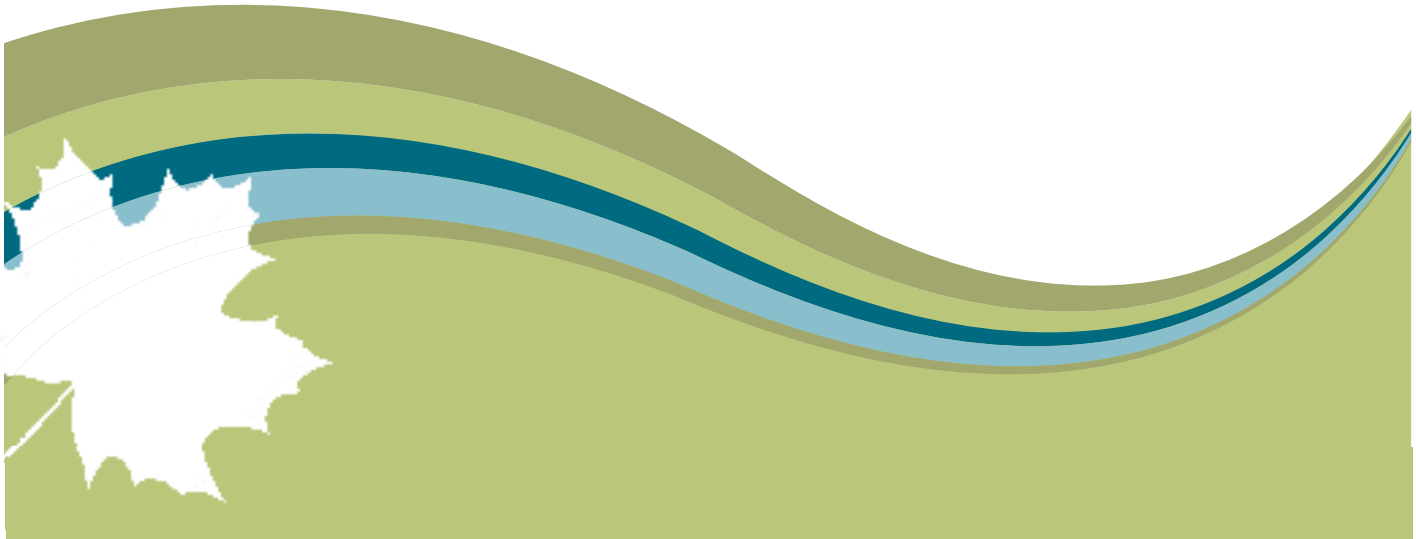

RESEARCH PAPER

The Canada-U.S. Trade, Energy, and Emissions Relationship

By David McLaughlin, President and CEO, National Round Table on the Environment and the Economy

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Introduction

This paper provides background information and context for discussion at the meeting entitled "Towards a National Clean Energy Strategy" in Banff, Alberta, from April 8th to April 10th, 2010.

Much of Canadian wealth and well-being is attributable to its success as a trading nation, and in particular, trade with the United States. The characteristics of the two economies and the trade flows between them provide important context for discussions on developing a national clean energy strategy for Canada. The Clean Energy Dialogue embarked upon by Canada and the United States testifies to this importance. On the one hand, because of the high level of trade integration between the two countries, climate and energy policy choices in the U.S. have both economic and environmental implications for Canada. Differences in policies can lead to competitive advantages for firms in one country. On the other hand, Canada and the U.S. have different energy sources, emissions profiles, forecasted rates of emissions growth, and costs of reducing emissions. While there are obvious complementary elements, crafting a Canadian clean energy strategy that seeks to integrate economic, environmental, social and regional factors suggests that a uniquely Canadian policy approach – complementary but different – could best meet our needs.

