

# **Comments on the British Columbia *Greenhouse Gas Action Plan***

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The British Columbia *Greenhouse Gas Action Plan* was published in November 1995 by the British Columbia Ministry of Energy, Mines and Petroleum Resources and the Ministry of Environment, Lands and Parks. It reflects British Columbia's contribution to Canada's international commitment to stabilize emissions of greenhouse gases to 1990 levels by the year 2000. This is a goal shared by British Columbia; however, the authors of the *Greenhouse Gas* admit that it will not achieve stabilization of British Columbia's emissions.

Will the B.C. *Greenhouse Gas Action Plan* be successful in limiting the growth of B.C.'s greenhouse gas emissions to 4% above 1990 levels in the year 2000? Does it form the basis for paving the way to a smooth transition to a sustainable economy?

Before discussing the adequacies of the *Plan*, it is important to understand the very real needs for very stringent reductions in emissions of greenhouse gases. The first part of this paper discusses the developing scientific consensus that global climate change is a very real phenomena. It is a phenomena that is happening now and which requires real action.

This paper next discusses the emission reductions that will be necessary to avoid the worst effects of global climate change. These emission reductions must be kept in mind when assessing the B.C. *Greenhouse Gas Action Plan*. The Plan should not only stabilize emissions at 1990 levels, but also pave the way to major reductions in

emissions in the early part of the next century.

This paper finds that current trends indicate that both British Columbia and Canada will fail to meet their commitment to stabilize at 1990 levels by 2000. Indeed, unless implementation of the *Plan* is dramatically improved B.C. will far exceed the 4% growth in emissions. The *Plan* is weak in a number of regards. It fails to provide a credible quantification of projected emissions and emission reductions under the *Plan*. It does not include many essential cost effective measures to reduce greenhouse gas emissions. Finally, many important and positive aspects of the *Plan* do not appear to be being implemented.

## **Second Assessment Report**

In December 1995, the Intergovernmental Panel on Climate Change released its Second Assessment Report. Like the Surgeon General's report in the early 1960s, which drew a link between smoking and health, the 1995 report of the IPCC draws a firm link between greenhouse gas emissions and global health. It is a call for action, inviting governments to go beyond "no regrets" measures (i.e., measures which regardless of their greenhouse gas implications, have positive benefits).

The findings of the IPCC have all the more impact when one recognizes that they are a product of consensus. The report summaries are signed off by representatives from over one hundred nation's governments with technical input from thousands of scientists. Indeed, if one is going to criticize the work of the IPCC, it is for being too conservative. Often the report summaries water down the findings signed off by experts. A comparison of IPCC findings with the bulk of scientific opinion (as represented in published scientific papers) shows the IPCC to be consistently more conservative.

The nay-sayers, the few scientists that are questioning the danger posed by global warming, are becoming increasingly less credible. They tend to be financed by the oil and coal industries.

I will briefly go over the IPCC findings and their implications before discussion the *Greenhouse Gas Action Plan*. The results are startling.

## **Anthropogenic Climate Change is Here**

Although there is considerable "noise" of natural variability making it difficult to correlate global warming with human causes, the IPCC found that the balance of evidence suggests a "discernible human influence on global climate".

The report finds that there has already been an increase in global average temperature of between 0.3 and 0.6 degrees C. Temperature increases in some regions are much greater than the average. For instance, in the McKenzie Delta area

in the Northwest Territories increases have been around 1.7 degrees.

The IPCC has also found in some regions there is clear evidence of changes in extremes and climate variability indicators. These are consistent with global climate change, although it is impossible to firmly connect any particular region's changes and human activities.

## **What is Coming**

The IPCC forecasts global mean temperature increases of 1 to 3.5 degrees C, with a best estimate of 2 degrees C by 2100 if we continue with business as usual. Temperature increases will be greater in northern latitudes. Because of thermal inertia of the oceans, earth's temperature could rise by an equal amount after 2100. The growth in temperature would be even greater if it were not for the countervailing impact of other forms of pollution, such as sulfides which cause acid rain, which tend to increase the reflectivity of the earth's atmosphere.

