



SEARCHING FOR THE GOOD LIFE IN A CARBON NEUTRAL BC

Meeting BC's Greenhouse Gas Reduction Targets with Fairness and Equity

FEBRUARY 2008



CCPA
CANADIAN CENTRE
for POLICY ALTERNATIVES
BC Office

A CLIMATE JUSTICE DISCUSSION PAPER

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February 2008

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Contents

Preface	4
Summary	5
BC's Climate Action Plan.....	6
Policy Options: Carbon Pricing, Caps and Quotas, Regulation and Other Alternatives.....	7
Building Sustainable Communities.....	9
Introduction: Tipping Points	11
Climate Change Impacts in BC	13
<i>Box: Sorting Through the Scientific Jargon</i>	14
A Review of BC's Climate Action Plan	17
<i>Box: Summary of BC Government Climate Change Policy Initiatives</i>	18
The Inequality Challenge	23
A Look at the Climate Policy Toolbox	26
Carbon Pricing and Caps.....	27
Regulatory Measures	29
Innovation, Industrial Policy and Just Transition Strategies	30
Sustainable Communities and BC's Quality of Life	33
Urban Development.....	34
Rural BC and Resource Industries	36
Agriculture	36
Electricity Generation	37
Forestry	38
Oil and Gas	39
Relationships with Other Jurisdictions	40
Conclusion: Keeping Everyone on the Bus	42
Notes	45
References and Further Reading	46

PREFACE

Usually, at this time of year, the CCPA-BC publishes its *BC Solutions Budget*, our alternative provincial budget, in which we re-estimate the province’s fiscal position, show how BC can address its most pressing social and environmental needs, and cost-out our policy recommendations.¹ This year, we offer something different in advance of what many anticipate will be a “green” BC Budget.

This discussion paper reviews the major economic policy issues associated with addressing climate change, and the actions of the BC government to date. More fundamentally, it seeks to add a social justice lens to the discussions on how to meet our greenhouse gas reduction targets. This approach is vital to the urgent environmental imperative at stake. As we move forward in meeting the climate change challenge, if we do not seriously address issues of equity, social justice and inequality in our policy choices, and engage in a meaningful democratic process, we risk losing public support.

With this document, we also formally launch the Climate Justice Project, a new multi-year initiative led by CCPA and the University of British Columbia in collaboration with a large team of academics and community groups from across BC. The Climate Justice Project aims to develop a concrete policy strategy that would see BC getting serious about reducing greenhouse gas emissions, while simultaneously ensuring that inequality is reduced, and that societal and industrial transitions are just and equitable. Past industrial revolutions have created tremendous upheaval and left large segments of society to fend for themselves. This project aims to avoid such a fate. Because there is much research ahead of us, in this discussion paper we do not necessarily come to specific recommendations in many areas, but rather, attempt to survey the issues and point out sound and equitable policies where possible.

Summary

Climate change is the overarching issue of our times. The BC government has committed to reduce greenhouse gas (GHG) emissions by at least one-third by 2020 and by 80 per cent by 2050. Many questions remain about the policies required to get there, but the province is moving in the right direction by setting targets.

As we figure out how to turn targets into action, we have a unique opportunity to create win-win solutions that bridge our social and environmental goals. With innovative ideas and policies we can simultaneously improve our quality of life and reduce our greenhouse gas emissions. We need to envision what “the good life” looks like in a sustainable, carbon-neutral province. Meeting our targets will require major transformations in our economy and daily lives. We need to make sure, however, that those transformations do not have unintended consequences – that some groups in society do not pay an unfair price for our choices.

This discussion paper reviews the major economic policy issues associated with climate change, the actions of the BC government to date, and more fundamentally, adds an inequality lens to the discussions on how to move forward. This is more than a matter of ethics or economics. If we do not seriously address fairness and inequality in our policy choices, and use a broadly democratic process to make those choices, we risk losing broad-based support for action. We must connect the climate challenge to the other great “inconvenient truth” of our time – the growing gap between the wealthy and the rest of us. Many climate change policies may actually increase inequality, unless this is recognized in policy design.

BC's Climate Action Plan

Over the past year, the provincial government has identified the “low hanging fruit” of emissions reductions. A Climate Action Team has been tasked with identifying further areas where GHG emissions can be reduced. Efforts to date have focused on *mitigation*, or reducing BC's emissions, with comparably little effort on *adaptation*, or measures to help us deal with the effects of climate change (such as extreme weather events).

There is growing scientific consensus that we must do everything in our power to avert a 2°C temperature increase above pre-industrial times (i.e. 200 years ago). Global temperature is already about 0.7° above that level, and another 0.5° is likely “locked in” due to an ever-thickening blanket of heat-trapping greenhouse gases in the atmosphere. With this in mind, even though the 2020 targets for BC will be challenging to achieve, there is good reason to believe that BC's 2050 target is not ambitious enough. If we take the 2° limit seriously, and assume an equal per person amount of emissions on a global scale, BC's emissions reductions by 2050 will need to be closer to 95 per cent or more.

As we contemplate the 2020 goal, it becomes clear that the emissions target is at odds with two other major priorities of the provincial government. The first is the growth of the oil and gas sector, which alone accounts for more than one-fifth of BC's GHG emissions. Only a few years ago, the BC government was actively promoting expansion of this sector, and has resisted measures that would slow production.

The second is the Pacific Gateway strategy that will expand road infrastructure in Metro Vancouver and twin the Port Mann Bridge. Because transportation accounts for two-fifths of BC's GHG emissions, Gateway will only reinforce an unsustainable pattern of sprawling suburbs and commuters in single-occupant vehicles.