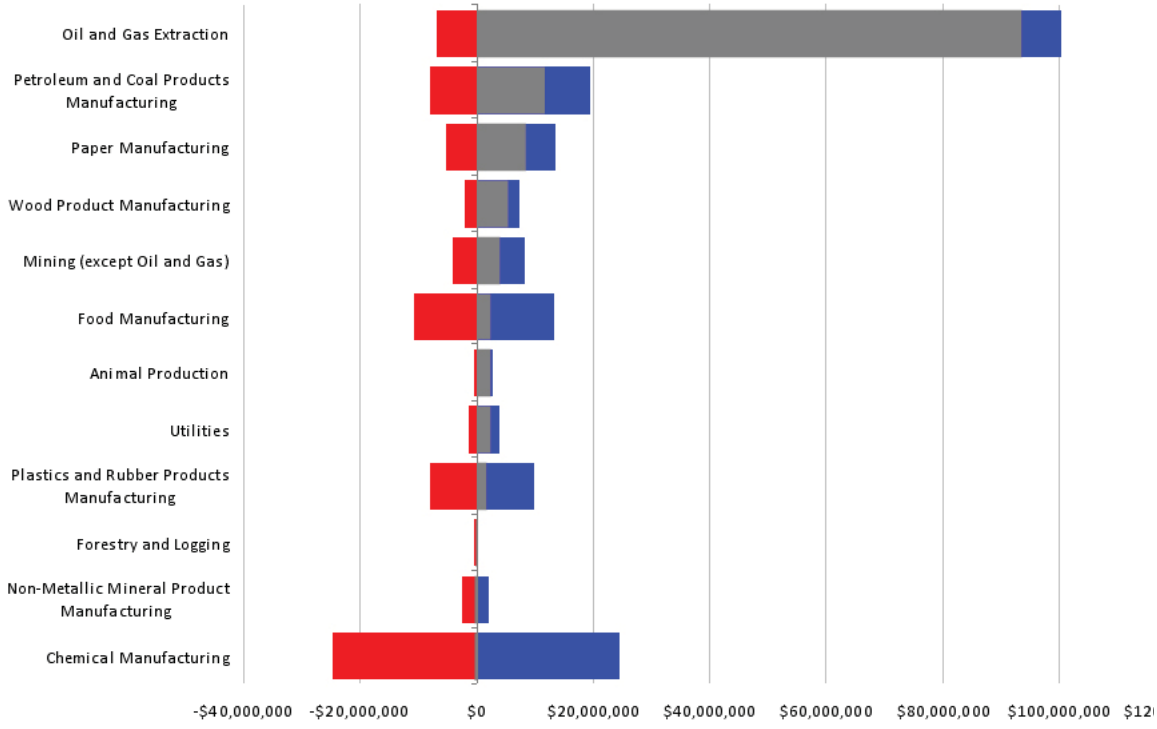
The Canada-U.S. Trade and Energy Relationship

The U.S. is the largest market for Canadian exports, and the largest single source of Canadian imports. In 2008, over 77% of Canadian exports were destined for U.S. markets. The U.S. is the primary destination for Canada's largest exporting sectors, including our energy and agricultural sectors. The U.S. accounts for around 65% of Canadian imports with the leading sectors being automobile manufacturing and parts, followed by the aerospace industry and the oil and gas sector.

1 This paper was prepared by the NRTEE Secretariat as a specific contribution to the Banff dialogue and does not represent formal approved policy advice by NRTEE members nor does it necessarily represent the views of the organizations with which they are affiliated.

The chart below depicts the exports, imports, and trade balance between Canada and the U.S. by sector.

Figure 1 Canada/U.S. Trade Surpluses for Select industrial sectors for 2008 (Billions of CAD$)



