



Introduction To, and Impacts Of, the Kyoto Protocol On Saskatchewan, Canada, and the World

Prepared by the Saskatoon and District Chamber of Commerce, July 2003

Introduction

“The cost to the Canadian economy in implementing the proposed reductions in greenhouse gas emissions is estimated to vary between \$24 billion and \$37 billion a year on an ongoing basis for many years.”¹

“If the Kyoto Protocol is not implemented, costal cities like Vancouver and New York will be just like Atlantis: lost to the sea.”

These are some of the claims made surrounding the Kyoto Protocol. It is a subject of great controversy. There are overriding questions being asked including what is more important: the environment or the economy? In addition to global questions, more specific questions are being asked. Will Kyoto bring economic opportunity or despair? Is it possible to reach the targets established in the Protocol within the period defined in the agreement?

There is an abundance of information, all of which seems to be “pitching” one side of the argument. Neutral studies on the impact of the Protocol are few and far between. Even when one report seems to be neutral, there are often political agendas attached.

The issues surrounding the Kyoto Protocol are not new. They have been around since December 1997 when 38 developed nations agreed, in principle, to reduce their emissions relative to 1990 levels. So why is it becoming an increasingly important issue now? The Prime Minister has stated he will ask Parliament to vote on ratification by the end of 2002.

The following will provide a very general introduction to the Kyoto Protocol, as well as the potential benefits and consequences attached to its ratification.

¹ Roger Phillips, Ipsco, Chamber of Commerce luncheon, 1998.

Kyoto Protocol Explained

On December 11, 1997, the Kyoto Protocol was completed. It was composed of 28 articles with the end goal being a reduction of greenhouse emissions to improve the global climate.

The Kyoto Protocol established greenhouse gas emission targets for participating nations, all as a percentage of emission levels in 1990. For example, Austria was required to reach an emissions level of 92% of 1990 levels by the 2008 to 2012 commitment period. Canada was charged with reaching a level of 94% while the United States were required to reach a level of 93%.

In order to reach the targets established, countries were encouraged to further develop national policies, specifically in the areas of energy efficient technologies, renewable sources of energy, promotion of sustainable forest management practices, and the reduction of fiscal incentives in greenhouse gas emitting sectors of the economy.

In addition to emission reduction by using alternative energy production methods, countries will also be given “credits” based on other environmental factors. For example, Canada could receive credits for reforestation efforts.

The credits will only be provided if the initiative is human-induced, rather than naturally occurring. For example, if a forest grows, thereby increasing its capacity to contain carbon, no credit would be given. However, if an area is reforested, credits would be provided to aid in reaching the Kyoto Protocol targets.

Before the Kyoto Protocol becomes legally binding, 55% of participating groups producing 55% of emissions must ratify the agreement. This puts larger countries, such as the United States, in a position to partially block the approval of the agreement without pulling out completely.

Carbon Dioxide Presents a Unique Challenge

Canada has always prided itself as a world leader in air pollution control and technology. On the federal, provincial, and municipal levels, Canada has helped pioneer technologies, initiatives, and policies that help control and reduce air pollutants. The challenge that is faced with Carbon Dioxide is that it is, in fact, not considered to be a pollutant.

CO₂ is produced as a result of the combustion process. To date, no technology exists that can take CO₂ out of the process. As a result, most of the energy production methods we have today result in the release of large quantities of CO₂. The burning of coal is one of the most damaging forms of energy production, as it releases far more than just CO₂. Oil and natural gas follow behind coal as the three fuels that produce the largest quantities of CO₂ per unit of energy.

It is important to note that CO₂ does not cause smog, nor does it cause respiratory problems like other pollutants. Therefore, controlling CO₂ emissions will not help reduce smog in Los Angeles or Toronto, and it will not affect the severity of asthma in children or the elderly. The pollutants that cause these problems are often associated with the same processes as the emission of CO₂. By operating motor vehicles, for example, CO₂ is released, as are a number of other substances.

In order to prevent smog and respiratory problems, CO₂ controls are not the tools to be used. Other measures, such as the acceleration of hydrogen fuel cells in transportation, should be considered.

While there are prospects for the hydrogen fuel cell, technology that results in water being produced from the combustion process, before the fuel cell can function we must separate the hydrogen from other atoms. In order to separate these molecules, energy must be used. If coal, oil, or natural gas are used to produce the electricity needed, we are no better off than had we used current fuel types to produce energy. This issue is explored in greater detail further in this document.

International Situations

A frequent criticism from many groups, and the reason some countries are refusing to ratify the agreement, is the lack of inclusion of large, developing markets. China, Mexico, and Brazil are three countries that produce a significant portion of the world emissions due to their reliance on coal power plants and dense manufacturing sectors. These three countries do not have any reduction commitments for the first commitment period (prior to 2012). In total, there are 135 countries that do not have reduction commitments.