It is important to put this predicted 2 degree C and possibly 3.5 degree C temperature rise in context. There is only a 4 degree C difference between current global temperatures and the depths of the last ice age, 20,000 years ago. At that same time, 20,000 years ago, Vancouver Island was completely under ice. Since the end of last ice age about 10,000 years ago, global surface temperatures have probably fluctuated by little more than 1 degree C. In the last 10,000 years temperatures have never fluctuated as rapidly as the 0.1 degree C per decade low end estimate.

"Warmer temperature will lead to more vigorous hydrological cycles, translating into prospects for more severe droughts and floods in some places" and a possibility of more extreme rainfall events.

The best estimate of sea level changes is by 2100 is 0.5 metres, with a potential range of between 0.15 and 0.9 metres.

These estimates do not factor in the real, but not anticipated, risk of positive feedback enhancing the greenhouse effect. For instance, forests unable to cope with changing climate burning and releasing more carbon dioxide or melting permafrost releasing methane. It is also important to realize that temperature rises do not stop in 2100. A combination of slow economic and population growth and continued use of fossil fuels could lead to a 10 degree C increase in global mean temperatures by 2250.

## **What will this mean for human and ecosystem health?**

## **Human habitat displacement**

Rising sea levels of half a meter could put 92 million people world-wide at risk of flooding due to storm surges. Estimated land losses in areas such as Bangladesh are approximately 18% and are as high as 85% for some island states.

## **Health**

Certain diseases such as malaria, dengue, yellow fever are expected to expand to new areas. Malaria alone is projected to claim an additional 50-80 million lives annually with a temperature increase of 3 degrees C. There is already evidence of some expansion in the geographic area's impacted by some diseases.

A recent study predicted that heat related deaths in Montreal could rise from its current level of about 10 deaths per 100,000 to around 170 deaths.<sup>1</sup>

## **Forests**

Temperature changes faster than what forests can adapt to are expected to lead to the disappearance of certain forest types. Large amounts of carbon may be released during the transitions (an incident of positive feedback not factored into the climate change models). Canada's boreal forests would be reduced to a fraction of their current range. There has already been a 20% decline in Canada's boreal forest biomass in the last 20 years.<sup>2</sup>

## **Hydrological Systems**

A report by Environment Canada in 1994 predicted an average winter warming on the coast of B.C. of 4 degrees C in the winter and 2.5 degrees C in summer by 2050. This could mean a displacement of snowlines upwards by as much as 1,000 meters and a reduction in snowpack to between one-half and one-sixth their current size.<sup>3</sup> There would both be an increase in precipitation, run-off and flooding in winter and a decrease in precipitation and run-off in the summer.

## **Fisheries**

The Environment Canada report predicted higher winter flows damaging spawning grounds, reduced survival and growth of fish because of increased stream temperatures, and damage to Fraser watersheds salmon due to increased predation by warm water species.<sup>4</sup>

The Department of Fisheries and Oceans has already blamed this years collapse of Fraser salmon on predation by mackerel caused by the warm Pacific El Nino current. Similarly, DFO is blaming this year's 80% collapse in Queen Charlotte chinook on El Nino.<sup>5</sup> While El Nino is a regular phenomena the recurrence of El

Nino in 4 of the last 5 years combined with its longer duration is unprecedented.

In the Great Lakes, Environment Canada has warned that resident fish species could disappear.

## **Food Shortages**

The IPCC predicts food shortages in those areas of the world which are least able to feed themselves. Although there is some potential for increased food production in Northern countries, this is only true if increased summer droughts reduced runoff and increased pests do not impact agriculture.

## **The Total Cost**

Trying to calculate and give monetary figures to global loss of biodiversity and loss of human life, disease and changes to landscapes is fraught with difficulty. Intangible values such as ecosystems can be given short shrift and cumulative figures tend to mask horrendous impacts on those nations which will suffer the most and can afford it the least. Economists' discounting tends to make acceptable the visitation of losses on future generations which our current generation would never accept. Moreover, attempts to monetize climate change damages often only consider damages up to some point in the future even though the effects could continue indefinitely and grow more severe.