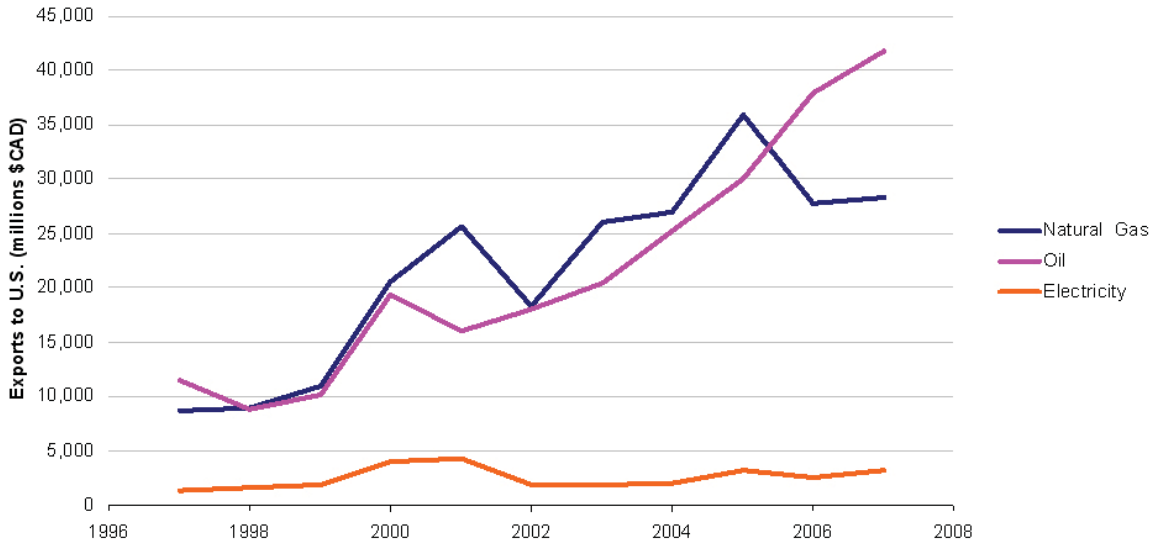
Note: Oil and gas imports to Canada are primarily from OPEC, but enter Canada from the U.S. via the Maine pipeline.
Source: Statistics Canada

In 2008, Canada had major trade surpluses with the U.S. in oil and gas extraction, petroleum and coal products manufacturing, paper manufacturing, and wood product manufacturing. Canada's exports to the U.S. are significantly less diverse than U.S. exports to Canada. The oil and gas industry is now the largest source of Canadian exports to the U.S., after nearly doubling in value over the last five years. The automobile manufacturing sector is a distant second. As recently as 2004, however, the reverse was the case, with some $56 billion in automobile exports to the U.S. compared to $52 billion in oil and gas exports. The value of automobile exports steadily declined in recent years, dropping approximately 35% to its current level of around $36 billion, re-inforcing the central importance of energy trade to Canada's economic wealth.

The Canada-U.S. Energy Relationship

The value of Canadian energy exports to the U.S. has grown substantially in the past decade. Oil exports now total more than $40 billion a year while natural gas exports are more than $28 billion a year. As shown in Figure 2 below, this growth is primarily due to an increase in oil and natural gas exports (and rising prices for these commodities). Revenues from electricity exports have, by contrast, remained relatively flat over the same period, in the range of $1-4 billion per year.

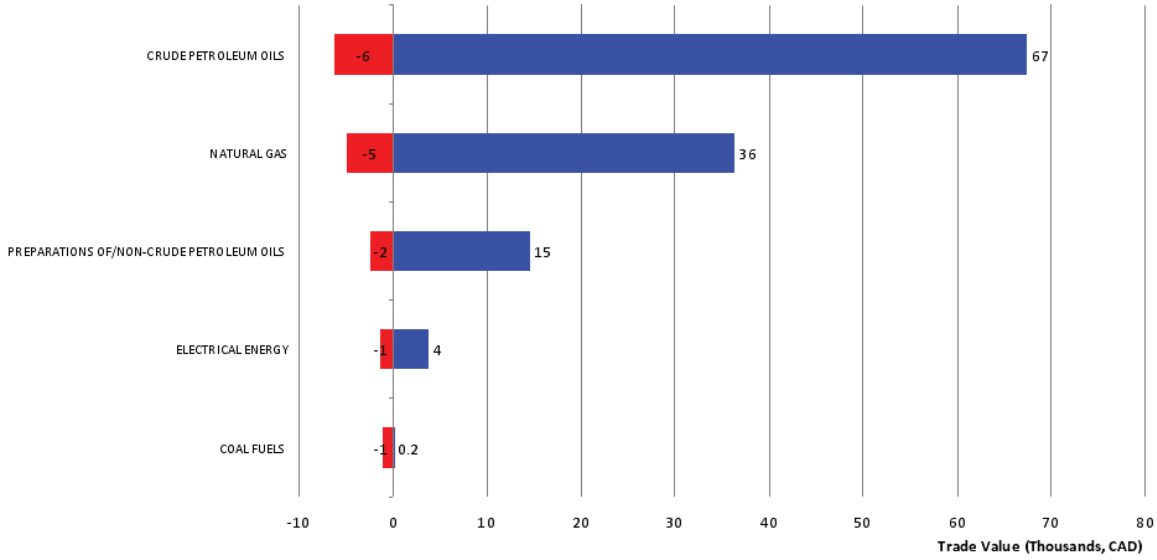
Figure 2 Exports of Oil, Natural Gas and Electricity to the U.S., millions of CAD$