We must also have a much broader process of public engagement – a new, open and democratic Conversation on Climate Change. Such an exercise would greatly complement the work of the government's Climate Action Team. To date, BC's climate planning has been an exclusive and secretive process that excludes the perspectives of key groups such as labour unions, anti-poverty groups and others.

Policy Options: Carbon Pricing, Caps and Quotas, Regulation and Other Alternatives

Two major questions must be posed of any policy meant to address climate change:

- First, is it *effective* in bringing about the type of change we require (meaning, will it lead to lower overall emissions); and
- Second, what are the *impacts on different population groups*, income levels, and regions of the province (meaning, will it reduce or increase inequality).

Another aspect to consider is the impact on quality of life. Ideally, measures that address climate change can and should lead to improvements in our ability to live healthy, secure and rewarding lives.

A bold, effective and fair climate change plan will require a mix of policy tools – effective regulation, carbon pricing, just transition plans for affected workers, industrial strategies, and large-scale public programs (especially with respect to public transit and housing).

Currently, households and businesses pay nothing when they emit carbon dioxide and other greenhouse gases into the atmosphere. The object of *carbon pricing* is to make it more expensive to do so, and as a result, encourage environmentally-friendly behaviour. But higher prices mean we also need to carefully consider distributional issues. The poorest in society (and perhaps a sizable share of the population depending on the activity) could get priced out.

Two variations of carbon pricing are frequently invoked: *carbon taxes* are like a sales tax on carbon-intensive goods and services; *cap-and-trade systems* set a cap on the overall quantity of emissions, and after allocating (or auctioning) rights to emit carbon, let the market determine the price. Cap-and-trade appears to be the province's preferred method for reducing emissions by large industrial emitters, while carbon taxes are generally advocated for consumer emissions.

A shortcoming of carbon taxes is that they do not directly limit the quantity of emissions – they only make them more expensive. Thus, it remains an open question as to how effective they would be, particularly in areas like transportation. There is great uncertainty around how high a carbon tax must be in order to change behaviour. Based on the available evidence, the price of emitting GHGs would eventually need to be very high in order to make a difference.

At a household level, another alternative would be a rationing system of *carbon quotas*. In such a system, emission rights are allocated as equal per person amounts. Intensive emitters (primarily the rich) would have to pay low emitters (mainly the poor) in order to emit more than their fair share. Some degree of wealth redistribution is thus built into a quota system.

A bold, effective and fair climate change plan will require a mix of policy tools – effective regulation, carbon pricing, just transition plans for affected workers, industrial strategies, and large-scale public programs (especially with respect to public transit and housing).

Regardless of which system (or combination of systems) is chosen, prices for goods and services that emit GHGs will go up. As a result, low-income people will pay a greater share of their income for things like home heating and driving. But what really matters is where the money collected from carbon pricing goes and how it is used. Governments could use these funds to offset regressive impacts (for example, through tax credits) and to reinforce green behaviour (such as through subsidies for housing retrofits). If the proceeds are spent in a socially progressive manner, the outcome could be not only a greener province, but a more equitable one as well.

One thing is certain: relying on a carbon tax alone will not be sufficient, given the deep emissions reductions required in such a short timeline. Tough regulatory measures will also be needed, including a hard cap on total emissions (with the cap decreasing over time until our targets are met). Ideally, these measures would work in concert with each other.

Innovation will also be critical. BC needs industrial strategy approaches in areas such as alternative power, energy efficiency, transportation, “green” production processes, and carbon sequestration. Meeting our climate change targets will mean job losses in some sectors and job gains in others. Those who do lose their jobs must be given options, particularly in related sectors experiencing overall growth. Thus, just transition strategies for workers are needed, including education and training, moving allowances, and income support.

The impact of adaptation policies on vulnerable groups is also of concern. Low-income people are less able to adapt in a world where wealth and access to decent income matter. For example, wealthy families can self-insure against unforeseen circumstances like extreme weather events. Publicly-provided forms of insurance (unemployment insurance, social assistance, public health insurance) are crucial for everyone else. Aboriginal and resource-dependent communities will struggle harder with the impact of rising sea levels and forest infestations. Extreme weather events point to other challenges: the 2006 Vancouver boil-water advisories, for example, led to conflict over limited bottled water supplies, and the rapid shift from water as a public good to a private one.

Low-income people are more likely to rent their accommodation, and may also be less aware and less prepared for an extreme weather event – consider the case of New Orleans and its displacement of poor people, with recent reconstruction efforts benefiting more affluent families. Ultimately, a large-scale housing retrofit program, with special measures for low-income housing, will be needed.

Building Sustainable Communities

The intersection of climate change and social justice must alter how we think about: urban development; rural areas and BC's resource industries; and, our relationships with neighbouring jurisdictions and the rest of the world.

Transportation, as a major source of GHG emissions, must be at the centre of BC's emissions reduction plan. It offers the potential of win-win policies that meet multiple economic, social and environmental objectives. Examples include distance-based auto insurance, congestion and parking pricing policies, and expanded public transit and cycling infrastructure. Alternatives around the movement of goods also need fuller consideration, with more cargo being routed via Prince Rupert or to inland container terminals serviced by rail, in order to reduce the volume of trucks moving goods through Metro Vancouver.

Housing and transportation are directly linked. In the urban core, sky-high property values and lack of senior government funding for new social housing means more low- and middle-income people are forced to the suburbs for affordable housing. This in turn has significant implications for transportation, health and the preservation of agricultural land.

