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**Integrating BC into the Continental Energy Network - Some Issues:  
From notes for a presentation to the Association of Washington Geographers  
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Perhaps a good symbol of energy geography in our shared bio-region is the way that Victoria and Tacoma now view hot tubs. Because of the severe *water shortage* in Victoria, we don't let you fill your hot tub, and because of the *energy shortage*, Tacoma Mayor Mike Crowley had said he doesn't want you to *heat* your energy-wasting hot-tub. Certainly, with recent front-page headlines in Canada's *National Post* (a conservative newspaper that is generally pro-free trade) that read, "Canada Becoming US Fuel-tank"<sup>1</sup>, our bilateral energy issues will promise to be interesting in the near future!

While Victoria is only 50 miles from this Association of Washington Geographers conference site

at Western Washington University, the energy crisis doesn't appear to have made more than a very low-profile appearance in our city - and at this time only for natural gas price increases. The energy connexion of British Columbia to California *has* made an impression on us, such is in our local newspaper (Figure

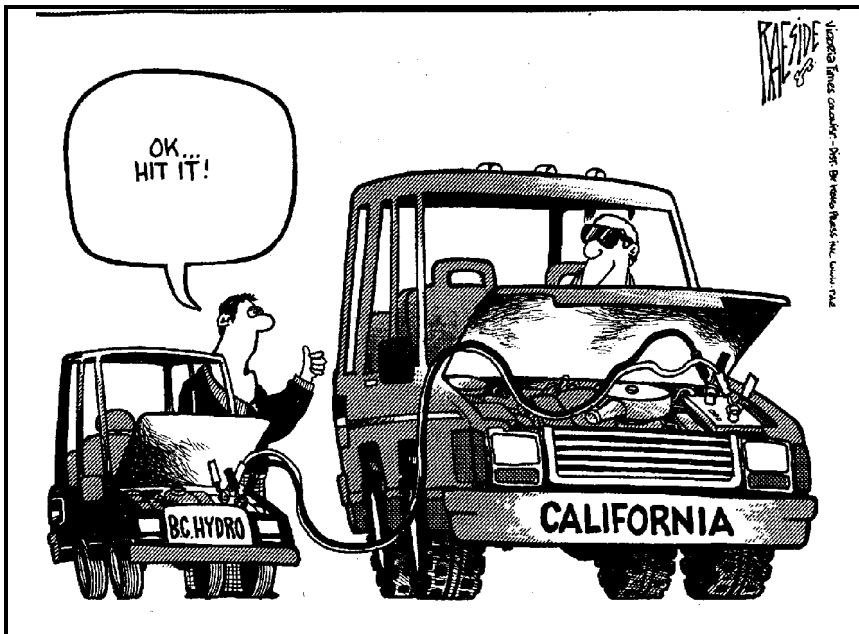


Figure1: BC Hydro is seen as a small supplier to California, *Victoria Times-Colonist*, 1 February, 2001, p. A10

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<sup>1</sup> 6 April, 2001, pA1.

1, *Victoria Times Colonist* editorial cartoon), if only because they're not paying their bills!

However, Bellingham is very much more the focus of critical energy issues and impacts. Pipeline safety issues, Cherry Point natural gas generation proposals, and impacts of the Georgia Pacific pulp-mill layoffs might show us how a small borderland city so far from California deals with a very-high level of "energy-induced" socio-economic stress. Not far away, the Canadian-US border has the Sumas "hub", described as the heart-pump of colossal underground steel arteries - the natural gas pipelines that move 2 billion cubic feet of gas down many hundreds of miles from Northern B.C. and into the United States.

Across the shared Lower Mainland Fraser Valley - Whatcom County borderlands, energy development *impacts* appear to have been a most significant near-term historical issue. Perhaps starting with the Ross Dam-Skagit Valley controversy of the early-1970's, through oil tanker traffic concerns, up to the most recent Sumas II and Cherry Point issues, our regional borderlands have shown an uneasy relationship with the generation or transmission of power.