Source: Statistics Canada

Canada's overall trade balance with the U.S. in energy commodities is positive for all fuels except for coal, as illustrated in Figure 3. Canada imports more coal from the U.S. than it exports, despite the fact that its overall trade balance with the rest of the world in that commodity is positive. By far the most significant trade surplus from energy trade for Canada comes from exports of petroleum products.

Figure 3 Overall Energy Trade Balance with U.S., 2008 (Billions of CAD$)



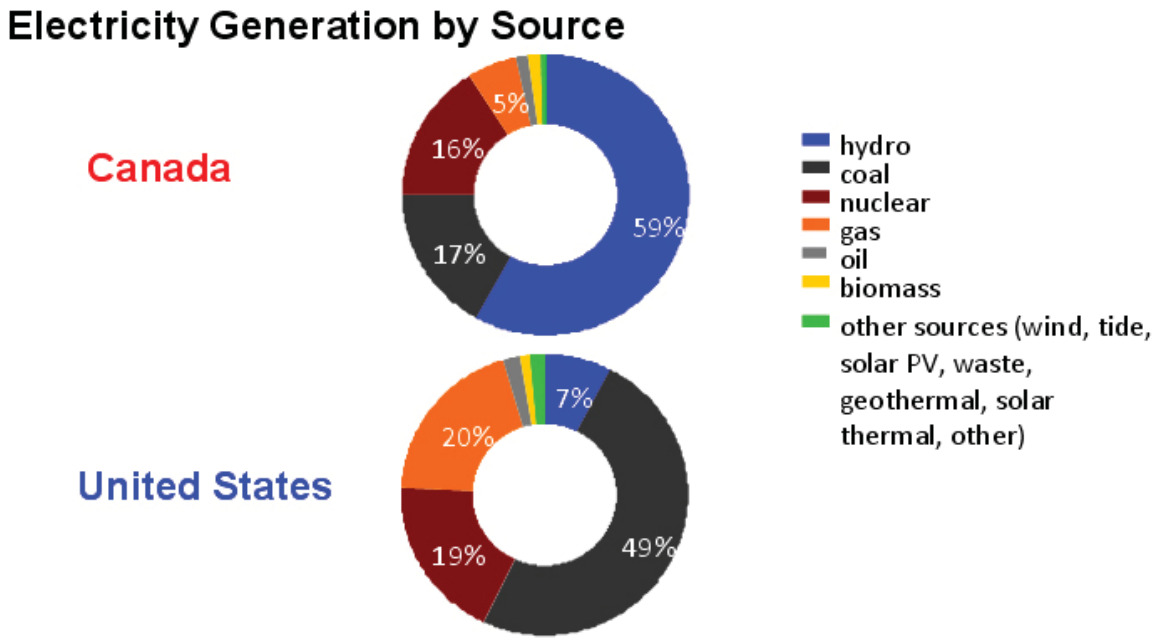
Source: Statistics Canada

One key difference between the energy systems of Canada and the U.S. lies in the different composition of energy sources used for electricity generation. As indicated in Figure 4, the majority of electricity generated in Canada came from hydroelectricity. Canada is the world's second largest producer of hydroelectricity, following China. This abundance of hydropower means that Canada is much less dependent on coal-fired power plants for electricity than many countries – the U.S. included. In the U.S., significantly more electricity comes from coal compared with Canada. The U.S. also uses more natural gas for electricity generation than Canada.

