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The Quiet Reality of North American Energy Interdependence

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**Mapping the New
North American Reality**

**IRPP Working Paper Series
no. 2004-09h**

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North America contains the world's largest integrated energy market, whose importance and benefits few people recognize. In 2003, four Canadian provinces were net importers of US electricity, but four others were net exporters. Canada and Mexico each roughly match Saudi Arabia as suppliers of US oil; and the United States relies heavily on natural gas from Canada; yet Mexico uses US gas for its fast-growing system of generating units ...which send some electricity back across the border. A trilateral North American Energy Working Group now meets twice a year (with subgroups forging a cooperative picture of the continent's energy future), while three separate regulatory bodies aim at "conscious parallelism." Nevertheless, a hodge-podge of subnational rules and tradeoffs among priorities pose challenges. Legislators need a clearer grasp of this complex system.

With scant public or press attention, North America has spawned the largest integrated energy market the world has ever seen. Trilateral cooperation among its three sovereign nations is especially evident in respect to natural gas and electricity, whose availability and price are continually affected by the trans-border pipelines and power lines that have multiplied in the past decade.

Furthermore, the continental market accepts common principles that political observers would have deemed improbable as recently as 1990. Ground rules vary from country to country, but traders and investors are finding them more transparent than ever before, and three distinct national energy policies are moving slowly toward harmonization.

Although the United States depends on both Canada and Mexico as major sources of crude oil and refined petroleum products, it exports smaller but critical volumes of each to those same countries — largely because of production and refinery locations. And for years a big Canadian gas pipeline from the west has swung down across the US northern tier before returning to Canada's eastern population centers. Similarly, any line to tap northern Alaska's gas will have to cross part of Canada to reach the Lower 48.

Energy trade goes back and forth routinely, with clear benefits for both buyers and sellers. Energy supply has become more reliable for all three countries (especially on a regional basis), environmental protections

have improved, and efficiencies (which relate inevitably to cost) are growing. The three countries of North America did not start out in the early 1990s to create trilateral energy interdependence, yet that is clearly what we have now. Continental oil and electricity exchanges both doubled between 1990 and 2000, and gas trade grew even faster.

The relationship is not limited to one-way trade between recognized suppliers (Canada and Mexico) and an energy-hungry economic giant in the middle (the United States). Several Canadian provinces regularly exchange more electricity with US states than they do with adjoining provinces in their own country; and the net flow internationally may go either north or south in any given year, depending on circumstances. In 2003, according to the Canadian Electricity Association, Alberta, Saskatchewan, Manitoba and Ontario were all net importers of electricity from the United States, while British Columbia, Quebec, New Brunswick and Nova Scotia were net exporters. The United States has also become a consistent net exporter of natural gas to Mexico, but trade patterns along the southern US perimeter could change. The recent trend in cross-border pipeline construction is to plan each one from the outset for reversible flow as needed.

Twice a year, representatives of the three energy ministries meet now as the North American Energy Working Group (NAEWG). Official energy planners are developing joint computer modeling systems that can be applied to the entire continent as a unit, and a joint steering committee proposes "strategic areas of interest" in technology to guide cooperative R&D efforts. The most ambitious sub-group has been working on a collaborative "Vision of the North American Gas Market," originally scheduled for release by early 2004 but now delayed by various degrees of political uncertainty in each country that are not tied exclusively to energy.

Developments over the past 10 to 15 years have not been (and could not be) imposed by any sort of supranational authority. Yet North American energy interdependence is becoming institutionalized. Inside and outside government — and at both national and regional levels — energy collaboration has been formalized to an extent that the news media, non-energy officials and many academics fail to appreciate.

The new paradigm is important to all three countries, and to the world. This partnership is a matter of security, as well as economic sense. Pipelines and power lines are binding us together; the three energy systems are converging.

As a continent, we are essentially self-sufficient in natural gas and electricity — despite a higher plateau for domestic gas prices and the related fact that it will be advantageous to import some liquefied natural gas (LNG) as a global gas market starts to emerge. Spurred in part by Federal Reserve Board Chairman Alan Greenspan's 2003 warnings to the US Congress that production in mature US and Canadian gas fields is slowing down, regulatory approvals are being pressed to reactivate, expand and complement facilities to receive liquefied natural gas in all three countries. In a well-connected continental market, electronic trading can produce enough competition to make marginal-cost pricing a realistic possibility. By satisfying only a relatively small percentage of continental demand, LNG should reduce the price volatility of gas considerably.

Findings of a recent natural gas study by the National Petroleum Council were distorted by selective quotations emphasizing that “traditional North American producing areas” would be “unable to meet projected demand.” Non-traditional areas (including the Canadian Arctic and Alaska) are on the verge of becoming reliable supply sources via two separate pipelines from the Far North. Similarly, the power blackout of August 2003 (which started in Ohio, but extended quickly into parts of Canada) brought outlandish political charges that the North American grid was in a class with Third World countries. The reality is otherwise. One reason for its capability (and impressive success over the years) is the international cooperation that typifies the North American Electric Reliability Council (NERC) — a unique non-governmental organization that functions with public and private representation from the US, all of the Canadian provinces, and Mexico's Comisión Federal de Electricidad (CFE).