Nevertheless, some economic estimates show the severity of the problem. The Ministry of Transportation and Highways recently published a study estimating the damage of carbon dioxide as being \$1,000 per tonne. It simply used a low discount rate, took the unprecedented view that humans in the third world should be valued equally to humans in wealthy countries and applied the precautionary principle by using high end estimates of damages.<sup>6</sup> Work done by a leading climate change economist for the B.C. Ministry of Environment estimated damages caused by a tonne of carbon dioxide as being equal to \$80 to \$200 U.S. per tonne.<sup>7</sup>

## **What Needs to Be Done**

The IPCC states that a 50-70% decrease in global emissions of greenhouse gases is necessary to stabilize greenhouse gas concentrations in the atmosphere. Using IPCC's latest report, work has begun on calculating what emissions reductions are necessary in the next 15 years if we are to have a "safe landing". In other words, what do we need to do now if we want to avoid unacceptable environmental or economic outcomes. This work is being used to guide international negotiation of binding emission reductions protocol.

The researchers found that if we want to avoid:

- global temperature increases of more than 1 degree C because of human

- interference,
- a rate of change greater than 0.1 degree C per decade,
  - sea level increase of more than 0.2 meters, and
  - the need for emission reductions of greater than 2% in any year,
  - 2010 emissions from industrialized countries would need to be reduced to between 36% and 63% of 1990 levels.

Even if the "safe landing" criteria are relaxed by a factor of one, 20% cuts by 2010 are necessary if we want to avoid imposing on future generations the need for even more drastic emission controls or wanted to give future generations the choice of avoiding the ecological damage inherent in the relaxed "safe landing" criteria.

In the international negotiations towards a binding emission reduction protocol by 1997 a number of nations are calling for tough actions. Germany is calling for a 15 to 20% reduction in emissions from 1990 levels by 2005. Italy is calling for an eventual 50% reduction. The Association of Small Islands States is calling for a 20% reduction by 2005.

At first these sorts of reductions may seem impossible given our fossil fuel dependent economy. But, in Canada and abroad huge amounts of work have gone estimating what can be done without negative impacts on the economy. The estimates of reductions possible through technologies which yield net savings tend to be around 10 to 30% reductions from 1990 levels possible at no cost.

Work done by the leading economic forecasting group in Canada shows that the Canadian and especially the B.C. economy would have very high benefits from stringent emission reduction measures.<sup>8</sup> A package of measures that would reduce B.C.'s emissions by 11% in 2010 was estimated to increase Canadian employment by 85,000 by 2010.

## **What is Canada Doing?**

The evidence is clear that emission reductions from 1990 levels are necessary and necessary in the short term. There also appears to be considerable international support for stringent reduction measures. Canada and most other industrial countries are committed to stabilization at 1990 levels by 2000. Those nations and provinces which have been successful in stabilizing their emissions at 1990 levels will have a clear advantage in meeting future targets.

Unfortunately, Canada has one of the worst records in greenhouse gas emissions growth among industrialized countries. Natural Resources Canada estimates that Canada's emissions will grow by 13% by 2000.<sup>9</sup> In British Columbia, between 1990 and 1994, carbon dioxide emissions increased by almost 9%.<sup>10</sup> Both Canada and British Columbia are clearly failing the international community by failing to live up to our international commitments. We are failing to meet the needs of the global and our own ecosystems. And we are failing our own economic well-being by not

paving the way to a smooth transition to a sustainable economy.

## **British Columbia's *Greenhouse Gas Action Plan***

How does British Columbia's *Greenhouse Gas Action Plan* fit into the projected increases and the drastic need for action? In answering this question I will focus on transportation.