However, this abundance of hydropower does not necessarily translate into a common advantage across regions in Canada. In Ontario, for example, the provincial government maintains that it will close its four coal-fired plants (Atikokan, Lambton, Nonticoke, and Thunder Bay) by December 31, 2014, citing environmental and health concerns. The government plans to replace coal-fired capacity with natural gas, nuclear, hydroelectricity, and wind, along with increased conservation measures. At present, coal provides about 16 percent of Ontario's electric power. In the National Energy Board's 2009 reference case, the retirement of Ontario's coal-fired facilities is offset by increases elsewhere in the country—notably, Alberta and Nova Scotia. As a result, Canada's coal-fired generation rises modestly, from about 106 billion kilowatt hours in 2006 to 128 billion kilowatt hours in 2030.

These differences have obvious implications for any clean energy strategy. On the one hand, the U.S. can achieve very large emissions reductions by replacing its coal-fired electricity plants with less carbon-intensive alternatives, while Canada requires a broader range of measures across multiple sectors to reduce emissions. On the other hand, electrification in Canada provides greater emissions reductions due to Canada's lower emissions-intensity of electricity generation. In the short-term, Canada's low-carbon generation provides it with a potential longer-term competitive advantage if both Canada and the U.S. implement climate policy that puts similar prices and stringency on carbon emissions.

Figure 4 Share of Total Electricity Generation by Source for Canada and the U.S. (2006)



Source: International Energy Agency

The Canada-U.S. Climate Relationship

The federal government has recently indicated its intention to harmonize Canadian climate policy with the United States, increasingly on all elements. This has implications for both the ambition and pace of climate policy development and implementation here in Canada. Already, GHG targets have been moderated to line up with proposed U.S. targets. The table below compares recent and current Canadian GHG emissions reduction targets with the United States for 2020.

Table 1: Comparison of Canadian and American GHG reduction targets for 2020

Target 2020	U.S. (Waxman-Markey)	Canada (*Turning the Corner*)	Canada (January 2010)
Relative to 2005	17% below 2005	21% below 2005	17% below 2005
Relative to 2006	16% below 2006	20% below 2006	16% below 2006
Relative to 1990	3% below 1990	3% below 1990	3% above 1990

Yet, U.S. ambition and timing on the climate file remains unclear and uncertain. Early momentum in Congress with the Waxman-Markey bill, together with various Senate bills, has stalled. A federally-mandated cap-and-trade system that could prospectively link with Canada remains in limbo. Tailpipe emission standards harmonization has made some progress but is incomplete. Clean energy technology discussions have not yielded specific results. So, what "harmonized" Canadian-American climate policy actually will look like is not yet settled.

An inevitable question for Canada will be whether and how it 'does something' on climate policy while the U.S. 'does nothing', if delays persist south of the border. Previous NRTEE reports (*Getting to 2050* (2008); *Achieving 2050* (2009)) demonstrate that an early, economy-wide carbon price signal is the most cost-effective means of meeting deep GHG emission reduction targets. Delay is costly as the carbon price will have to rise to meet stated targets in a shorter time frame. Like all countries, Canada will seek to implement policies that achieve the most GHG reductions at the least economic cost. A core issue for the development of a clean energy strategy for Canada will therefore be to what extent it contemplates taking action on related climate policy objectives now or only at a later date, pending U.S. action.

For Canada, there are both risks and opportunities of U.S. climate policy and its impact on Canadian energy and climate policies. Figure 5, developed by the NRTEE, offers a way to illustrate the types of trade-off risks at play from both an economic and environmental perspective in contemplating various leading, lagging, or harmonizing scenarios for Canada. They include competitive sectoral impacts, regional distribution impacts, application of border carbon adjustments, and missing both medium-term (2020) and longer-term (2050) targets. It offers a way to contemplate optimal Canadian policy design to minimize risks. No option is risk-free – including harmonization - and there are inescapable costs to all. The table is illustrative only at this stage; Canadian policy choices and responses will ultimately determine the likely level of risk.

