Keohane and Nye, p. 114.

²⁵ Keohane and Nye, p. 34.

²⁶ Keohane and Nye, p. 43.

²⁷ Keohane and Nye, p. 47.

Keohane and Nye referred repeatedly to the failings of overall structural considerations in appreciating interdependence and regimes involving asymmetrical actors; and I concur. I find that each of the other three models has some relevance to the North American gas and electricity regime, and that the fourth comes closest to describing this situation. Yet Keohane and Nye themselves were still not completely satisfied with any of the four when they wrote an “Afterword” for the second edition of *Power and Interdependence*, published in 1989. With somewhat exaggerated humility, they apologized that their “understanding of international regimes remains rudimentary” and that they lacked “convincing explanatory theories” of how change takes place within them. They added:

Nor are we likely to have such theories of change without better incorporation of domestic politics into our models. The nature of international regimes can be expected to affect domestic structures as well as vice versa: the flow of influence is surely reciprocal between international institutions and bargaining on the one hand and domestic politics on the other.²⁸

In the Third Edition (published in 2001), neither their additional preface nor the two new chapters attempted to provide a single, generalized explanation of regime change – probably because they saw “so much variation among regions and across issues.” They did, however, note that their “issue structure” model had proved more satisfactory over the intervening years than one based purely on power structure.

I do not pretend that the analysis offered in this dissertation solves the long-standing problem of regime change neatly or completely. Keohane and Nye warned that “it is unlikely that any single model (of regime change) will fit all situations”.²⁹ The regime I have described is an issue-specific one – unique in many respects. It is

²⁸ Keohane and Nye, p. 279.

²⁹ Keohane and Nye, p. 188.

problematical whether or not even its basic causal factors will apply to a region such as the European Union in its development of a gas-and-electricity regime (a direction in which it has tried to move for some time). Yet I believe my exercise has been a potentially fruitful one because it does describe how mutual interests in a limited type of interdependence can trump asymmetries. It admits the bargaining power of “bigness” in market matches between supply and demand; but it also takes account of the fact that the distribution of power among nations in respect to specific resources and commodities may not correspond at all to the division of general economic power (much less such factors as population size and military strength). Most important of all, it offers a reasonable explanation of an intermestic and decentralized process that may underlie regime stability at the same time it permits (indeed, encourages) evolution.

Decentralization of decisionmaking (guided by decentralization of power within discrete segments of the regime – including NGOs and subnational entities) represents strength and endurance; but it also promotes more frequent change. In fact, one region or another could even defect (as California sometimes seems prepared to do) without destroying the rest of the regime – which could then work out some way to adjust. A national defection, on the other hand, would have to involve public repudiation of the regime’s principles at the highest levels or conscious governmental opposition to one or more of the four causal factors. This offers no conceivable advantage, however, so there is no incentive to withdraw.

Keohane and Nye use a bold subheading to underscore their conviction that in regimes “The Best Enforcement Is Self-Enforcement.” This hearkens back to my analogy in Chapter I of this dissertation to Barrett’s endorsement of environmental treaties that

are “self-enforcing”. Since conventional differences in power levels have less of a role to play, Keohane and Nye reasoned that “If states are to comply with regime rules, they must do so on the basis of long-term self-interest.”³⁰ Regimes help the states to recognize the validity of such compliance through each of the four functions the authors consider characteristic: 1) Regimes facilitate burden sharing; 2) they provide information that may reveal substantial shared interests; 3) they lend focus to multiple and varied interests within the state; and 4) their rules “help reinforce continuity when administrations change” and “set limits on constituency pressures . . .”³¹

In respect to the final function, I suggest that the North American regime offers a body of practices around which divergent interpretations of subnational and partisan interests are offered at least some incentive to coalesce (namely, that energy policy goals are being served). Continued adherence to such practices (or decisions to seek change in them) are most usually a result of elite attitudes; and this is why the information function of this regime – exercised in large part through transnational actors – must also be acknowledged. The test comes when the perceptions of such elites change – perhaps radically. This may take place for various reasons, but . . .

The most obvious is political change. An election coup, or generational evolution can lead to a replacement of leaders and thus bring in quite different viewpoints about national interest.

All three countries have experienced changes in top leadership since the turn of the decade, and they face the possibility of others within the next few years. Was the regime “lucky” to survive the first waves of changed leadership? Should there be uneasiness about the next? I think not . . . on both counts.