The province's forest industry, particularly in the Interior, has boomed due to a temporary surge in logging of pine beetle-infested areas. But the boom is now giving way to bust as mills cut shifts in response to the collapsing housing market in the US. How we manage forests for maximum carbon storage is of vital importance as we attempt to lower our overall greenhouse gas emissions.

The BC government's active promotion of increased oil and gas extraction makes meeting the 2020 emissions reduction targets a harder task. Between 2006 and 2010, subsidies to oil and gas companies could exceed \$1 billion, and these must be rapidly phased out. Perversely, British Columbians have had a lively debate over what constitutes sustainable logging of provincial forests, yet no equivalent with fossil fuel resources. Unlike trees, fossil fuels are non-renewable and a major source of GHGs. Based on current exploitation rates and reliable estimates of remaining natural gas, northeastern BC's supplies will last just 33 years.

Finally, we need to fundamentally re-think our reliance on trade – including our exports of fossil fuels – and our trading relationships. BC engages in substantial international trade, and continues to invest in new infrastructure associated with the transport of imports and exports. But as the cost of energy and carbon-intensive goods and services rises, there will be impacts on foreign trade and industries such as tourism that rely on cheap transportation.

If the public feels that climate change policies are inequitable – that we are not in this together – there is a high risk that their support will wane. We need to build principles of equity and fairness into the design of policies if we are to meet the political challenge of “keeping everyone on the bus.”

BC's move to make climate change a top priority is welcome. However, we must keep in mind that BC is starting from a place where inequality – in terms of incomes, wealth and carbon footprints – has grown in recent decades. A sustainable economy is not one in which people cannot afford a home, or where they struggle to pay the hydro bill. Much attention has been paid to market mechanisms that increase the cost of emitting GHGs. In addition to these, regulatory measures will be required to ensure the most affluent and corporations do not simply buy their way out of making needed changes.

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Introduction: Tipping Points

“Climate change is the greatest market failure the world has ever seen,” according to the 2006 *Stern Review on the Economics of Climate Change*. As a result of human activity, an ever-thickening blanket of heat-trapping carbon dioxide (and other greenhouse gases) is covering the planet, raising global temperature, and causing serious problems. Extreme weather events, in particular, have raised public consciousness of the dire consequences. Talk has shifted from a false debate about whether climate change is happening at all to how close we are to a “tipping point” beyond which humans lose the ability to stop further warming.

Canadians are far ahead of their politicians in understanding the gravity of the problem. Public opinion has already tipped on this issue, and people want bold leadership to implement solutions. Canadians are frustrated with stalling by governments in order to protect entrenched economic interests. Last December, in Bali, a new international commitment was made to address climate change, with two years of negotiations underway to find a successor agreement to the Kyoto Protocol. Despite being one of the worst offenders in terms of per person emissions, Canada failed to take a leadership role in Bali and was heavily criticized for collaborating with the US and Japan to undermine the negotiations.

In BC, however, there is some cause for optimism. The BC government, which only a couple of years ago ignored global warming, is setting targets and timelines for action. While many questions remain unanswered about what substantive policy changes will be enacted to meet the targets, the province is moving in the right direction with a commitment to reduce greenhouse gas emissions by at least one-third by 2020 and at least four-fifths by 2050 (relative to 2007 levels). To date, the provincial government has identified the easy reduction targets, the “low hanging fruit” of change, and aided by its recently-established Climate Action Team, is contemplating further policy responses to meet the 2020 goal, as well as interim targets.

Notwithstanding an ambitious 2020 target, we believe the current crisis provides a unique opportunity for win-win solutions to bridge our social and environmental goals. Innovative ideas and policies are at hand, and there is good reason to believe we can simultaneously improve our quality of life while reducing our greenhouse gas (GHG) emissions. We need to envision what “the good life” looks like in a sustainable, carbon-neutral province. Life in the BC

There is good reason to believe we can simultaneously improve our quality of life while reducing our greenhouse gas emissions. We need to envision what “the good life” looks like in a sustainable, carbon-neutral BC.

of the future will look different, and some of our consumption priorities will, of necessity, change, given the global warming imperative – but our quality of life may in fact improve. In some cases, this amounts to strategically reinforcing positive economic and social changes that are already happening. In others, we need to contemplate structural changes in how we live, work and play.

Meeting our targets will require collective action of the type usually reserved for war. Our concern, however, is that in the rush to action, policy makers will lose sight of how policy affects different groups in society. A sustainable economy is not one in which people cannot afford to buy a home, or where they struggle to pay the hydro bill; nor is it one in which the most affluent simply buy their way out of making

needed changes. If the public feels that policy measures are inequitable – that the load is not fairly shared – there is a high risk that support will wane. Therefore, we need to build principles of equity and fairness into the design of policies to address climate change, if we are to meet the political challenge of “keeping everyone on the bus.”

We must also have a much broader process of public engagement – a new, open and democratic Conversation on Climate Change. Such an exercise would greatly complement the work of the government’s Climate Action Team. To date, BC’s climate planning has been an exclusive and secretive process, with many important groups left out of the conversation entirely. The perspectives of labour unions, anti-poverty groups, and other community organizations – groups who may bear the greatest burden of adjustment – need to be heard and reflected in policy.

In the next sections, we provide an overview of climate change in BC, along with various policy options, and their potential costs and benefits. This will be useful to individuals and groups around BC to evaluate what they see and hear from the BC government in the coming weeks and months. Our primary goal is to set out principles of effectiveness, equity and fairness that we believe are strongly supported by a broad cross section of society, as we move forward in meeting our climate change obligations.