However, *along* the borderlands farther to the east, the major developments of the past are pushing both BC and Washington into a new relationship - somewhat as victims of the California energy crisis. Residents - and politicians - of B.C. and Washington were both stunned last fall by the rising prices for energy. We have the resources in our province and state, so how come the shortages?

#### Linking Resources to Markets in the Pacific Northwest Regional Network

BC's hydrocarbon resources are mostly in the province's far northern region, in the Western Canada Sedimentary Basin (Fig. 2)<sup>2</sup>. There is also potential in the offshore waters around the Queen Charlotte Islands. Most important are the growing natural gas pipeline connexions,

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<sup>2</sup> 2000 *British Columbia Financial and Economic Review*, British Columbia, Ministry of Finance and Corporate Relations, Victoria, 2000, p. 20.

including the Alliance Pipeline and the Southern Crossing lines.

Hydro-power is split between dams in the Peace River region (37% of provincial hydro-electric generation capacity), Columbia region (47%), Vancouver Island (5%) and Lower Mainland/Coastal/Fraser regions (11%)<sup>3</sup>.

#### Integrating into Continental Energy Markets for Natural Gas and Electricity

While some electricity and natural gas had been exported through Washington earlier, B.C.'s electrical energy exports may have begun in earnest with the Columbia River Treaty, but only recently has a regulatory, economic and political infrastructure been established that more systematically integrates B.C. into a continental energy market structure - for both gas and electricity.

Early elements leading to this new structure included dismantlement of Canada's National Energy Program by the mid-1980's, followed closely by the move to Market Based procedures and natural gas deregulation in the National Energy Board, and the initiation of the Canada-US Free Trade Agreement in 1989 (Ryan, 1991). This turn-around of Canadian energy policies - from autarkic policies that caused a furor in the Western provinces (bumper stickers saying "Let the Eastern Bastards Freeze in the Dark" were probably some of the more polite epithets), to "continentalist" policies was a product of a Canadian Tory government in-tune with similarly-conservative British and American governments of Prime Minister Thatcher and President Reagan.

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<sup>3</sup> *Making the connection: the B.C. Hydro electric system*, B.C. Hydro, Vancouver, April, 2000, p. 11.

A continental-scale view (Figure 3) of the level of electricity exports and imports across the whole