Transportation is important in that it accounts for 47% of B.C.'s carbon dioxide emissions. Passenger cars and light duty trucks account for around 19% of the total. Based on growth and projected growth in vehicle kilometers traveled, and the failure of vehicle manufacturers to improve fuel efficiency, the Ministry of Environment, Lands and Parks has projected a 65% increase in greenhouse gas emissions from the light duty vehicle fleet in B.C. between 1990 and 2020.

Moe Sihota has done much to push the issue of greenhouse gases on the national stage, and he should be congratulated for doing so. I hope Mr. Sihota continues to push the greenhouse gas issue at the Canadian Council of Ministers of the Environment and other forums. His leadership in this regard is vitally important and hopefully will help establish a national plan that will facilitate provincial action.

Unfortunately, British Columbia has not shown as much leadership as one might hope for in developing and implementing its own plan:

- **Form.** It lacks the sort of defined assumptions as to baselines and effectiveness of measures.
- **Content.** The *Plan* doesn't contain certain key measures which are important aspects of cost effective greenhouse gases emission reductions.
- **Implementation.** The *Plan* is lacking in firm commitments to new strong measures and many of the vague commitments are not being implemented.

### **The Form of the *Plan***

In many ways the *Greenhouse Gas Action Plan* fits the pattern of plans submitted under the Voluntary Challenge and Registry Program. The *Plan* does not give realistic baseline assumptions that allow one to determine if a measure is a real change from "business as usual". For instance, improved appliance energy efficiency standards and Energy Codes for Houses and Buildings are already factored into Natural Resources Canada's projection of a 13% hike in carbon dioxide emission between 1990 and 2000.<sup>11</sup> But these are also counted by B.C. as action points that will help close the 13% gap.

In terms of quantification the *Plan* does not give a quantification of emissions benefits of specific measures. Nor does it give sufficient details to begin determining

the reductions that might result.

The *Plan* does give some overall projections. It estimates a 7,500 kilotonnes increase in greenhouse gas emissions if B.C. had done nothing. It estimates a 2,300 kilotonnes growth in emissions 1990 to 2000 under the *Plan*. This is 4% higher than 1990 levels.

However, there was a 4,000 kilotonne increase in carbon dioxide emissions from 1990 to 1994. To limit increases from 1990 to 4%, the *Plan* would need to reduce emissions by 1,700 kilotonnes in the next five years. When one looks at the content and implementation of the *Plan*, I think it is clear we will not meet that target.

The *Plan* also fails to give any quantification of what is happening to British Columbia's sinks of carbon. British Columbia's forests contain huge amounts of carbon, but this can be released into the atmosphere through natural disease and decay as well as through forestry activities such as slash burning and the eventual burning or decomposition of B.C. forest products. The *Plan* does not give any indication as to whether current B.C. forest practices are maintaining the carbon content of forests and forest soils.

## **Content of the *Plan***

### **Promises to Evaluate rather than act**

The *Plan* refers to a number of initiatives which would, if implemented, show government leadership. Unfortunately, for a huge number of these initiatives the *Plan* does not contain specific commitments other than to evaluate an option:

- The government will evaluate options for a minimum renewable energy content in fossil fuels; introducing zero emission vehicles and improved Energy Code requirements;
- The government will evaluate use of renewable based diesel in BC Ferries;
- The government will evaluate options for regulating greenhouse gas emissions and for greenhouse gas emissions trading.

All of these are potentially very valuable initiatives. But we need to go beyond evaluation. Moreover, for some of the initiatives it seems clear that, at the time the *Plan* was published, the government had rejected taking action in regard to an option that was supposed to have been evaluated.

### **Few Price Based Mechanisms**

If you want to reduce greenhouse gases cost effectively, you need to create price signals. Consumers need to be encouraged to drive less, to buy more fuel efficient cars and to consume less energy intensive products. Producers need to have a financial motive for developing and implementing more energy efficient processes.



This is repeated in any literature on the subject.<sup>12</sup>

There is a clear reluctance in the BC *Greenhouse Gas Action Plan* to commit to a measure, even commit to evaluating a measure, if it could be construed as placing costs on consumers. Other than the reference to evaluating tradeable permits, there is nothing relating to use of fiscal or economic instruments.