Climate Change Impacts in BC

As the public and politicians have awakened to climate change, scientists are reporting back that our window of opportunity is shrinking faster than we had previously thought. The most recent readings of the Arctic show that ice cover has shrunk faster than even the most pessimistic scenarios of just a few years ago. The danger is now recognized to be avoiding runaway climate change in the form of feedback loops: less Arctic sea ice means more sunlight is captured by the ocean, thereby accelerating the shrinkage of sea ice; the melting of northern permafrost releases methane (natural gas, a major greenhouse gas) into the atmosphere that further abets warming trends.

There is growing scientific consensus that we must do everything in our power to avert a 2°C temperature increase above pre-industrial times (i.e. 200 years ago). Global temperature is already about 0.7° above that level, and because there is a lag between emissions and higher temperature, another 0.5° is likely “locked in” due to the current stock of greenhouse gases in the atmosphere. The implication is stark: deep emissions reductions are required starting immediately.

Sorting Through the Scientific Jargon

Carbon dioxide (CO₂) is the largest source of *greenhouse gas (GHG)* emissions, accounting for four-fifths of BC's total annual emissions. Methane (or natural gas) and nitrous oxide account for much of the remainder, although there are several chemical compounds that contribute small amounts to the total. Many of these greenhouse gases have more global warming impact per unit than carbon dioxide even though their emissions may be smaller. Emissions of other greenhouse gases are often converted into a *carbon dioxide equivalent (CO₂e)* for the purposes of adding up all GHGs.

Like water filling a bathtub, the amount of GHGs in the atmosphere has risen from 280 parts per million (ppm) CO₂e two centuries ago to about 430 ppm today. Annually, 2.3 ppm in GHGs are added to this tub (above and beyond CO₂ that is naturally absorbed each year by forests and oceans). Thus, negotiations such as Kyoto have sought to slow, and ultimately stop, this annual increase. We are not completely sure how high the tub is – many scientists now endorse 450 ppm as an upper limit before rising temperature causes catastrophe.

The process of reducing annual GHG emissions is called *mitigation*. BC has committed to a one-third reduction in GHG emissions by 2020, and four-fifths by 2050. A number of the policy options discussed in this paper – including carbon taxes, cap-and-trade systems and regulatory measures – are about reducing GHG emissions from households and industry. Globally, scientists estimate that GHG emissions need to drop by 80 to 90 per cent by 2050 in order to prevent dangerous levels of global warming. BC's emission reductions will need to be even greater because we are starting from a higher level of emissions per person.

Strategies to address the impact of global warming (for example, extreme weather events) are known as *adaptation measures*. As opposed to simply reacting to events as they happen, adaptation is pro-active and seeks to minimize the risks associated with major damage to property and impacts on human life and health. Examples include building dykes in areas vulnerable to flooding and implementing insurance protection against extreme weather events. These measures do not "solve" the core problem of high and growing greenhouse gas emissions, but instead aim for greater resiliency to the outcomes of climate change.

With this in mind, even as the 2020 targets for BC will be challenging to achieve, there is good reason to believe that the province's 2050 target (GHG emissions 80 per cent below 2007 levels) is not ambitious enough. If we take the 2° limit seriously, and also account for an equal per person amount of emissions on a global scale, BC's emissions reductions by 2050 will need to be around 95 per cent or higher. This effectively means becoming a carbon neutral society – and it will entail a new industrial revolution that decarbonizes the economy.

As we will see in the next section, much of the emphasis provincially has been on reducing BC's GHG emissions, called *mitigation*. But no matter what is achieved in BC and elsewhere through mitigation, we will also need to adapt to a changing climate. In BC and across Canada, there is great uncertainty about degree and timing of change, and impacts will vary greatly depending on location. Overall, it is expected that negative impacts will significantly outweigh any positive ones. In the broadest terms, BC should anticipate:

- Changes in the distribution of water resources, in relation to flooding and drought, drinking water supplies, agricultural needs, energy production, fisheries, transportation, and recreation;
- Potentially positive changes in food productive capacity, offset against greater likelihood of heat stress, pest infestations, and extreme weather events;
- Enhanced forest growth rates in some regions, but offset by forest cover loss in others, as well as further changes including increased fire, insect and disease outbreaks;
- Impacts on fish populations and sustainable harvest levels due to changes in migratory patterns, water temperature and levels, extreme events, diseases and other ecosystem-wide events;
- Deterioration of physical infrastructure due to increased frequency of extreme weather events;
- Rising sea levels, an important issue in the Fraser Delta, the Queen Charlotte Islands, and smaller coastal communities; and
- Impacts on human health and well-being due to heat-related illnesses, vector-borne diseases, and water-borne diseases.²

If we take the 2°C limit seriously, and also account for an equal per person amount of emissions on a global scale, BC's emissions reductions by 2050 will need to be around 95 per cent or higher. This effectively means becoming a carbon neutral society – and it will entail a new industrial revolution that decarbonizes the economy.