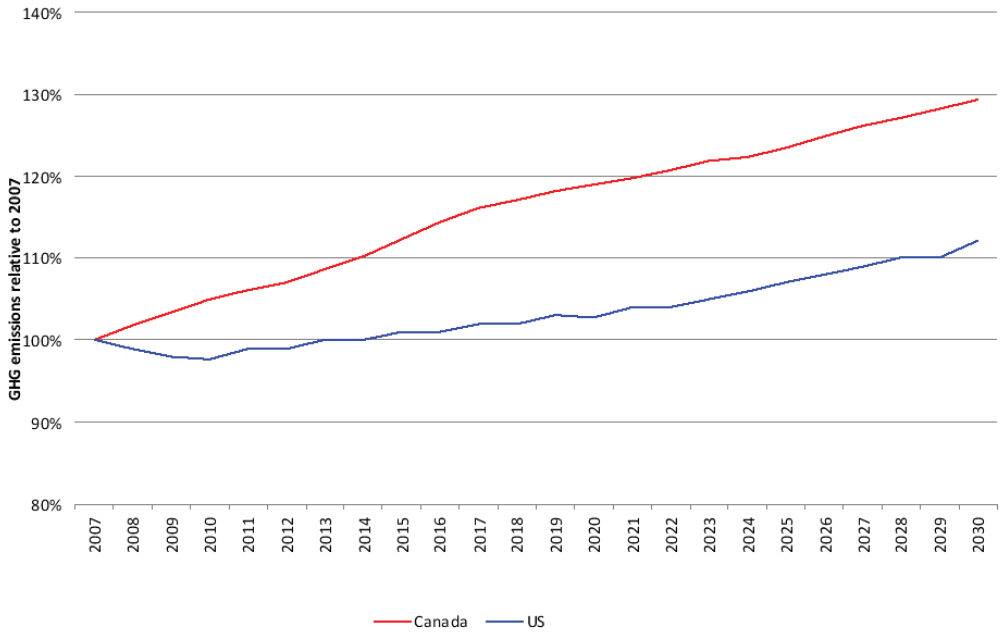
Figure 5: Illustrative risks for Canada of Leading, Lagging, and Harmonizing with U.S. policy

	Competitiveness	Regional impacts	Border carbon adjustments	Missing targets	Long-term GHG reductions
Lead	Moderate	Moderate	None	None	None
Lag	Less	None	Moderate	Higher	Higher
Harmonize on Targets	Less	Moderate	Less	None	None
Harmonize on Price	Less	Less	None	Less	Less
	Economic			Environmental	

A core reason for these underlying risks lies in the expected rate of growth of future GHG emissions for the two countries. This difference is reflected in Figure 6, which shows the percent increase in GHG emissions over 2007 levels as predicted by current business-as-usual projections for Canada and the U.S. Canada's emissions in 2006 were 22% above 1990 levels while the U.S. stands at 15% above 1990 levels.

2 Note that the projections for Canada were completed before the full onset of the current global economic downturn in 2008, and therefore do not take into account a decrease from the decline in economic activity as do the U.S. projections.

Figure 6 U.S. and Canada GHG Projections, 2007 – 2030 (2007 = 100%)