Of all the greenhouse gas emission measures analyzed by Natural Resources Canada, a carbon tax of \$20 per tonne carbon, increasing to \$25 in 2005 would have the second largest impact. Only fuel efficiency standards for cars had greater impact. Analysis also showed that the tax, even if done unilaterally, would not hurt the Canadian economy (as long as revenue was used to reduce the GST or income tax).<sup>13</sup>

Similarly, a revenue neutral feebate program where gas guzzlers are charged, or fuel efficient cars given a rebate, equal to \$400 for each liter per hundred kilometers above or below the average fuel efficiency of vehicles would save over \$2 billion by 2010 and reduce emissions by 5 megatonnes.<sup>14</sup>

An increase in motor fuel taxes of 3.5 cents per liter in 1996 and an additional 2 cents per liter in 2005 and 2010 would reduce Canadian emissions by 13 megatonnes by 2010.<sup>15</sup>

British Columbia has shied away from even considering implementation of these measures at a provincial level.

There is no reference to effective transportation demand measures such as road tolls or increasing taxation of parking. We cannot expect to reduce vehicle use if we subsidize motor vehicle transportation.

## **CAFE Standards**

One regulatory measure which is conspicuously absent is fuel efficiency standards. Although fuel efficiency standards would be best implemented on a North American basis, they can be implemented on a local scale, simply by requiring manufacturers to sell a more efficient mix of vehicles. Along with a carbon tax, improved fuel efficiency standards for cars are the most important emission reduction measure evaluated by Natural Resources Canada. Natural Resources Canada estimated that a tightening of average fuel economy standards to 5 liters per 100 kilometers between 1999 and 2005, would lead to a reduction in CO<sub>2</sub> emissions of almost 50 megatonnes by 2010 and would save Canadians \$4 billion by 2010.<sup>16</sup> The BC *Greenhouse Gas Action Plan* does not even promise to evaluate this measure.

## **Putting Words in Action**

The greatest plan of action in the world, with all the quantification and all the

details, is not going to do anything if it is not implemented. I have not been able to analyze all the action points, but for almost every action point with which I am familiar the government's implementation has been disappointing.

## **Renewable Fuel**

Action point 26 is to evaluate the options to require a minimum 10% renewable energy content in gasoline and diesel. According to staff at the Ministry of Environment, Lands and Parks, this action item had the greatest estimated emission reduction benefit of any action point in the *Plan*. However, within three weeks of the publication of the *B.C. Greenhouse Gas Action Plan*, the province enacted the *Cleaner Gasoline Regulation*. The *Cleaner Gasoline Regulation* contained no renewable energy content requirement. Indeed, the reformulated gasoline required by the *Regulation* has marginally higher life cycle greenhouse gas emissions than current gasoline. There does not appear to be any ongoing discussions within government or with industry regarding renewable energy content requirements.

## **Alternative Fueled Vehicles**

The *Plan* discusses promotion and purchase of alternative fuels vehicles and introduction of advanced technology vehicles such as zero emission vehicles. Some alternative fuel vehicles have slightly lower life cycle emissions of greenhouse gases, and electric vehicles have significantly lower emissions.

The government has acted on its commitment in this area by enacting the *B.C. Motor Vehicle Emission Reduction Regulation*. The B.C. Regulation requires California low emission vehicles and sets targets for "cleaner technology vehicles" sales. However,

1. California low emission vehicles have the same emissions of greenhouse gases as conventional vehicles;
2. the cleaner technology vehicle sales targets are targets only; contrary to continuous misreporting in the press they are not mandatory;
3. "cleaner technology vehicles" include gasoline vehicles which have the same greenhouse gas emissions as conventional vehicles;
4. the B.C. regulation does not have the stringent requirements found in California, New York, Massachusetts and Connecticut which would either encourage or require the sale of zero emission vehicles with much lower life cycle emissions of carbon dioxide.