These are not just potential consequences in some distant future. Climate change in BC is already apparent. In just the past five years, British Columbians have seen major forest fires associated with excessively dry conditions in the Interior, reduced water reservoir levels after an exceptionally dry winter, and (a couple of years later) a near miss of major Spring flooding

in many parts of the province due to abnormally large snow-packs. According to Environment Canada, the potential economic costs avoided were truly massive:

The Fraser Valley avoided a catastrophe when cooler temperatures returned and a sippy storm diverted away at the last moment, sparing thousands of hectares of farm and residential land, avoiding the evacuation of tens of thousands of residents and saving an estimated cost-loss of \$6 billion.³

To put this into context, \$6 billion is about 3 per cent of BC's annual GDP. Extreme weather events that last a few hours or days also pose extremely large economic costs, as Hurricane Katrina showed the world. In BC, a rash of storms late in 2006 led to economic costs associated with power outages, boil-water advisories, impacts on infrastructure, closure of commercial operations, as well as intangibles like the loss of thousands of trees in parks and on streets. BC must proactively take steps to make communities more resilient to climate-related shocks.

In terms of both mitigation and adaptation, the challenge posed by climate change is immense. But it is not insurmountable. Humans caused climate change and humans can fix it. And if thoughtful policies are put into place there is good reason to believe we can have an improved quality of life at the same time.

Perhaps the most potent impact of climate change is the devastation of the province's forestry resource base to the mountain pine beetle. To date, the economic impact has been more than offset by accelerated cutting in response to the beetle kill. But down the road the potential job losses are staggering, threatening forestry-dependent communities and rural areas. At the same time, the role of forests in carbon sequestration will become increasingly important. A new forest strategy is needed that meets both environmental and economic objectives.

Still another example is the decline of salmon runs, a major concern to Aboriginal communities throughout BC, and others who fish for a living. While numerous factors account for the declines of specific salmon runs, there is mounting scientific concern about the threats posed to salmon both during their lives at sea, and in the rivers and streams in which they spawn, as further warming occurs. Unchecked, climate-related threats to salmon and other fish species will

have profound impacts on traditional ways of life, and in economic terms further diminish the value of fishing rights.

In terms of both mitigation and adaptation, the challenge posed by climate change is immense. But it is not insurmountable. Humans caused climate change and humans can fix it. And if thoughtful policies are put into place there is good reason to believe we can have an improved quality of life at the same time.

A Review of BC's Climate Action Plan

In the February 2007 Throne Speech, the BC government announced it will reduce greenhouse gas emissions by at least 33 per cent below 2007 levels by 2020, and in the Fall of 2007, the government announced a target of reducing GHG emissions by 80 per cent by 2050. These have now been put into legislation, although major questions remain about accountability, transparency, and monitoring and enforcement.

The easy measures for emissions reductions have been identified and announced, and the government claims these policies will go 60 to 80 per cent of the way towards the 2020 target (although these have not been verified).⁴ A Climate Action Secretariat has been established to coordinate this process, and a Climate Action Team (CAT) has been tasked with recommending additional means of meeting the 2020 target, as well as short-term emissions reduction targets for 2012 and 2016 (the CAT will present its recommendations by the end of July 2008). BC has also joined the Western Climate Initiative, a regional program to coordinate climate policies among six US states plus the province of Manitoba.

Summary of BC Government Climate Change Policy Initiatives

The following are provincial policy measures that have been announced and proposed, as of January 2008. Many of these have yet to be legislated or implemented.

Transportation

- Reduce emissions from vehicles through adoption of California's proposed tailpipe emissions standards, a low-carbon fuel standard, anti-idling measures, and an extension of a tax exemption for hybrid cars.
- Reduce vehicle travel through public transit (including a new multi-year \$11 million infrastructure plan) and alternative modes of travel (such as cycling and HOV lanes).
- Electrification of ports and truck stops.

Buildings

- Plan to develop a new BC Green Building Code. All new provincially owned or leased facilities will be built to a minimum of LEED gold or equivalent criteria.
- Incentives for energy retrofits to be made available for existing buildings. Energy audits will be encouraged and facilitated.
- Green schools, hospitals, ferries, airports and prisons will be developed.
- Energy efficiency standards for appliances and equipment (including Energy Star) will be updated. BC to have the highest energy efficiency standards in Canada.
- Targets for energy efficient lighting will be set with BC Hydro.
- A 100,000 Solar Roofs program.

Urban Planning

- Local governments will be encouraged to develop "green communities" through reduced transportation needs and increased energy efficiency.
- GHG emissions reduction strategies and targets will be legally required in all official community plans and regional growth strategies.
- Municipalities will be given the power to waive development cost charges as a way to encourage green developments, small unit houses, and small lot subdivisions.

Electricity

- BC Hydro to install a smart electricity grid and assist all residential and commercial customers to install Smart Meters.
- Net zero GHG emissions target for electricity in the province by 2016. This includes a commitment by BC Hydro to a 50 per cent conservation target, a commitment to 90 per cent clean power, and a standing offer for small power projects.
- A \$25 million Innovative Clean Energy Fund to help commercialize new alternative energy technologies.
- Phase-out of incandescent light bulbs by 2012.
- Clean power and bio-energy to be encouraged by BC Hydro. The province will seriously consider the development of Site C as a new source of large-scale energy production.

Fossil Fuel Industry

- Routine flaring at oil and gas wells and facilities to be eliminated by 2016 and reduced by 50 per cent by 2011.
- Throughout the entire oil and gas industry, GHG emissions will be reduced to 2000 levels by 2016.
- Carbon sequestration will be required for any coal-fired electricity project in the province.

Other Major Industry

- A cap-and-trade system to regulate industrial GHG emissions is being developed in coordination with the Western Climate Initiative. This will require the establishment of caps for individual facilities, and rules for trading and offsets.
- An industrial energy efficiency program and a best available economically achievable technology policy for new non-energy related facilities to be developed.