The criticism also comes because the financial cost of reaching the targets of the Kyoto Protocol would put companies at a competitive disadvantage. A company with manufacturing operations in Canada may be forced to invest in new technologies, or purchase emissions permits, in order to continue to operate. If that same company was operating in Mexico, there would be no cost associated with compliance. What would likely result, in particular in the United States, is a shift of jobs to other countries, such as Mexico, where the Kyoto Protocol was not ratified.

North American Situation

The North American Free Trade Agreement, NAFTA, is composed of the three countries that make up North America: Canada, the United States, and Mexico. NAFTA promotes free trade amongst these three countries. While all three countries were involved in the development of the Kyoto Protocol, there are substantial differences in the implications that this agreement has on their regions and decisions.

Mexico does not have any stated emissions reduction commitments. In addition, Mexico also offers reduced labour costs than do Canada and the United States. With no emissions targets, Mexico will be able to continue in high-polluting industries with no economic sanctions being placed on businesses operating in that country. Meanwhile, companies operating in regions that do ratify the Kyoto Protocol will be forced to purchase emissions permits (explained in further detail later in this document), which increase the cost of production. This leads us to draw the conclusion that firms operating in manufacturing industries will likely examine relocation to Mexico in order to access a less expensive labour force while avoiding the additional cost of emissions permits.

Mexico alone does not pose as significant a threat as does the second element that will greatly hamper the ability of Canada to compete internationally. The United States has announced that it will not ratify the Kyoto Protocol and will instead implement its own climate change strategy. Since the U.S. emits approximately 25% of the world's greenhouse gas, Canada would once again be placed at a disadvantage.

Canadian businesses will be faced with costly regulations and expensive restrictions on industrial activity. Since the United States will not ratify the Protocol and Mexico has no target levels of emissions, Canada will be in a vulnerable position relative to two of its most important trading partners.

With these challenges also come opportunities. Without their participation, the U.S. economy will likely grow at a rate that is significantly higher than the rate of Canadian growth. This could result in an increase in exports from Canada to the U.S. to support their economic expansion. Canadian commodity producers may be presented with some unique opportunities to grow their business through exports to the U.S.

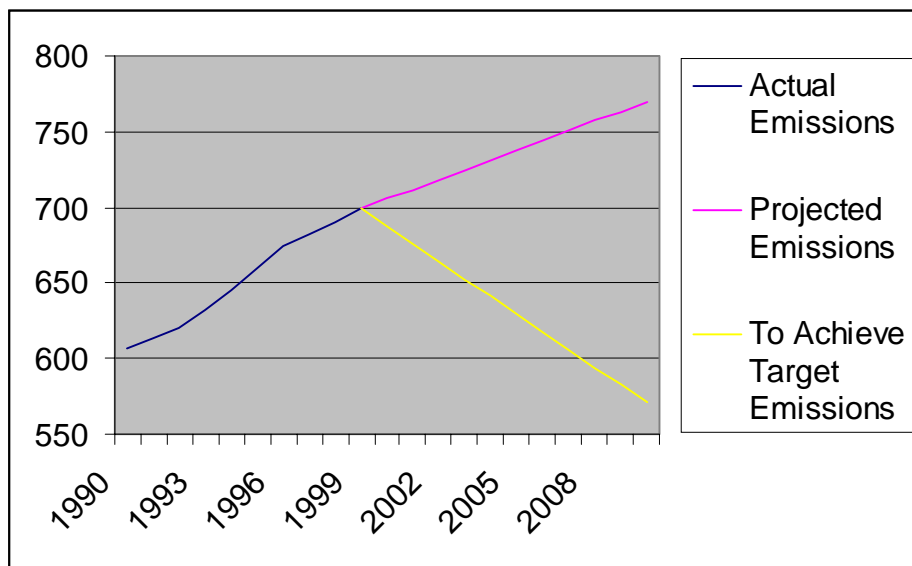
Examining the situation from another side, the lack of U.S. participation will undoubtedly result in lower "emission permits" prices. As Canada is projected to be an overall purchaser of permits, a lower price would benefit Canadian companies, especially those in energy-intensive industries. Do not forget that Canada would remain in a disadvantaged position relative to the United States. Emission permit trading is explained in further detail later in this document.

Canadian Impact

While the global economic impact can be examined if a broad perspective is desired, it is beneficial to examine individual countries that will be affected by the ratification of the Kyoto Protocol.

In order to meet the targets of the Kyoto Protocol, Canada would have to reduce emissions by 6% below 1990 levels. Currently, Canada produces 2% of the world total greenhouse gas. The United States produces 25% of the world total.

In 1990, emissions in Canada were 607 Mt. The target level is set at 571 Mt. A graph, shown below, projects emission levels from 1999 out to 2010 without new emission-reducing efforts, and also shows the trend required to achieve the Kyoto targets.