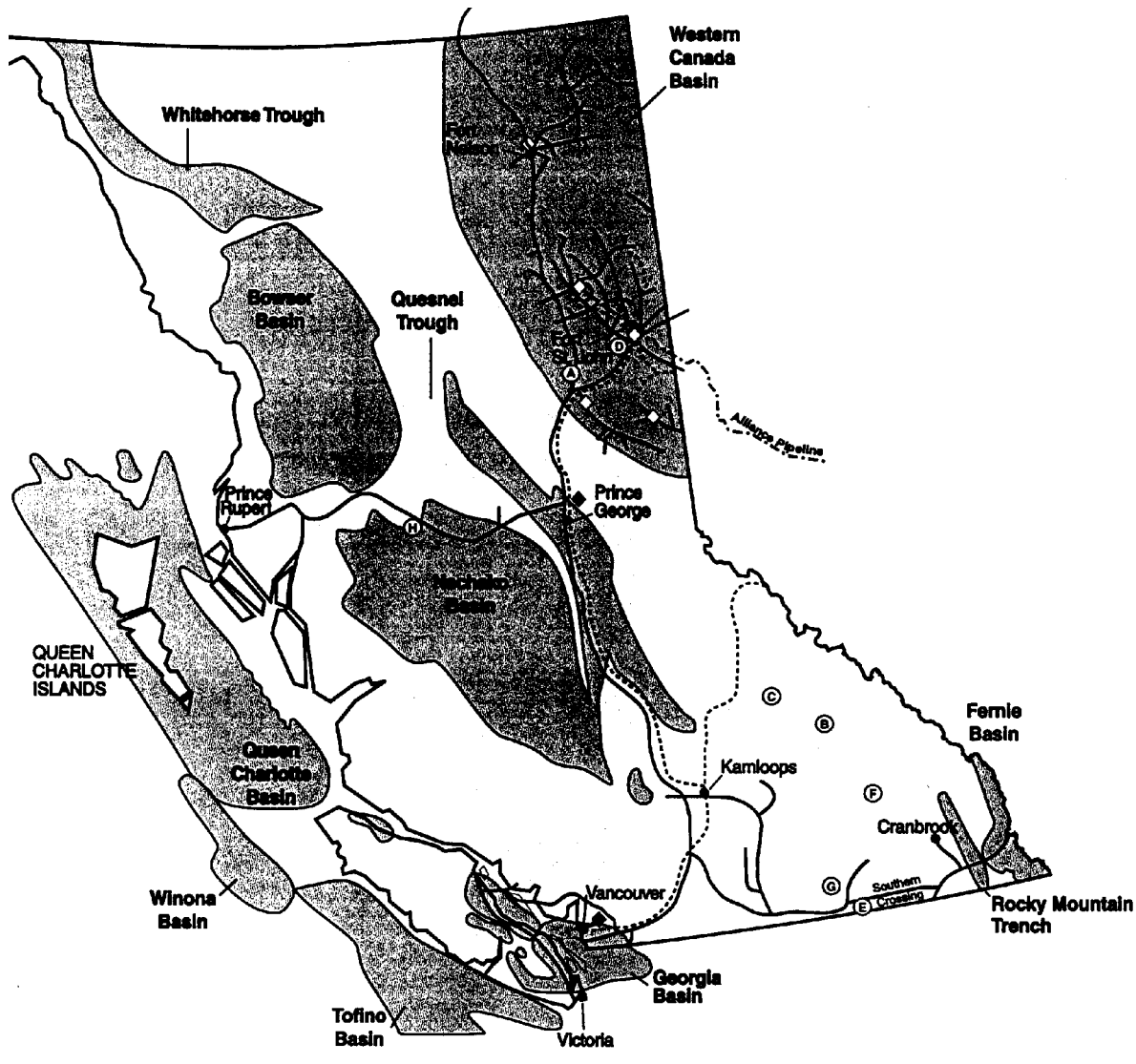


Figure 2. Provincial Pipeline Network and sedimentary basins. From *2000 BC Financial and Economic Review*.

Canada-US border reveals significant regional differences, with BC's being a heavy trader both ways, and more balanced than the export-driven trade of Manitoba or Quebec. Neighbouring Alberta's trade tiny in electricity, but extremely heavy in natural gas

David Sjoding, Deputy Director of Washington State University's Energy Program, has outlined Energy Price Increases and Energy Trends, noting that pre-NAFTA, Canadian natural gas



Figure 3 Canada-U.S. Electricity Trade, 1997. From *Canada 2000 Review*, IEA, 2000.

exporters had to satisfy our National Energy Board that there was a 20-year reserve. When NAFTA came into effect in the mid-1980s, with its key Chapter 6 provisions ensuring a free trade in all forms of energy, including electricity, this surplus was sold into the American market but is now gone. Major reasons that Sjoding gives for natural gas price increases also include the increased use of electrical generation with gas turbines, and more turbines to come, and more pipelines carrying Canadian gas to the Mid-West. He noted that the U.S. Energy Information Agency (EIA) had forecast 55% higher wellhead prices this winter over last - and increase pressure to drill in new areas.

He sees North West electricity as a continuing problem, with the BPA as an importer and the oddity of incredibly high June (2000) power prices, hitting \$1300 per megawatt hour (\$35-40 being normal). Sjoding concludes on an urgent note, seeing both environmental and economic logic in "end-user" solutions that include energy efficiency and renewable energy, aided by a price decline in renewables and further technology implementation strategies, and finally, demanding a

real and highly accountable industrial modernization.