³⁰Keohane and Nye, p. 295.

³¹Keohane and Nye, p. 292.

For example, if Mexico had seen fit in 2000 to choose as its new president a “dinosaur” from the long-dominant PRI (such as Manuel Bartlett Díaz, who was defeated in his party’s primary by a relatively colorless candidate) or an avowed opponent of NAFTA (such as Cuauhtémoc Cardenas Solórzano, of the PRD, whose father had nationalized foreign oil companies), it is safe to assume that there would have been less transparency than there is now in Mexican energy pricing and in the issuance of operating licenses for various power production and energy delivery facilities. If Al Gore had become the 43rd president of the United States, a different sort of emphasis might be placed today on the Commission for Environmental Cooperation created by a NAFTA side agreement. But a Gore administration would hardly have tried to torpedo continental cooperation in gas and electricity that had already evolved to a high degree. The three-nation regime would have survived in any case – although perhaps in slightly altered form.

To a far greater degree than his father, George W. Bush is a dedicated Texan. His international experience prior to assuming the presidency was limited almost exclusively to cross-border relations between his home state and Mexico. So far as energy is concerned, those contacts had been cordial throughout his political life. Former oil entrepreneur Bush also welcomed the prospect of broader opportunities to explore, produce, and either buy or sell energy within an expanding market. Relations with Canada have been noticeably less cordial; but the relative “issue power” that country holds as an irreplaceable supplier of natural gas was enough to overcome personal pique between leaders.

President Fox had been a businessman too (and one with successful connections to the north), rather than someone who had climbed to the top of the Mexican political pyramid through a largely inward-looking PRI bureaucracy. He had won his single term as governor of Guanajuato despite resistance from the centralized authority of the *Distrito Federal*; and the party that nominated him (PAN) found its greatest strength in border states. PAN had also supported Mexico's first important steps toward more open energy trading in more than half a century, which were taken by PRI Presidents Salinas and Zedillo -- his two U.S.-educated technocrat predecessors in *Los Pinos* (the Mexican White House).

Canada has expressed the least enthusiasm for trilateral approaches to the energy picture – preferring to address this area (like many others) “bi- and bi” (bilaterally with the United States and bilaterally with Mexico). Furthermore, Prime Minister Chrétien made no effort to play down differences in “official energy policy” between his administration and Washington (e.g., on the Kyoto Protocol). At the same time, representatives of the Canadian energy industry have recognized the opportunities provided by energy interdependence. They have continued to invest heavily in pipelines and powerplants in both Mexico and the United States. To a greater extent than government officials in Ottawa, Canada's provinces and its corporate sector have shown a willingness to back the transition of NERC to a more effective NAERO. And it seems obvious that the provincial premiers who opposed Chrétien so vigorously in the matter of Kyoto would always find ways to avoid any serious blow to the energy interdependence that is so valuable to them economically.

What about the most likely scenarios for leadership in the future – and their ramifications? In the United States, some Democratic candidates campaigning for President in the 2004 election showed little sympathy for NAFTA (or for the energy industry); and all expressed dedication in some degree to a form of “energy independence”. Yet the realities of the upcoming Congressional contests almost guarantee that any Democrat (including presidential nominee John Kerry) would have to cope with sufficient Republican legislative strength to make a major change next to impossible; and the North American regime has “caught on” sufficiently so that reliance on energy trade with Canada and Mexico is no longer regarded in either party as equivalent to the hated “dependence on foreign imports”.

In Canada, the succession of Chrétien by Paul Martin is considered favorable to bilateral relations and perhaps even to trilateral cooperation within North America. Mexico’s future is less certain, and it will depend in part on the extent to which electoral, fiscal, and energy reform can be eked out of the mixed-up Congress. But the electability of an ultra-nationalist PRI candidate in the next national election seems to be even lower than it was in 2000; and a PRD President in 2006 is less of a clear threat to an outward-looking Mexico. Lopez Obrador’s dalliance with the money men of the capital pegs him as a follower in the footsteps of Cardoso and Lula da Silva in Brazil – longtime leftwing leaders who turned sharply toward free-market principles and moderate budgetary and economic styles once elected to the top office their country.

This dissertation began with the observation that Canada, Mexico and the United States were starting the 21st century uniquely interdependent in the two economic building blocks of gas and electricity. Adverse circumstances have slowed the rate of

progress in their further integration, but the regime constructed to safeguard this aspect of interdependence is still strong. It bodes to remain so.