Source: "Canada's Greenhouse Gas Emissions, 1990-1999" Environment Canada

The above graph shows the dramatic change that is required to reach the goals of the Kyoto Protocol. Canada would have to reduce greenhouse gas emissions by 128 Mt from 1999 levels. In order to achieve this reduction, and assuming no technological improvements, all of the following types of vehicles would have to be removed from the road with no alternative form of fuel-burning transportation being used:

- Gasoline Cars
- Light Duty Gasoline Trucks
- Heavy Duty Gasoline Trucks
- Diesel Cars
- Light Duty Diesel Trucks
- Heavy Duty Diesel Trucks

Again, using 1999 data, eliminating all emissions from electricity and heat production, as well as from fuel combustion in mining, would still fall short of the Kyoto targets.

There is significant domestic and international pressure on Canada to ratify the agreement. Canada was once considered the champion of environmental protection and aggressively pursued new environmental technologies. Now, Canada is losing favor internationally because the country is seen to be “dragging its heels” on the issue.

To place the Kyoto Protocol in terms that show the immediate impact that its ratification will have, let us consider the effects on the ordinary consumer in Canada. As Canada is a large country with lower average temperatures, its citizens are heavily reliant on personal transportation and residential energy use. Cold winters result in individuals needing to heat their homes. Great distances between major centres, as is the case in Western Canada, causes personal transportation to be very important. Canadians, in order to reach the targets of the Protocol, will be required to dramatically alter their consumption of energy and alter their transportation patterns.

It is estimated that the price of gasoline could increase by more than 30 cents per litre, taking the price in most Canadian jurisdictions well over \$1.00. Electricity and heating costs are expected to rise considerably, even if the source of electricity is hydro. The integration of electricity grids in Canada will contribute to this upward trend of prices.

"Developing Nations" such as Mexico have infrastructure that allows them to compete effectively with Canada. With the introduction of another layer of regulation and fees occurs in Canada, companies will seek to establish operations in other regions. The bulk of this loss will come from the above-average pay employees of the manufacturing sector who will find themselves relocating or being unemployed.

The Government of Canada will be forced to invest in enforcement mechanisms to ensure targets will be met, as well as investment in unemployment programs to ensure that those who lose their jobs due to firm relocation are not left out in the cold. Estimates in cost to the Government begin at \$500 million. Some Government officials believe these numbers to be far below actual costs that will be incurred. Canada will experience GDP losses of 1.9% per year, resulting in close to \$30 billion by 2010. The total cost over the next 8 years, including lost GDP and government spending, could easily exceed \$40 billion.

Canada would be out \$40 billion, have a constricting economy, have a higher unemployment rate, all accompanied by a reduced standard of living as the cost of living increases dramatically.

The Government of Canada itself, in estimates agreed to by the Prime Minister's Office, the Privy Council Office, the Environment Department, and the Natural Resources Department, it is thought that implementing the Kyoto Protocol will cost Canada around 200,000 jobs and up to 1.5% in lost economic growth by 2010.

The situation is perhaps best demonstrated by Edco Financial Holdings Ltd, a company that controls major oil and gas projects in Canada. The company currently has \$8 billion worth of oil extraction and processing that occurs in Canada. However, only \$4 billion is

as a result of extraction, the only portion of the process that must be performed in Canada. The remaining \$4 billion could easily be moved to the United States where the cost of processing would be substantially cheaper to perform, as there would be no costs associated with permits and regulations.

By losing \$4 billion in investment, the Canadian economy would be damaged. Consider that there are multiple Edco Financial Holdings in Canada, all of whom could reasonably make the same choice. The impact stretches far beyond the oil and gas sector. Many other industries, particularly those that are highly involved in manufacturing and processing, will be facing similar decisions and must consider relocation as the cost of doing business rises.

Saskatchewan

In Saskatchewan, to eliminate a large portion of GHG emissions, SaskPower would be required to end the use of coal and gas in the production of energy. In 2001, coal and gas combined to produce 67% of the energy generated by SaskPower, with 63% being generated through the burning of coal. In 2001, SaskPower spent \$468 million on fuel. Of this amount, over \$267 million was spent on coal and gas. By no longer using coal and gas, the demand for coal on the world market would drop by \$183 million, while the demand for gas would drop by \$103 million. Whether this exit of demand from the market alone would have an impact on world coal and gas prices is questionable. However, if coal and gas burning plants were no longer a viable option for electricity and heat production in all of Canada, then there would be some substantial impact on the price of coal and natural gas. Since demand would slow, with supply initially unchanged, the price would be forced down. This would cause producers to slow production and possibly end operations.

Saskatchewan would not be at a total loss. The power previously generated by coal and natural gas would have to be produced in one way or another. One alternative is nuclear power, which is generated using uranium. In May 2002, the World Nuclear Association reported that, worldwide, 64% of electricity generated comes from fossil fuels, 16% from nuclear fission, and 19% from hydro². If fossil fuels were no longer used, and the relative percentages of nuclear to hydro remained constant, nuclear power would be used for over 45% of the world electricity production, while hydro would be used for over 53% of world electricity production. However, it is not reasonable to assume that 53% of world energy could come from hydro. In fact, estimates range from a 20% to 50% maximum portion of world energy production from hydro. Hydro-electric plants also have an immediate impact on the environment by altering wildlife habitat. In addition, while there are no direct emissions from either hydro or nuclear, there are indirect emissions that can be attributed to these plants. Nuclear plants cause up to 90% fewer emissions, including both direct and indirect, than hydro.