In comparison, the federal government has a legislated mandate to purchase alternative fueled vehicles which have slightly lower emissions of greenhouse gases. For greenhouse gases the federal government has more effective legislation.

Premier Clark said the government will purchase alternative fueled vehicles. If this

is going to be effective it should be specific, aimed at alternative fueled vehicles with the lowest life cycle emissions of greenhouse gases. Like the federal government, B.C. should adopt mandates for the percentage of new government vehicles which are alternative fueled. It should also target government procurement of fuel efficient vehicles. Much greater emission reductions per dollar could be achieved through government purchase of fuel efficient vehicles.

## **Transportation Demand Management**

Transportation Demand Management is the key to truly sustainable transportation. Action point 19 of the B.C. *Greenhouse Gas Action Plan* is putting B.C.'s Transportation Strategy into action. Again, government action is inconsistent with reducing greenhouse gas emissions.

The B.C. strategy includes expansion of several highways in the Lower Mainland to include a lane for high occupancy vehicles. The Ministry of Transportation has said that they will count any vehicle with two or more passengers as being a high occupancy vehicle. There is strong evidence that creating any new capacity will lead to more greenhouse gas emissions. More roads leads to more traffic. Calling a lane an HOV lane when there are only two passengers is clearly simply putting a green spin on business as usual.

At the same time, the funding allocated to BC. Transit is inconsistent with implementing the Greater Vancouver Regional District's Livable Regions Strategy. In other aspects of transportation demand management, the province has undertaken few concrete measures. It has employed quite a few employee transportation administrators in provincial bureaucracies. These staff have worked to decrease single occupancy vehicle use, but there has been a lack of supporting policies such as money for bicycle facilities or parking pricing. Once again, there has been no implementation of pricing policies which would truly encourage alternatives to the single occupancy vehicle.

## **Scrap Program**

The action point 23 calls for a program whereby old vehicles are bought and scrapped. Scrap programs are usually aimed at reducing local pollutants. Because scrapping cars increases the demand for new cars, and because manufacturing new cars leads to emissions, a scrap program will only have an impact if it is well targeted. Because of the failure to improve fuel efficiency in the last ten years (and a marked shift in consumer purchasing to larger, gas guzzling vehicle) it can not be assumed that an earlier car will be more fuel efficient. Ideally a program would be aimed at bigger cars built before 1977.

The British Columbia plan involves either a rebate on the price of a new or used car or a free transit pass when the owner scraps a car that is older than 1982. Because of only marginal improvements in fuel efficiency since 1982, and because purchasing

new cars is the most attractive reward for scrapping an old car, it is questionable whether the B.C. Program will have any impacts on emissions of greenhouse gases.

In summary, so far there does not appear to be much in the implementation of the *Greenhouse Gas Action Plan* which will reduce greenhouse gas emissions from projected levels. In some areas there have been disappointing failures too, such as the apparent rejection of the single most effective measure listed in the *Greenhouse Gas Action Plan* (i.e., the failure to adopt a reusable content requirement).

## **Building Energy Efficiency**

In areas other British Columbia's efforts may be better than other provinces, but are still often lackluster.

For instance, in improving energy efficiency of buildings, on the one hand, B.C. along with Quebec, Manitoba and Alberta, is in the forefront of implementing the National Energy Codes for houses and buildings. By comparison, Ontario is considering dropping its energy efficiency standards. .

However, as I already noted, adoption of the National Energy Code was something Natural Resources Canada assumed Provinces would be doing anyway in their business as usual scenario. British Columbia could have gone beyond business as usual. The National Energy Codes are designed to ensure that any increased costs of energy efficiency are paid for in reduced energy costs. Although the National Energy Code is designed to factor in the environmental costs of energy consumption, British Columbia has chosen not to incorporate these costs. At least one other province, Manitoba, is proceeding with using a "environmental multiplier" to factor in the environmental costs of energy use.