Other

- New requirements for methane capture in landfills.
- Diverting organic matter from landfills.
- A \$100 million, 10-year fund to support dykes and flood prevention measures.
- Provincial public sector operations to be carbon-neutral by 2010 (actual emissions reduction measures, with the difference purchased through carbon offsets).

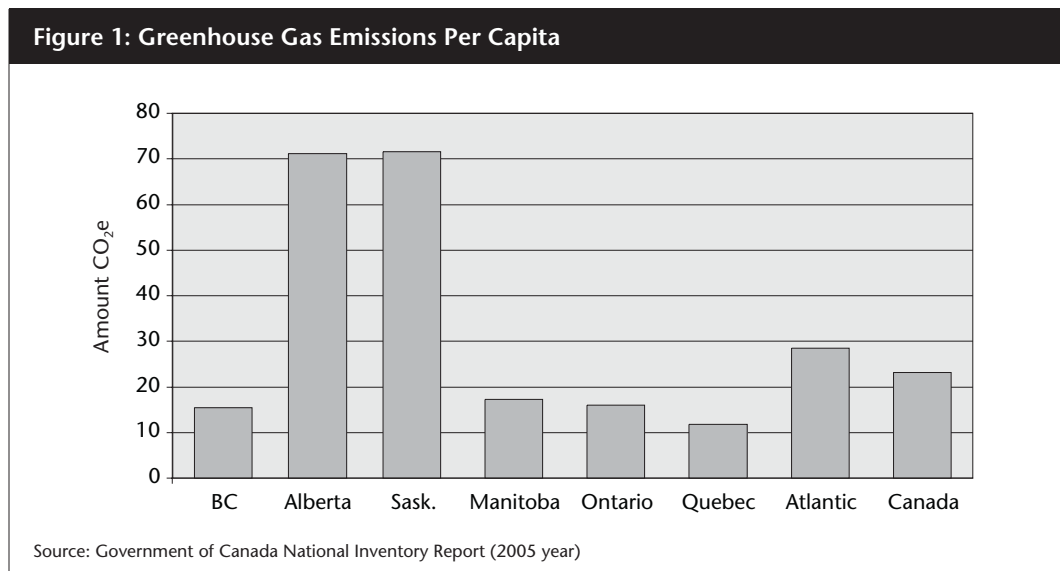
Source: Government of British Columbia, 2007

Figure 1 shows that BC's emissions per capita in 2005 (15.5 tonnes) were 33 per cent lower than the Canadian average (23.1 tonnes), with only Quebec among the provinces with lower per capita emissions (11.8 tonnes). Much of this difference is due to the fact that BC's electricity is mostly derived from hydroelectricity that does not have any associated GHG emissions. It also means that in meeting the 2020 and 2050 targets, BC cannot rely on large reductions from this sector, unlike Alberta, Ontario or other provinces where coal-fired plants are common.

The pattern of BC's emissions suggests meeting our GHG targets is fundamentally incompatible with two major policy priorities of the provincial government. The first is the growth of the oil and gas sector. The second is the Pacific Gateway Strategy.

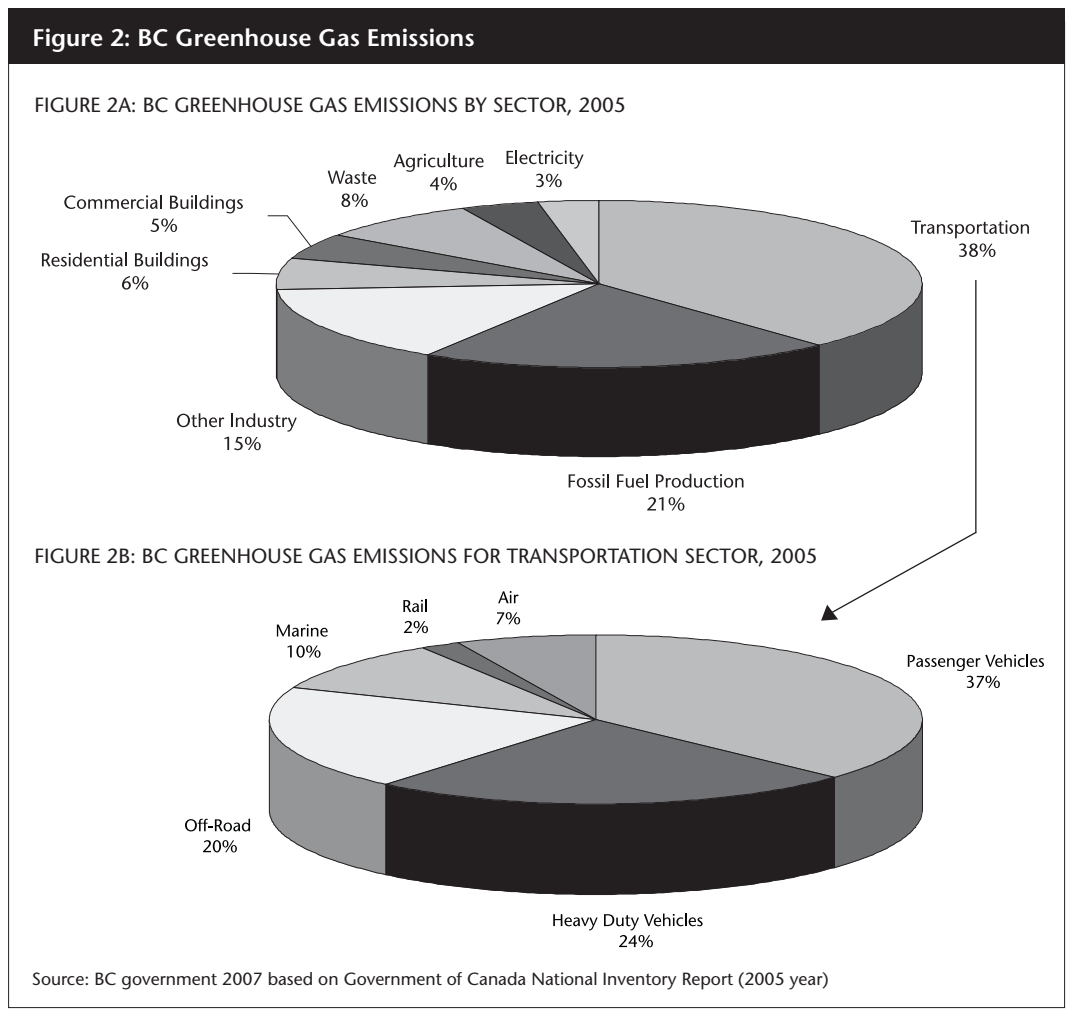
Other industrialized countries, however, have much lower per capita emissions. These countries have been reducing their emissions in compliance with the Kyoto Protocol, while Canada (including BC) has let emissions soar despite being a signatory. Among nations, Canada is among the worst offenders, with per capita emissions similar to the US, about double that in Europe (10.6 tonnes) and five times that of China (although China has one of the highest level of *total emissions* due to its 1.3 billion population). Some countries perform even better without sacrificing quality of life or economic performance (Sweden, for example, has GHG emissions of 7 tonnes per person).