While it is not reasonable to assume that hydro could produce 53% of world energy, it is also not reasonable to assume that all fossil fuel energy production could be ended. We will consider two cases: first, that fossil fuel use in energy production returns to 94% of 1990 levels with the difference being produced through nuclear power; and the second being that fossil fuel use in energy production is reduced by 50%, with the difference being produced through nuclear power.

Including extraction, conversion, and enrichment, the approximate cost per kilogram of useable uranium is US\$930³. Canada sits on 433,000 tonnes of uranium, which is 14% of the total known world resource of uranium. The only two larger sources of uranium are Australia, which holds 28% of the world supply, and Kazakhstan, which holds 15% of world supply but suffers from political instability and a shortage of locally available skilled labour. With 1,000 kilograms per tonne, Canada sits on 433,000,000 kilograms of uranium. If each kilogram represents economic activity equal to the cost of extraction,

² "Energy for Sustainable Development" World Nuclear Association, May 2002

³ "The Economics of Nuclear Power" World Nuclear Association, June 2002

conversion, and enrichment, then Canada has a resource base worth US\$402.69 billion. At an exchange rate of \$1.56 Canadian per US\$, the resource base is worth \$628.2 billion Canadian.

In April 2002, the population of Canada was estimated to be 31,260,388. Canada would, therefore, have a resource base worth US\$12,881.80 per capita. Consider that the only operating uranium mines in Canada are located in Saskatchewan, and assuming that only 50% of the uranium reserves are found in Saskatchewan, then Saskatchewan stands to gain US\$402,690 per capita in economic activity if the entire conversion process occurs within the borders of this province.

Returning to the Kyoto Protocol itself, there will be a very real, very profound impact on the employment opportunities that exist in Saskatoon. SaskPower president John Wright made a statement on Monday September 23, 2002 that exceeding Kyoto emissions limits could cost the corporation \$50 million to \$250 million per year, which would result in a 5% to 25% increase in the rate to consumers.

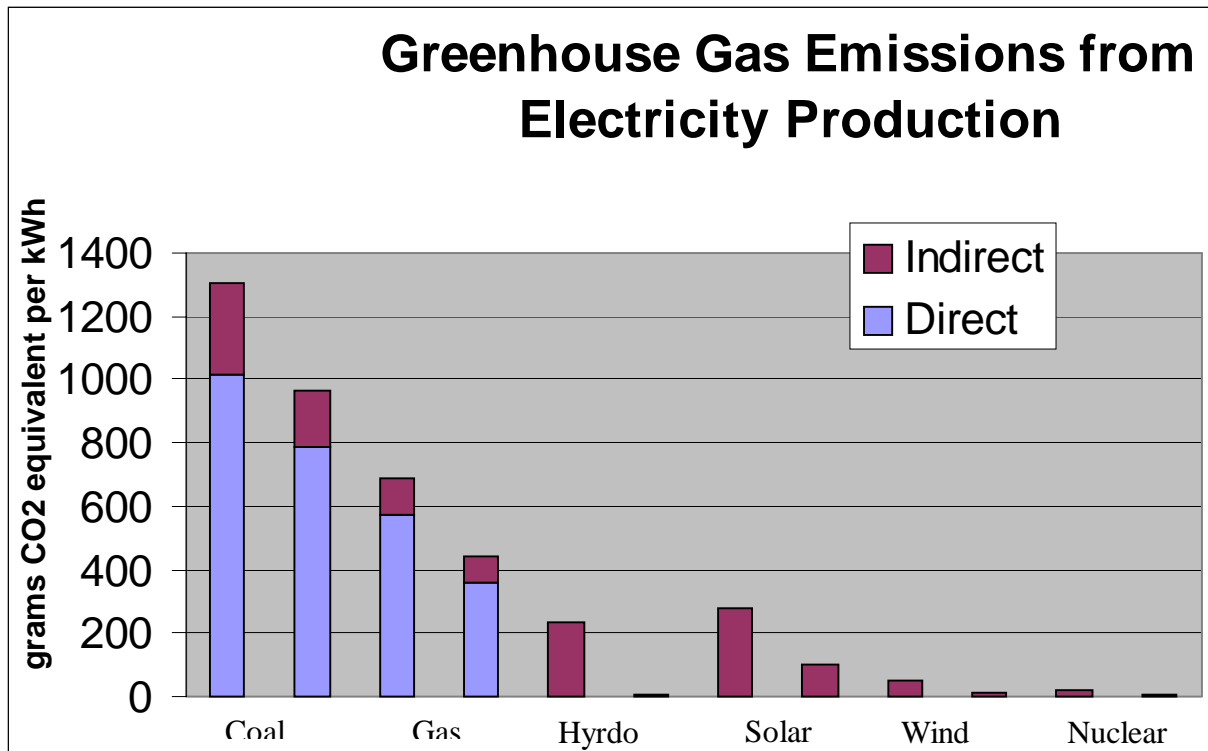
Based on these comments, Peter MacPhail, president of Ipsco Saskatchewan Inc., said "Five per cent (increase in electricity rates) would be into the millions of dollars..." When commenting on a 25% increase in rate, MacPhail said it "...would be of a magnitude that makes making steel uneconomical." And the result of steel production being uneconomical? Ipsco employs over 700 people in Saskatchewan. All of these jobs would likely be relocated to regions such as Manitoba that have access to cleaner forms of power resulting in reduced costs to deliver. "For Ipsco, you locate your steel mill where you can have your costs under control," said MacPhail.