In the early 1990's, the BC Utilities Commission - a provincial energy regulatory body, had moved toward wholesale competition, but by 1988, BC Hydro had already created its marketing subsidiary Powerex in order to buy and sell electricity. In 1996, BC Hydro was providing access to its transmission system for wholesale electricity "wheeling", whereby other Canadian and American power producers are sold reciprocal transmission privileges on B.C.'s electrical transmission grid. (IEA, 1996).

#### Spatial Organization of Electricity Trading Networks

The electricity network and the companies that are linked through the network in the Pacific North West form a regional transmission network, much of which has been proposed for membership of an official regional transmission organization (R.T.O.), as designated by the U.S Federal Energy Regulation Commission. William Massey, a FERC Commissioner, has outlined why FERC is motivated to build RTO's in a speech he gave in November, 2000.

To realize these benefits, RTOs must be truly regional in scope, large and well shaped. This summer's experience has demonstrated that electricity markets are inherently regional in nature. Prices throughout the western United States rose and fell with prices in California. This is a strong argument for a single Western-interconnection-wide RTO<sup>4</sup>.

At the continental scale, the North American Electric Reliability Organization includes all of Canada and the United States , and the continent has been divided into large regional organizations around the current trading technology. For example, British Columbia and Washington are members of the NorthWest OASIS (Open Access Same time Information System), as shown in Figure 4 below.

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<sup>4</sup>"Three Messages from Volatile Electric Markets", at the EBA Mid-Year 2000 Program, Washington, D.C. 17 November, 2000.