NERC preceded NAFTA by many years, but much of the “togetherness” in energy grew out of the North American Free Trade Agreement and the side-agreement that also created the trilateral Commission for Environmental Cooperation. Other integrating factors include those developed independently in the private sector — partly through mergers, acquisitions, and joint ventures of various types. The gas and electricity industries themselves have converged, as a result of the increased use of gas-fueled generating equipment and thanks to electronic billboards and futures-hedging in the marketplace that serve both. Separation of production and delivery systems have encouraged across-the-board “energy marketers” to trade in pipeline and power-transmission space as well as both gas and electricity — depending on regional changes in supply, demand, and price. Regulatory restructuring (which varies considerably across the three countries) has made price competition a continental reality for the first time in history. It is fortunate that the top federal

energy regulatory bodies for the three now hold multiple meetings each year to compare notes and to try to develop parallel (though not identical) approaches to ever-changing problems and possibilities.

Is there room for improvement? Certainly. But it was heartening, for instance, that the blackout investigation — and the search for ways of making such incidents even rarer — was carried out jointly by officials of the United States and Canada, in close cooperation with the North American Electric Reliability Council. Unfortunately, the US Congress has dragged its feet on legislation that would provide governmental means of enforcing certain reliability standards set by consensus within NERC. Canadian officials and private-sector spokesmen alike endorse the principle of a self-governing international organization with mandatory powers. The one Mexican state whose electricity grid operates synchronously with the adjoining one in the United States (Baja California) would probably go along too, in its own local interest.

Increased use of natural gas to generate electricity has helped markets for those two energy forms to converge smoothly. Demand for them often peaks at different times and in different geographical regions. Electronic trading and increased competition among alternative suppliers and consumers have dovetailed with the expansion of wholesale delivery networks. Clean and highly efficient gas-fired generating units are being built in northern Mexico at an accelerated rate — using US-supplied natural gas in many instances, and sometimes designed to supply power to both countries.

The recent recession, unstable gas prices, the Enron scandal, and the 2003 blackout definitely slowed the trend toward solidifying energy interdependence; but all of those negative factors combined could not reverse it. North American energy trade (although still a minor fraction of all NAFTA commerce) regularly exceeds \$50 billion (US) each year, and it is almost sure to grow. Continental trade contributes to the adequacy, affordability, reliability and overall environmental acceptability of energy — which remains the lifeblood of every society and economy. Ultimately, the physical connections bring with them a greater degree of security for each country, and for individual residents of North America.

By curbing growth in energy demand, the economic slowdown of 2000-03 has made risk-capital harder to attract. But so many new cross-border links were forged before that lull that those physical bonds alone make gas and electricity interdependence for the three countries essentially irreversible. Once installed, the

value to both buyer and seller of those delivery channels for energy tends to produce a ratcheting effect, so that only forward movement can occur.

The United States is far and away the largest consumer of energy in North America, but also the largest producer. The United States imports from Canada about one-sixth of all the natural gas it consumes; but geographic convenience also makes it a net exporter of that same fuel to Mexico —which has consciously been switching its traditional dependence on oil-fired generation to cleaner-burning natural gas for environmental reasons. With so many new facilities needed, it is fortunate that some private investment is now allowed to complement Mexico's historical parastatal monopolies.

The process of coming together is a slow one. The patterns of ownership in the three countries are different, and they are likely to remain so, but three-way consultations and cooperation will persist and broaden.

Do not look for a continental "energy constitution" or a single North American energy policy. Policy-in-practice is a result of many forces. Primarily it comes from consensus within each country on the basis of (perceived) national interests. Those interests reflect current interpretations of how best to balance certain implicit goals in respect to energy: 1) relative affordability; 2) adequacy and reliability of supply; 3) the protection of public health, safety and the environment; and 4) timeliness. The marvelous flexibility of the continental relationship is that — in different ways — a smoothly functioning system of energy interdependence serves the interests of each country.

Some difficult questions must be addressed as the three energy systems draw closer together. Canada's oil sands are an unconventional resource that recently has become a potentially economic source of petroleum surpassing every other country in the world except Saudi Arabia for sheer quantity, but its exploitation raises environmental challenges, and it could affect the supply and price of natural gas in ways that would necessitate market adjustments. Disparate US requirements at the state level threaten the role of electricity supplied from large Canadian hydro facilities (barred from customary favorable treatment as renewable energy) and from some new Mexican generators (which are cleaner than existing units in California and which satisfy environmental rules in almost every other state, yet fall short of the latest California regulations). Mexico's President Fox is a virtual lame duck, with even less congressional strength since the

2003 elections; so even modest additional energy reforms that could further mutually beneficial interdependence are on hold until 2007.