CASE #1 – 94% of 1990 levels

In this scenario, we assume that all sources of greenhouse gas emissions are reduced to 94% of 1990 levels, including emissions from transportation and energy production. While it is not likely that meeting Kyoto targets would be achieved by a decrease in all areas, for comparison purposes and for economic impact estimation, we will assume that this is how Kyoto targets are met.

In 1990, total greenhouse gas emissions in Canada totaled 607,000 kilotonnes, therefore, the target level of emissions is 570,580 kilotonnes. Of the 1990 level, 95,300 kilotonnes were as a result of electricity and heat generation. The target level of energy production emissions is, therefore, 89,582 kilotonnes.

Below is a chart comparing emissions, both direct and indirect, from various sources of energy including coal, hydro, and nuclear. Based on these estimates, we are able to project the decrease in fossil fuel-burning plants that should be replaced by nuclear or hydro-electric plants.



For every kWh of electricity produced by coal instead of nuclear energy, between 957 and 1285 additional grams of CO² equivalent are being emitted. In 2000, emissions from energy generation totaled 128,000 kt. Therefore, in order to reach the Kyoto target level, between 29,897,276 and 40,144,200 kWh of energy production must be converted from coal to nuclear, if nuclear was the only alternative available.

Many scientists, economists, and ordinary citizens have reasons for believing one alternative energy generation method is superior to others. Gas burns cleaner than coal,

however, there are still much cleaner alternatives available. Hydro has no direct emissions, however, there can be serious ecological consequences that occur from altering the natural flow of water. Solar power also has no direct emissions, but the number of daylight hours is much lower in the winter months, when energy consumption is highest. Wind power, once again, has no direct emissions, however, the wind is somewhat unreliable and turbines are sometimes considered to be eyesores. Nuclear energy, while producing the lowest levels of emissions of the sources shown, also has risk involved, including storage methods for nuclear waste.

CASE #2 – 50% of 2000 levels

To reach 50% of 2000 levels, a reduction in emissions from energy production of 64,000 kt would be required. Applying the same methodology as in Case #1, a conversion of generating capacity from coal to nuclear of between 49,805,447 and 66,875,653 kWh would be required.

In both cases, and regardless of the alternative form of energy production, a major obstacle facing the province and country is time. Power plants do not simply jump up overnight. A nuclear power plant can take over 10 years to build. If any change in energy production emissions is to take place, construction or conversion of plants must begin immediately. Even if started today, the changes would likely not be done in time to have an impact on Canada's emission levels as they relate to the Kyoto Protocol.

The Hydrogen Fuel Cell

It is a popular belief that the Hydrogen Fuel Cell will mean the end of emissions from vehicles. While it is true that burning hydrogen virtually eliminates greenhouse gas emissions directly, there are indirect emissions that result from the process of splitting molecules to acquire hydrogen. Electricity must be used to separate the hydrogen from other atoms, and if this electricity were generated using coal power plants, the level of emissions would, in fact, increase.

Greener technologies must be used. By switching from burning fossil fuel in vehicles to hydrogen, there will be a dramatic increase in the amount of electricity that needs to be generated. Obviously, coal is not an option. This leaves other alternatives including gas, hydro, wind, solar, and nuclear. As previously mentioned, there are advantages and disadvantages to each, however, for Saskatchewan the best alternative would be nuclear power to capitalize on the natural resource base that exists within our borders. In addition to the economic impact, nuclear energy also represents a cleaner form of energy that has fewer deaths per terawatt-year. When examining deaths per event, hydro stands out with 550 compared with coal at about 40 deaths per event⁴.

⁴ An “event” is an accident occurring at a power plant. Example: explosion at a coal plant.

Nuclear Waste Disposal and Storage

Not only is the extraction and upgrading of uranium an intriguing opportunity for Saskatchewan, the disposal and storage of nuclear waste should also be seen as a tremendous chance to develop technologies and improve the safety associated with the nuclear industry.