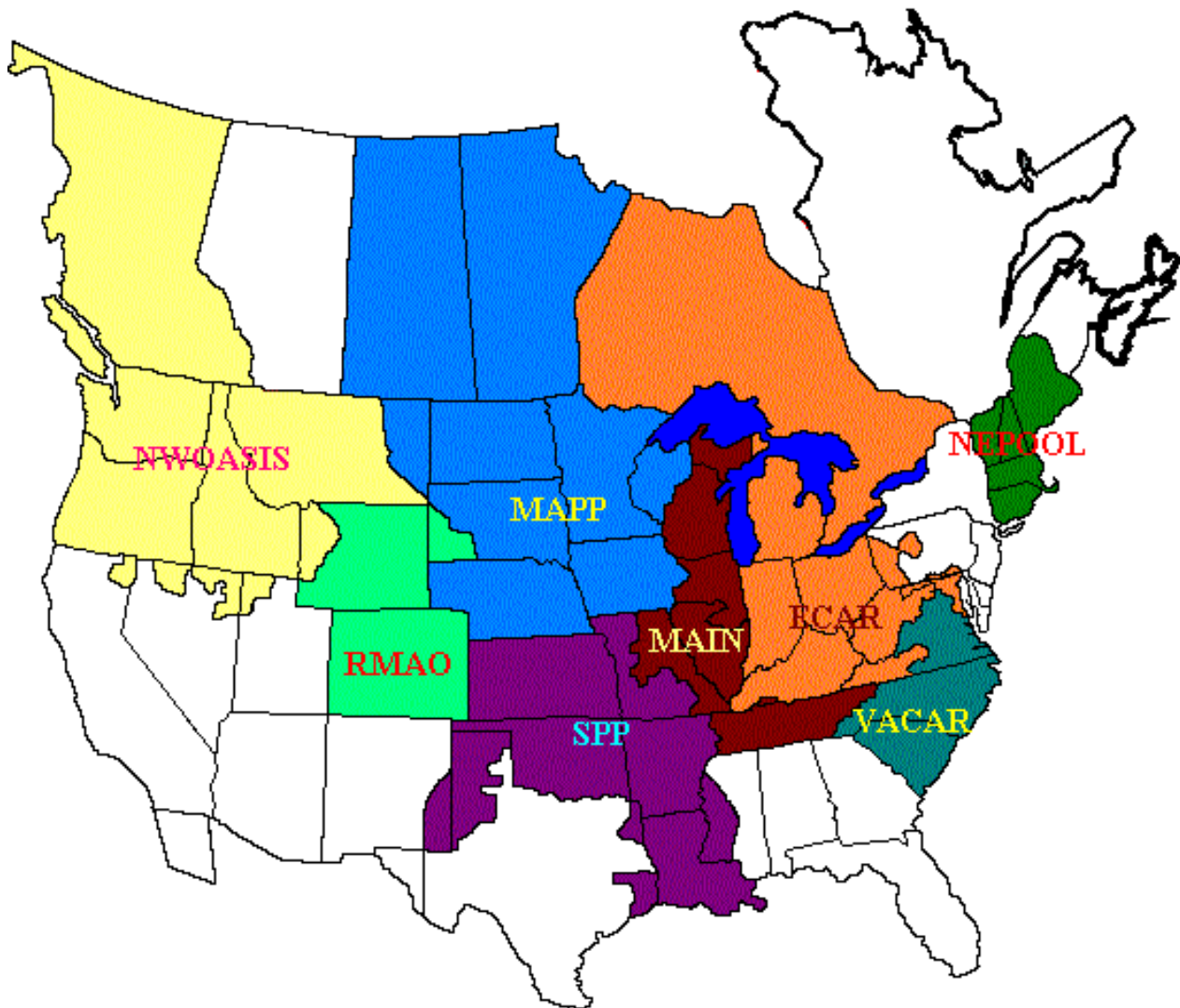


Figure 4 NAERO regional organizations

Powerex can not only trade electricity for B.C., but in 1997, was authorized by the American government to buy electricity in one US location for sale in another US location, and "became the first Canadian entity to sell electricity from Canada to Mexico" (Powerex, 2000). Accessing American electricity markets as an energy broker has meant that Powerex, BC Hydro, BCUC, and BC's Ministries of Employment and Investment and Energy, Mines and Petroleum, have become integrated as members of (and/or doing business with) several US-based regional electricity "Regional Transmission Groups" and organizations, including the Committee on Regional Electric Power Cooperation, Electric Reliability Council of Texas, Mid-Continent Area Power Pool, Northwest Power Pool, Northwest Regional Transmission Association, South-eastern Power Pool, Southwest Power Pool, Western Interstate Energy Board, Western Interconnection Coordination Forum, Western Regional Transmission Association, and the Western Systems Coordinating Council (WIBTP, Powerex, 2000). There are probably more - but this is becoming

true for energy utilities - both public and private - across Canada.