## **Energy Supply and Demand**

Shifting electrical production to clean sources and reducing electrical demand are essential elements of a B.C. *Greenhouse Gas Action Plan*. The largest source of greenhouse gases in B.C. is the British Columbia Hydro Burrard Thermal Plant. Carbon dioxide emissions in B.C. from electrical power generation have grown from 1,227 kilotonnes in 1990 to 2,400 kilotonnes in 1994.

The B.C. Government has made some positive steps in terms of purchasing renewable energy sources. For instance, recently the government announced tentative plans to purchase 59 MW of electricity from two renewable sources. This compares to a B.C. generating capacity of almost 12,000 MW,<sup>17</sup> approximately 960 MW from the BC Hydro Burrard Thermal Plant and 1,100 MW from B.C. fossil fuel based thermal generation.<sup>18</sup>

A more significant policy would be a blanket direction from the B.C. Government to B.C. Hydro to pay a premium for electricity from environmentally friendly sources.

This sort of policy exists in Washington State where Bonneville Power pay a 15% premium for renewable sources of electricity. The California Public Utility Commission similarly requires utilities payments to independent power producers to reflect the avoided environmental cost of clean, renewable energy sources.<sup>19</sup> In Oregon public demand lead to a 4% premium being paid to renewable sources by Salem Electric.<sup>20</sup>

One action item where government implementation was initially quite good, but has now been reversed, has been in integrated resource planning for utilities. Integrated resource planning requires a consistent evaluation of the environmental costs and benefits of power generation and conservation. It tends to favour renewable sources and reduce electrical demand through conservation.

The B.C. Utilities Commission has been a leader in requiring integrated resource planning. It is one of three Canadian utility commissions to require integrated resource plans. Unfortunately, what one arm of government giveth the other taketh away. B.C. Hydro, a Crown Corporation, challenged the Utilities Commission's ability to require integrated resource planning in the courts. Hydro's case succeeded. Thus, a Crown corporation has succeeded in reversing one component of the B.C. *Greenhouse Gas Action Plan* where the Crown has taken some action.

There needs to be a firm commitment from government to amend the *Utilities Commission Act* to require integrated resource planning. The government could also show leadership by requiring the factoring in of avoided environmental costs when decisions are being made as to purchases from independent power producers.

## Conclusion

Recognition that climate change is a real phenomena requiring real action has been slow in coming; however, in the last five years, we have crossed a watershed where there is general scientific consensus that human emissions of greenhouse gases are affecting the global climate system. Emission reductions must happen in the short term to avoid unacceptable damage to the global ecosystem. The costs of not acting are simply unacceptable. Those nations and provinces which fail to rein in their emissions will be required to make more rapid emission reductions in the future. The cost of deferring action may be to lose the opportunity for improved economic and energy efficiency in the short term, and to accept greater economic dislocation in the long term.

Both Canada and British Columbia are clearly failing to meet their international commitments, and British Columbia appears to be failing to contain its increases in emissions from 1990 levels to the 4% in the year 2000 forecast in the *Greenhouse Gas Action Plan*. Many of the important measures in the *Plan*, for instance adoption of a renewable content requirement for diesel and gasoline, are not being actively pursued. Other strategies such as use of a carbon tax, road tolls, surcharges for gas guzzlers and rebates for energy efficient vehicles, and other economic incentives for

energy efficiency are absent from the *Plan*.

It is impossible to judge how the implementation of the *Plan* will effect British Columbia's emissions over the next five years. The *Plan* does not contain detailed assumptions as to baseline emissions or details as to the reductions which can be expected from different emission reduction measures.

If British Columbia is to ensure a smooth transition to a sustainable economy, it must both continue pressing for a strong national greenhouse gas emissions reduction strategy and begin implementing an effective plan at the provincial level. An effective plan will include a range of issues including measures to improve the fuel efficiency of new vehicles, measures to support renewable, environmentally friendly power providers, measures to reduce use of single occupancy vehicles, and fiscal incentives to improve energy efficiency throughout the British Columbia economy.

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