In 1990, Pangea Resources identified Australia, Southern Africa, Argentina, and western China as regions having the appropriate geological credentials for the long-term disposal of nuclear waste. While Canada was not specifically identified, Saskatchewan shows remarkable similarities to the top pick by Pangea: Australia. Canada is a politically stable country with sound transportation infrastructure, expertise in the nuclear industry, and a role as a world leader in research and development. Saskatchewan could benefit by being a center for world nuclear waste storage. Vast lands in northern Saskatchewan offer a location for storage that minimizes human exposure. The construction of the storage facility alone would cause significant economic gains, however, long-term economic benefits would also be experienced.

The Pangea study projected capital costs of US\$6 billion, with an additional US\$400 million annually in operating costs.

Can We Reach the Targets?

To reach the Kyoto targets, a decrease in total emissions of 155,420 kt, or 22% below year 2000 levels must be achieved. Since conversion of power plants is not likely, other methods must be implemented to achieve the goals.

By removing all gasoline and diesel cars and trucks from Canadian roads, the targets would still not be achieved. However, if all types of domestic transportation, including cars, trucks, off road vehicles, propane and natural gas powered vehicles, railways, domestic marine, domestic aviation, and motorcycles were removed, Canada would meet the target emission levels.

Closing all mining and manufacturing industries would achieve less than half of the required change.

Ending all agricultural emissions would also reach less than half of the target levels.

Reasonably, because of the delay in implementing emission reduction strategies, Canada cannot reach the targets outlined in the Kyoto Protocol without dramatic sacrifices in the quality of life we currently enjoy, or without accumulating huge debt to invest in alternative energy generation and investment in green technology.

Emission Permit Trading

Emissions permit trading is an idea that has been used frequently in discussions surrounding the Kyoto Protocol. In essence, each country would be allowed a certain level of greenhouse gas emissions. If the country could reduce their emissions below the prescribed level, they could then sell the “emission permits” to other countries.

As the Kyoto Protocol would be a legally binding contract, many countries, including Canada and the United States, would be forced to purchase permits. If left to market forces, the price of permits could be astronomical. If the permits carried a fixed price, other concessions may have to be made prior to purchasing permits, including a reduction in trade barriers, foreign policy changes, and more.

Since, realistically, Canada would need to purchase permits, the cost of production in emission-producing industries would increase significantly. This would have severe consequences on Saskatchewan’s agricultural sector. In 2000, 60,000 kt of CO₂ emissions were generated as a result of enteric fermentation, manure management, and other agricultural releases of gas. While this level of emissions is relatively unchanged from 1990, permits may still be required, adding to the costs associated with an already struggling industry. Consider what the impact of having to purchase emission permits would be during a prolonged drought.

Permit trading, while excellent in theory, would not benefit Canadian industries, as it would drive up the cost of production, causing the price to consumers to increase correspondingly.

Ideally, assuming a permit-trading system is in place, the best thing that could happen for Canadian businesses would be that the United States does not ratify the Kyoto Protocol. Without the U.S. demand for permits, the price would remain relatively low. Since Canada would be a net purchaser of permits, Canadian businesses would be better served by the U.S. not ratifying.

Is the Environment a Federal or Provincial Responsibility?

While everyone should be concerned with the impact of various programs and activities on the environment, the responsibility under the Constitution falls on the Federal government. As such, the costs of meeting the requirements of the Kyoto Protocol, if ratified, should be covered by the Federal Government and not by Provincial Governments. Even if the environment was considered to be a Provincial responsibility, it should, therefore, be up to the provinces as to whether or not they wish to ratify the Kyoto Protocol.

With the Federal Government seeming poised to make the final decision on the ratification of the Kyoto Protocol, the financial responsibility should, therefore, be borne by the Federal Government. A decision made at the Federal level that has provincial implications must be funded through Federal funding mechanisms. In the end, regardless of what level of Government provides the funding, the burden will be shouldered by taxpayers and citizens of Canada through higher taxes, delayed tax cuts, decreases in service levels, or the delay of new program implementation.

A Made In Canada Solution

While many people are opposed to the Kyoto Protocol in its current form, they are still concerned about environmental quality and global warming. Rather than support Kyoto, they are proposing a variety of 'nation-specific' plans for improvement.

A 'Made in Canada' solution would involve a detailed examination of the natural strengths and weaknesses of the country and would build reasonable targets around the current economic and social framework that exists. For example, Canada may emphasize the development of green technologies that could be sold or shared with other regions. In a sense, this type of activity is already occurring in the form of Atomic Energy Canada Limited (AECL). AECL is the world leader in the development of efficient, safe, and cost-effective nuclear reactors. These reactors have been sold to numerous countries to help develop this clean form of energy.

Another Canadian plan may be to reduce the number of vehicles on the roads in urban centres by investing in improved municipal infrastructure and mass transit systems. While this development focuses on urban issues, a complementary plan may be in place in rural areas to reforest less productive agricultural lands, thereby filtering more greenhouse gases from the air.