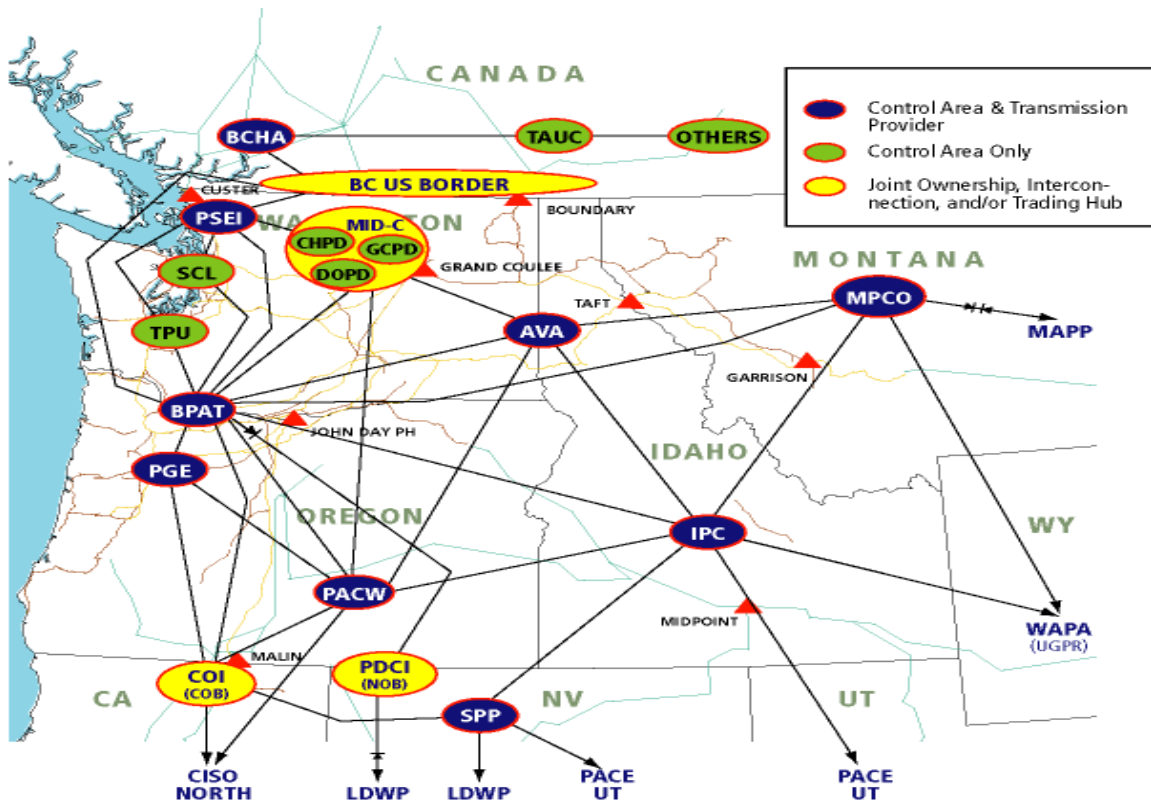
The convergence of energy-related policies (birth of FTA/NAFTA, NEB deregulation of



provincial power marketing, market-based), rising market prices for electricity and natural gas, and new technologies in power generation, such as natural gas electrical generation, have combined to signal distinct changes in B.C.'s energy sector.

Like Sjoding in January of 2001, John Reid, president of BC Gas, had expressed his concern

publicly in early December, 2000, that B.C.'s natural gas resources are becoming too expensive for home heating now that American power generators can bid up the price significantly and still



[Figure 5. Pacific Northwest electricity company’s flow paths in RTO West region](#)

be profitable (Reid, 2000). Reid’s speech had an alarmist quality as he noted that in December, 2000, Sumas “spot” electricity trading was running between \$290-400 USD (units not given), and at that level, he figured that natural gas-fired generators could pay up to \$28-39 USD - much higher than the \$2.28 paid a year earlier. Should natural gas prices go anywhere near this figure, it would be nothing short of catastrophic for both residential and industrial consumers.

While business analysts predictions for gas price movement are higher, none seems to come anywhere near Reid’s astronomical figures. However, even if he is proved wrong, his point of the *convergence* of natural gas and electricity generation seems to be echoed by many others in the field. That is, the highest value of natural gas will be for electricity generation and not residential

use.

The continental integration of energy supplies is being accompanied by the increasing integration of the private power companies as well - both generation capacity and company mergers.

Washingtonians may recall the acquisition of the Centralia coal-fired generator by Alberta's TransAlta company last May, while Canadian companies have been acquired by US companies, such as Calgary's Encal merger with Calpine.

## Conclusion

This is a critical time to understand how energy resources are changing - from local to global scales. Such research appears to have neglected for the last decade. Geographers such as John Chapman of UBC<sup>5</sup> have provided a definitive commercial geography of energy in 1989, but since then, there have been infrequent energy geography articles appearing in the journal *Geography*, initiated by Derek Spooner<sup>6</sup>. Neither Chapman's chapter on Canadian energy nor the 1996 *Geography* survey of the energy geography of the United States by Gregory Elmes of West Virginia University<sup>7</sup> were much interested in continental energy integration. Elmes did note that the US had "links" to Canadian and Mexican energy sources and markets, but it even five years ago, this rapidly-developing trend might not have been so evident. Historians such as David Nye and Thomas Hughes have been looking at the social and political development of electrical networks in North American and Europe and Hughes especially sees geographical perspectives as extremely important to understanding the expansion of electrical networks.