The single largest source of BC's greenhouse gas (GHG) emissions is from transportation, accounting for nearly two-fifths of BC's total emissions (Figure 2a). Personal mobility contributes 37 per cent of the total for transportation, or about 14 per cent of total BC emissions (Figure 2b).⁵ Fossil fuel industries (21 per cent of the total) and other industrial emissions (15 per cent) are also significant contributors. Electricity generation is a comparatively small contributor (3 per cent) to GHG emissions.⁶ Between 1990 and 2005, BC's total emissions grew faster than for Canada as a whole (30 per cent in BC compared to 25 per cent nationally), with emissions related to oil and gas production leading the way (roughly double 1990 emissions in 2005).⁷



The pattern of BC's emissions suggests meeting our GHG targets is fundamentally incompatible with two major policy priorities of the provincial government. The first is the growth of the oil and gas sector, which alone accounts for more than one-fifth of BC's GHG emissions. One notable initiative, however, is a commitment to eliminate flaring, whereby energy companies burn off usable natural gas rather than direct it into pipelines. However, the fine print calls only for the elimination of "routine flaring," defined as that which is economically recoverable, and thus the actual reductions from this measure are much more modest.⁸

The second is the Pacific Gateway Strategy that aims to expand road infrastructure in Metro Vancouver and twin the Port Mann Bridge. Because personal transportation (road and air) accounts for 14 per cent of BC's GHG emissions, this refusal to revisit Gateway is highly problematic, and if anything locks in an unsustainable pattern of sprawling suburbs and commuters in single-occupant vehicles. Such development also poses threats to agricultural land, witnessed by recent applications to remove land from the Agricultural Land Reserve on the fringes of Metro Vancouver. In January 2008, a major mass transportation initiative was announced that will expand transit infrastructure between now and 2020. While this will help reduce some emissions (though not a huge amount), more such initiatives are required to provide commuters with an alternative means of getting to work, or to provide affordable housing closer to work.



As mentioned, the new Climate Action Team will consider emissions targets for BC and policy measures to get there. However, this process fails to include key constituents, including a broad range of community health and social service, voluntary, educational, and faith-based organizations, rural communities, the labour movement, anti-poverty groups, cultural communities and immigrant groups, as well as the general public. Thus, important perspectives are not being heard at the CAT table. Furthermore, once the CAT reports at the end of July 2008, it is not clear how its recommendations will translate into actual policy.

We must also have a much broader process of public engagement – a new, open and democratic Conversation on Climate Change. To date, BC’s climate planning has been an exclusive and secretive process, with many important groups left out of the conversation entirely.

While there is merit in an expert review of options for policy and targets, even if the CAT was more broadly representative, there are connections that can and should be made with the general public through a more comprehensive process. BC has recent experience with more deliberative democratic engagement. First, the Citizens’ Assembly on Electoral Reform is a model that engages BC citizens, rather than elites, to directly grapple with problems and come up with recommendations. Second, the Conversation on Health engaged citizens around the province on a variety of policy issues regarding the public health care system. While the Conversation was widely criticized as a cynical exercise, this form of consultation need not be if the outcomes are translated into action.

In both deliberative models, there are likely to be advantages in assessing which policy options are the most politically feasible, and whether there may be unintended consequences.

The answers to policy questions must be better attuned to where real people are at in terms of willingness to make changes in their lifestyles. Thus, to complement the actions of the CAT, the government should lead by engaging citizens through more deliberative processes, as it has done in the past on other issues of importance to British Columbians.

The Inequality Challenge

At the recent Bali international climate change conference, inequality was front and centre because of the highly unequal distribution of the benefits and costs from the burning of fossil fuels. The poorest countries, which did little to cause the problem, are nonetheless the most vulnerable to climate change impacts, while having the least ability to adapt. Rich countries, on the other hand, bear most of the responsibility for the problem, and need to play a disproportionate role in solutions.