These targeted solutions are said to be more effective and reasonable than to place one large limit on the entire country. A broad policy, while positive in theory, can have dramatic consequences on specific regions. If a broad policy is not able to consider the consequences on specific industries, such as the steel industry that is very electricity reliant, then some regions will be severely damaged while others go largely unaffected.

An example of these regional disparities can be shown by examining IPSCO, a significant employer of people in several Canadian provinces. If a broad policy causes a cost increase for inputs, Saskatchewan, Alberta, and Manitoba would be hardest hit. A province like B.C. would see little to no difference, as IPSCO operations there are relatively minor. Conversely, if specific measures were in place in Alberta, such as a continued commitment to reduce the emissions from well flaring year over year, then there would be benefit for the country while taking advantage of regional situations.

This 'Made in Canada' solution would also allow the country to reduce emissions at a rate that would not have dramatic consequences on quality of life, employment, or other factors that need to be considered.

ISO 14001 Certification: A Framework for Environmental Improvement

ISO 14001 certification is an interesting framework that could be of significant benefit when attempting to reduce greenhouse gas emissions.

This certification does not have prescribed levels that must be reached but is rather a commitment to continuous improvement. In a sense, it follows the logic that even the best can get better.

Applying a similar model to greenhouse gas emissions could be very positive in the overall goal of reducing emissions. This type of framework could also be applied to developing nations, as they are not forced to reduce production in order to meet targets, but can rather take the steps that they feel can be accommodated given their individual situations. For those regions that fail to show improvement year over year, they could be penalized through a system similar to Kyoto, while those that were successful would receive international recognition for their efforts.

When asked about the cost-effectiveness of striving for the ISO-14001 certification, 42% of respondents said that measurable cost savings were experienced, while 10% said there were unmeasurable savings, and 25% were too early in the process to properly respond. This shows that up to 77% of respondents to the survey had experienced positive benefits from an environmental program. The difference between ISO 14001 and Kyoto is that the ISO certification is a voluntary process. The success of participants in the ISO 14001 certification should act as an indicator that real environmental benefits can be achieved through market initiatives rather than government regulation, so long as the framework exists and benefits can be received for taking that initiative.

Conclusions

While the Kyoto Protocol has not yet been ratified by the Canadian Government, it is important that plans be in place in the event that it is approved. Upon approval, Canada will face major economic challenges, especially if the United States does not ratify the agreement. The competitive disadvantage that will exist in Canada will push an increased number of young, talented individuals to the United States to seek employment. The cost of living in Canada will increase due to the initial purchase price of permits and the new investment in technology that would be required. In addition, the jump in debt or taxes, the only two tools available to all governments to fund the required programs, would place a larger burden on the citizens of this country.

In short:

- The ratification of the Kyoto Protocol by the Government of Canada would have significant economic implications on the country as a whole, with more profound impacts being felt in provinces with large oil, gas, and manufacturing sectors.
- Saskatchewan stands to see enormous growth in the uranium industry, should the Kyoto Protocol be ratified, as nuclear power will play an integral role in the reduction of emissions, however, this growth will likely not offset the losses in manufacturing, agriculture, and oil and gas that we will experience in the short and medium terms.
- Long-term, as the demand for uranium increases, Saskatchewan will be positioned to be a global supplier of the highest quality uranium available. Steps to ensure this positioning occurs must be taken today, to avoid missing another opportunity as happened in the 1980s with the construction of a Cameco Corporation upgrader in Ontario rather than Saskatchewan.
- The Government of Saskatchewan must have a viable plan, one that maximizes the benefit of ratification while minimizing the negative elements of ratification, should the Government of Canada decide to ratify the Kyoto Protocol. This plan should include clearly established goals and funding mechanisms to ensure that Saskatchewan becomes a center of excellence in energy production and energy technology.
- The Government of Saskatchewan should play a leadership role in environmental technologies, however, these goals should not be achieved by supporting the ratification of the Kyoto Protocol without significant funding for changes coming from the Government of Canada. Ratification of this agreement has the potential to devastate the provincial and national economy.

Works Consulted

Economics Committee – Global Climate Coalition. “The Impacts of the Kyoto Protocol” May 2000.

Environment Canada. “Canada’s Greenhouse Gas Emissions, 1990-1999” 2001.

Environment Canada. “Costs of Kyoto – What We Know” 2001.

Finance Canada. “A Computable General Equilibrium Analysis of Greenhouse-Gas Reduction Paths and Scenarios”, October 31, 2001.

Goldberg, Marshall. “The Bottom Line on Kyoto: Economic Benefits of Canadian Action”, David Suzuki Foundation, April 2002.

Government of Canada. “Bill C-32: The Canadian Environmental Protection Act, 1999” July 5, 1999.

ISO-14000 poll. www.iso14000.com

Johnstone, Bruce. "Ipsco considers moving from Sask." Saskatchewan News Network, September 26, 2002.

KPMG. “Prospects for Saskatchewan’s Nuclear Industry and its Potential Impact on the Provincial Economy 1991-2020”, October 21, 1991.