On the other hand, there are some important drivers toward energy integration:

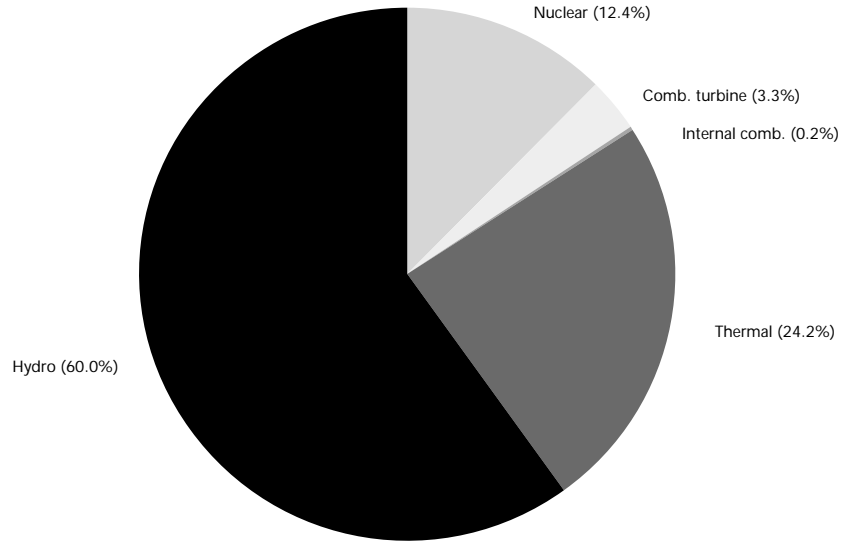
- 1) Regional groupings of governors and provincial premiers have been operating for years (across borders in the northeastern US, the north-central region, far west, and the southwest), and they represent a pool of interest in continental energy teamwork that could become a pool of power for common interests.
- 2) Much of the momentum toward energy interdependence during the 1990s came from the private sector. With an economic recovery underway, it is surely no coincidence that the TransCanada Corporation moved in February 2003 to acquire two pipeline segments that bring it close to having its own uninterrupted conduit from British Columbia to northern Mexico.
- 3) Nongovernmental organizations (NGOs) have barely begun to establish transnational bonds that acknowledge continental issues in economics, politics, labour and the environment — all related inevitably in part to energy.

The wild card rests in the hands of federal legislators for the three countries — who have never met trilaterally, but who could accomplish worlds of good if they could be encouraged to learn about one another functionally within a North American venue. A breakthrough meeting of this type would be difficult to arrange during 2004, with national elections scheduled in both Canada and the United States. But the chairman of the Foreign Relations Committee of Mexico's Chamber of Deputies has pursued discussions with top US congressional leaders recently, and she hopes that one might be possible in 2005 or 2006.

Obviously, such federal legislative conferences would involve agendas that are much broader than energy alone, although it is hard to imagine that energy would not be discussed. Understanding how far we have come toward energy interdependence (and how it is developing) might even persuade some of those lawmakers to help press the idea: "Think continentally. Act regionally."

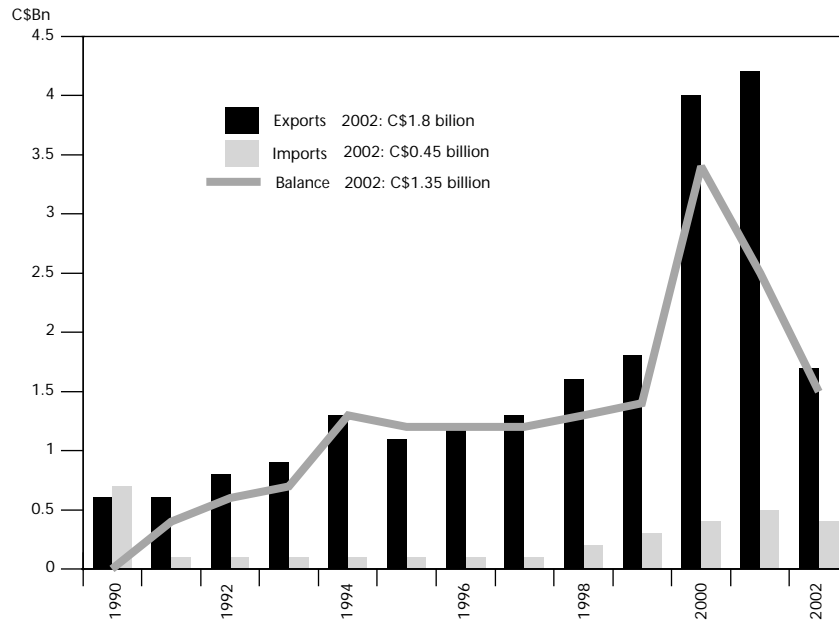
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FIGURE 1. CANADA ELECTRIC POWER GENERATION, PERCENT OF TOTAL, 2002



Source: Canadian Electricity Association.

FIGURE 2. CANADIAN ELECTRICITY TRADE, 1990-2002 (C\$ BILLION)



Source: Canadian Electricity Association.