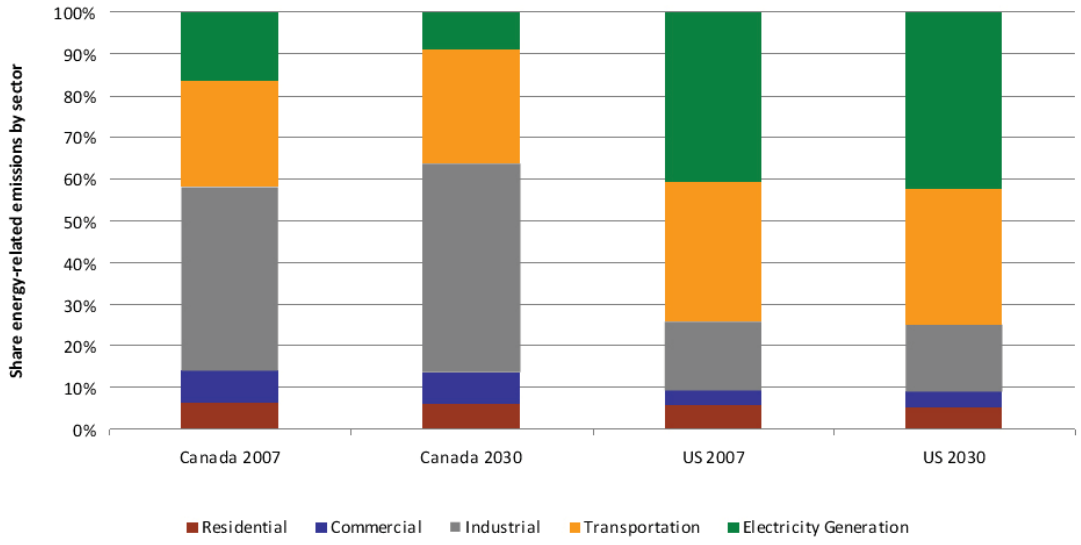
Source: National Energy Board, Canada's Energy Future – Reference Case & Scenarios to 2030; U.S. Energy Information Agency, Annual Energy Outlook 2009 – Reference Case

Higher emissions growth in Canada is principally a result of the forecasted continued growth of the Alberta oil-sands. Oil production (including oil sands) in Alberta relies primarily on electricity generated from coal. As oil sands production is electricity-intensive, this translates into greater overall emissions growth in Canada, implying a greater level of effort (and likely higher carbon prices) to reduce emissions and meet the newly stated targets for Canada, than will be required in the United States. This means a higher marginal abatement cost curve for Canada, although the exact shape between now and 2020 will depend on whether Canadian policy seeks to align only on quantity (targets), or on price, as a forthcoming NRTEE policy advisory report will illustrate.

From a sector-level perspective, two distinct differences between the countries emerge. First, Canada's access to hydroelectric generation – as discussed above – greatly diminishes emissions from the electricity generation sector in Canada, relative to the U.S. Second, Canada's industrial emissions account for a much higher share of overall GHG emissions than do industrial emissions in the U.S. Partly this difference is indicative of relatively fewer emissions from electricity generation in Canada, but it also reflects the emissions-intensity of Canada's economy, particularly the mining and oil and gas extraction

sectors. Industrial emissions have shown strong growth in the past decade in Canada and are predicted to continue to grow in relative importance. As reflected in Figure 7, by 2030, emissions from industry are forecast to account for nearly 50% of total GHG emissions in Canada – compared to around 15% in the U.S. This growth in the Canadian industrial sector is important in the context of Canadian and U.S. climate and energy policy as highly traded and emissions intensive sectors (e.g. cement, aluminum) could face the greatest economic impacts from Canadian and U.S. climate policy.

Figure 7: Share of Energy-Related GHG Emissions by Sector for Canada and the U.S., 2007 and 2030



Source: National Energy Board, Canada's Energy Future – Reference Case & Scenarios to 2030; U.S. Energy Information Agency, Annual Energy Outlook 2009

Conclusions

Key messages emerge from the emissions, energy, and trade context presented in this paper. First, Canada's trade relationship with the U.S. is vital for Canada's continued wealth and prosperity. Driving this is Canada's energy economy and valuable exports of oil, gas, and electricity products and services to the United States. Extensive trade, particularly in energy, highlights the integrated nature of the Canadian and U.S. economies. As a result of these close trade ties, impacts of climate and energy policy in the U.S., and Canada's response to it, will have clear cascade effects in Canada.

Second, differences between our two energy economies have significant implications for Canada's ability to achieve the same GHG emissions reduction targets as the United States to which we are now committed. Because Canada's emissions are growing at a faster rate than in the U.S., Canada will have to make a greater relative level of effort in reducing emissions. This reality will impact Canada's future competitiveness and the growing contribution of our energy sector to national economic wealth and Canadians' standard of living.

Third, a national clean energy strategy and a national climate policy are clearly linked. Steps now to begin to align the two more deliberately will reap benefits over time in making inevitable GHG emission reductions more cost-effective and achievable.