McKittrick, Ross and Wigle, Randall M. "The Kyoto Protocol: Canada's risky rush to judgment", C.D. Howe Institute, October 2002.

Saskatchewan Chamber of Commerce. “Selected Issues – Annual General Meeting” May 10, 2001.

SaskPower. “Generating Facilities” www.saskpower.com/aboutus/genfac/genfac.shtml

United Nations. “Kyoto Protocol To The United Nations Framework Convention on Climate Change” December 11, 1997.

World Nuclear Association. “Energy for Sustainable Development” May 2002.

World Nuclear Association. “Global Warming” September 2001.

World Nuclear Association. “Supply of Uranium” April 2002.

World Nuclear Association. “The Economics of Nuclear Power” June 2002.

World Nuclear Association. “Energy Analysis of Power Systems” May 2002.

World Nuclear Association. "Energy Subsidies and External Costs" February 2002.

World Nuclear Association. "The Hydrogen Economy" June 2002.

World Nuclear Association. "Nuclear Share Figures, 1995-2001" August 2002.

World Nuclear Association. "World Energy Needs and Nuclear Power" July 2002.

World Nuclear Association. "International Nuclear Waste Disposal Concepts" April 2002.

World Nuclear Association. "World Uranium Mining" July 2002.

World Nuclear Association. "Canada's Uranium Production" May 2002.

World Nuclear Association. "Uranium Production Figures, 1995-2001" June 2002.

APPENDIX A – TrueNorth Project Stop

Excerpt from the Financial Post, Wednesday January 15, 2003, by Tony Seskus

Kyoto Pact Last Straw as TrueNorth Halts Project

TrueNorth Energy Inc. yesterday shelved its \$3.3-billion Alberta oilsands project, saying Ottawa's decision to sign the Kyoto Protocol was the final "straw."

David Park, chief executive of the Calgary company, said the massive Fort Hills venture was put on hold as it faced rising labour costs and tight financial markets. And it said the timing of last year's Kyoto debate could not have been worse.

"It can be described as the straw that breaks the camel's back," Mr. Park said in an interview.

"The timing and tone of the debate and the way the file was handled by the federal government was not helpful and it served to take some of the wind out of our sails at an inopportune time."

Mr. Park said the company, which partnered with tiny UTS Energy Corp. on the project, will continue to search for a much-needed third participant to move the development forward in the future.

He said he is committed to stay with the firm and stated TrueNorth continues to be "long-term believers in the future of Alberta's oilsands" and the project.

"This was a very tough personal decision," he said. "My ideal scenario would have been all the stars coming to alignment and launching the project."

TrueNorth's decision is likely to add more fuel to the Kyoto debate.

Fort Hills is the first oilsands project to be put on hold since Kyoto was ratified last month.

Analysts, however, have been quick to play down the role of Kyoto on TrueNorth's troubles.

"The broader issue is just the overall economics," said Tom Ebbert an analyst with Tristone Capital Advisors in Calgary. "The overall economics of the project were likely not robust enough with the preliminary capital costs that came out."

The Fort Hills project was to be Canada's fourth major open-pit oilsands development, joining the Syncrude and Suncor operations and the recently finished Athabasca project started last month by Calgary-based Shell Canada.

TrueNorth was slated to begin construction this year on the project near Fort McMurray in northern Alberta.

The company has already spent \$120-million to identify at least 2.8 billion barrels of reserves. And late last year, the project received key regulatory and Alberta government clearance to move ahead with plans to build a plant capable of producing 190,000 barrels of tar-like bitumen per day by 2008.

However, it failed to find at least one other partner – a step TrueNorth said was necessary when the project's price tag jumped by nearly \$1-billion last March.

TrueNorth made headlines in September when it said the search for a partner was being hindered by Kyoto. Some observers at the time said the problem had more to do with how the project was set up.

The Fort Hills project, unlike Syncrude and Suncor, did not plan to upgrade the tar-like bitumen coming from the oilsands. Instead, the bitumen was to be shipped by pipeline to Kock's refinery in St. Paul, Minn and then upgraded into petroleum products for the U.S. market.

Pat Bryden, oilsands analyst with FirstEnergy Capital in Calgary, said the plan to develop just bitumen with no upgrading likely made it harder to find partners.

UTS Energy Corp., whose sole project is Fort Hills (it has a 22% stake), saw its stock slide \$0.11 yesterday to close at \$0.32. Leigh Cassidy, the chief financial officer, said UTS hopes the project can still go ahead. UTS has invested about \$50-million in the venture since 1994.

The TrueNorth leases are close to key properties owned by Shell Canada and Syncrude. Mr. Park said "there will be no firesale" of its leases, but will continue looking for partners and options to develop the oilsands property. Canadian Oil Sands Trust, a major player in the Syncrude consortium, said it would be interested if the properties came up for sale.

"And I think that most of the owners of Syncrude would certainly be interested in pursuing that. Now, it's always a question of price," said Canadian Oil Sands president Marcel Coutu.