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<sup>5</sup>*Geography and energy : commercial energy systems and national policies*, Burnt Mill, Harlow, Essex, England : Longman Scientific & Technical; New York : J. Wiley, 1989.

<sup>6</sup>"Landscapes of Power: The Shaping of the UK's New Energy Geography", *Geography*, Vol. 84(1), pp 66-79.

<sup>7</sup>"The Changing Geography of Electric Energy In The United States", *Geography*, Vol. 81 (4), pp 347-360.

Certainly, the energy geography on the scale of North America do not seem to have had the revolutionary movement that Europe has seen, with the incredible changes in the United Kingdom (mass extinction of coal mines and the birth of North Sea gas), nor even in the recent explosion of windpower in Denmark that is now spreading across northern Europe. However, on the regional scale, there are some interesting developments. Windfarms in Walla Walla County appear innovative, but windfarm proposals for the oil patches of Alberta and Texas do seem downright revolutionary!

However, there is development and change on the scale of North America and as we struggle through the energy problems in the coming summer months, the energy landscape will be changing ever more rapidly. As the negative impacts of higher energy costs ripple through our communities, new groups will be joining the debate about the supply and management of energy resources. For example, the labour unions federation in British Columbia is challenging deregulation of natural gas and is raising its voice against deregulating of hydropower, while the AFL-CIO in Washington State is proposing stand-alone generation for aluminum smelters<sup>8</sup>. Our Council of Canadians is railing against the rush to “continentalize” Canadian energy resources.

New energy landscapes will emerge as the US and Canada secure Arctic gas flow production and transmission down one of two routes to the “Lower 48”. It will be an exciting time to trace the development and impacts of cross-border energy trade on borderland regions - and to see how the issues of Kyoto and global climate change politics work themselves out in the US, Canada and Europe.

I think that the border relationships between BC and Washington will be important to knitting together a more sustainable energy future. With the current lumber trade dispute, which Canadian newspapers insist on calling a “war”, our cross-border energy trade seems to be favoured by some Canadian commentators as the carrot to soften the will of American negotiators. However, our

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<sup>8</sup> “Unions Pursue Plan To Guarantee Low-Cost Power to Northwest Aluminum Smelters”, *The Spokesman-Review*, Spokane, Washington, 5 April, 2001.

Canadian Environment Minister David Anderson rejected a similar call from the European Union's Kyoto Accord negotiator to "play the energy card" in order to get the Americans on side. Anderson said, "There are all sorts of people who think we should use the energy card -- to play it on Prince Edward Island potatoes, to play it on softwood lumber, to play it on Alberta beef ..." I guess that must be the hope of some Canadians who publicly revile the notion that Canada should export water to the US, but know that if we did, they could use it as leverage for whatever ails their exports.

The developments in Washington State pushing toward both new projects- wind-farms<sup>9</sup>, gas turbines<sup>10</sup>, and the proposed increases in nuclear power<sup>11</sup>, give us in British Columbia lots to ponder. Certainly, our monolithic BC Hydro seems to be willing to enter into major new commitments to sustainable energy issues, but as a provincial election looms over the horizon, its future is rather murky. It is an exciting time to be looking at the geography of energy.

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<sup>9</sup>"Wind farm to be built near Tri-Cities will be largest ever", Gillian Flaccus, *Associated Press*, 11 January, 2001.

<sup>10</sup>"Three Eastern Washington power plants proposed", *Journal of Business*, Spokane, 22 March, 2001.

<sup>11</sup>"Nuclear power back on the agenda", *Puget Sound Business Journal*, Seattle, 2 April, 2001.