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A great many "trade journals" are available free to persons active in the energy business and to serious researchers. Their news articles and feature coverage are basically objective and also helped keep up with this complex and fast-changing field. Among the ones consulted most frequently for this work were *Hart's Energy Markets*, *Platt's Energy Business & Technology*, and *Global Energy Business*.

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Interviews

A considerable amount of the research for this dissertation was carried out through interviews in the United States, Mexico, and Canada -- where the interviewees included high current and former officials of all three governments. Many are cited in the text; but some preferred to remain anonymous. Even an admittedly partial list of those with whom extended face-to-face or telephone conversations took place over the years this work was in progress must include the following:

Francisco Barnés de Castro, David Bardin, Steven Bosworth, Lynn Church, Julie Coppola, Louis DeMouy, Vincent DeVito, Kathleen Deutsch, Charles K. Ebinger, Juan Eibenschutz, Jake Epp, Ernesto Estrada, Saul Feder, Bill Garner, Les Goldman, Carl Hartill, Armando Jimenez Vicente, Julius Katz, Patrick Lucey, Kay McKeough, Ken Malloy, William F. Martin, Lorenzo Meyer, Elizabeth Moler, Ewell H. Muse, José Andrés Oteyza, Robert A. Pastor, David Pumphrey, Robert Reinstein, Jesus Reyes Heroles, Carlos Rico F., Henry Santiago, Kelly Staudt, David Shields, Jack Ray, Andrés Rozental Gutmán, James R. Schlesinger, Jorge Díaz Serrano, Terence A. Todman, Cecil Thompson, John Treat, and Natan Warman,

These interviews and discussions were complemented by numerous less formal conversations with government and corporate officials, other engaged members of the private sector, and academics from the same three countries. The additional contacts of this type were too numerous to try to list, for fear of almost certain inadvertent omissions; but special note should be made of continuing assistance provided by the Embassies of Canada and Mexico in Washington, the respective energy and environmental ministries, and a panoply of energy trade associations.

Key Internet Sources

“Country Analysis Briefs” for Canada, Mexico, and the United States of America are useful and reasonably comprehensive documents that are revised periodically and made available without charge at <http://www.eia.doe.gov> by the Energy Information Administration of the U.S. Department of Energy. Each one contains links to relevant sources (official and unofficial) in each respective country. Successive issues of these “CABs” were examined as each new edition appeared over a period of more than five years in the preparation of this work. The same website provides access to most current and older reports by EIA.

Energy and Environment Daily and *Greenwire* (both publications produced in Washington and made available to paid subscribers via a limited-access website) have also been consulted regularly for years.

Energy Daily stands out in the field of energy newsletters, but (like many such “inside” publications) is fairly expensive. It was consulted irregularly, except for the 1977-79 period –for which, in deference to the intense scrutiny of the U.S.-Mexican gas negotiations featured in Chapter VI, every issue was reviewed.

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CURRICULUM VITAE OF JOSEPH M. DUKERT

Born: Baltimore, Maryland -- September 19, 1929.

Education: B.A. in journalism, *magna cum laude*, University of Notre Dame (1951).

Graduate courses in geopolitics and advanced language training, Georgetown (1951-2).

U.S. Army psychological warfare program (with honors, 1952). Graduate courses in

international law and political science, Johns Hopkins (1954-55). Completed SAIS,

Bologna Center with honors, 1955-6. M. A., international relations, SAIS (1993).

Academic and professional honors: Full scholarships to high school, college (forerunner to National Merit Scholarships), and Bologna Center, SAIS. Passed written and oral exams for U.S. Foreign Service, but declined appointment as FSO (1956).

Served 10 years on Advisory Committees at U.S. State Department. Named Senior Fellow, U.S. Association for Energy Economics among three “individuals who have exemplified distinguished service in the field of energy economics” (2004).

Teaching Experience: Taught German and persuasive writing in U.S. Air Force’s psychological warfare program. Co-taught (with Professor Wilfrid L. Kohl) introductory course in energy and environment at Johns Hopkins SAIS for four years.

Research Experience: Has worked as a consultant to national and international government agencies, think tanks, trade associations and private corporations since 1965 on projects involving various energy sources, from nuclear power to renewables.

Publications: Author of numerous books, monographs, and journal articles -- ranging in subject from peaceful applications of nuclear energy to differential effects of high-cost energy, as well as energy history, energy policy, and North American energy markets.

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370