While the relative impact on rich and poor countries is of fundamental importance, a neglected issue is the distributional impact *within* nations like Canada or provinces like BC. Climate change impacts will differ depending on personal endowments of wealth, geography, consumption and transportation patterns, industry and occupational category. Similarly, policy responses arrive in a local context where the existing pattern of distribution matters a great deal. Policy may make inequality worse – if we do not actively build principles of equity and justice into our planning at an early stage.

BC is a prosperous province, but one characterized by astonishing inequality in terms of income and wealth. Tax and census data point to rising income inequality in recent decades, whether measured by market income or after-tax-and-transfer income.⁹ At the top, incomes have grown relative to the middle, while the incomes at the bottom have fallen relative to the middle.

Furthermore, BC's economy has been characterized by the persistence of poverty and growing homelessness:

- Greater Vancouver saw a doubling of homelessness between 2002 and 2005, and one estimate, based on losses of affordable housing units for the poorest, was that homelessness could triple between now and the 2010 Olympics.¹⁰
- BC poverty rates exceed national rates in every demographic category in spite of both stronger economic growth rates and lower unemployment rates. The situation is most acute for lone mothers, with half living in poverty.¹¹
- In terms of labour markets, one in five British Columbians earn less than \$10 an hour, and nearly half of them are over age 25.¹²
- Provincial policy has exacerbated the situation through regressive changes to social assistance policies (in particular, to eligibility requirements) between 2002 and 2004.¹³

Moreover, there is inequality associated with our carbon footprints. A forthcoming CCPA study by Hugh Mackenzie and Hans Messinger looks at the ecological footprint by decile groupings (while not exactly the same as GHG emissions, there is a close correlation). They find, for Canada as a whole, that the top decile has an average footprint two-and-a-half times the size of the bottom decile. The pattern is worse for personal mobility (i.e. transportation) with the footprint of the top 10 per cent nine times greater than the bottom 10 per cent. They conclude that the most affluent have a disproportionate burden of responsibility to reduce their footprint, but that they are also the most likely to seek to pay higher prices to avoid behavioural change.

On the mitigation side, there are some basic questions about what is fair in policy terms when it comes to climate change. Should we aim for an equal percentage reduction in emissions? Or an equal per person reduction? Or should emissions be reduced in line with a common per person entitlement to emit greenhouse gases? These questions should guide us as we think about proposals such as a carbon pricing and carbon quotas to avoid unintended or adverse distributional impacts.

The academic literature on ethics and environmental justice broadly supports the principle that all people should have an equal right to emit greenhouse gases, subject to an overall cap. The literature also calls for preferential treatment of the most vulnerable. There are also broader considerations, such as the historical liability for past and current emissions, suggesting that those who have most benefited from burning fossil fuels should bear the greatest burden of adjustment.

All policies to tackle climate change need to be viewed through a social justice lens. For example, some recent federal climate policies, while positive steps, also have some largely unrecognized distributional effects. For instance, the 2006 public transit tax credit is non-refundable, and thus cannot be accessed (or only partially accessed) by many people who do not have sufficiently high taxable incomes. Similarly, the rebate policy for purchases of hybrid cars provides a tax benefit to middle and high-income people, but is not an option for those who cannot afford to buy and maintain a new car.

The impact of adaptation policies on vulnerable populations should also be top of mind. Low-income people will have the least capacity to adapt in a world where endowments of wealth and access to decent income matter. For example, while affluent families can self-insure against unforeseen circumstances like extreme weather events, low-income people have fewer resources. Publicly-provided forms of insurance (unemployment insurance, social assistance, public health insurance) are crucial. Extreme weather events point to other challenges: the 2006 Vancouver boil-water advisories, for example, led to conflict over limited bottled water supplies, and the rapid shift from water as a public good to a private one.

Low-income people are more likely to rent their accommodation, and may also be less aware and less prepared for an extreme weather event – consider the case of New Orleans and its displacement of poor people, with recent reconstruction efforts benefiting more affluent families. Upgrading of housing will require special attention. Many low-income people are renters rather than owners and have little ability to make investments in household energy efficiency. Even if they are paying the monthly electricity or natural gas bill, because they rent they do not have the same incentive to make upgrades for energy efficiency. Even for low-income homeowners, taking action that would reduce their future risk and costs may not be possible due to budget constraints. Public sector responses to reduce the cost of upgrades, through subsidies and rebates, should be considered to accelerate the diffusion of green investments. And ultimately a large-scale housing retrofit program for low-income housing will be needed.

Adaptation for vulnerable populations also overlaps with public health initiatives. Increases in temperature will lead to longer and more intense heat waves, for example, with impacts for outside workers, seniors, and people with respiratory problems. Other health status and public health concerns include threats to water supplies, airborne pollutants, and infectious diseases. And in the broadest terms, whole communities are vulnerable, particularly those with high levels of dependency on resource industries that will be affected by global warming.

These issues point to inequality in another dimension – quality of life (or life satisfaction) – that may not be well-captured by standard indicators of income, consumption or wealth. The literature on “the economics of happiness” finds that above certain basic levels of income or consumption, there is little increase in measured life satisfaction, a finding that has important implications for how we consider policy impacts. An overarching objective should be to reduce inequality in terms of life satisfaction, not just differences in income (although for low-income people, higher incomes directly translate into higher quality of life). At the aggregate level, growth in provincial GDP per person does not necessarily tell us much about changes in quality of life.

Many low-income people are renters rather than owners and have little ability to make investments in household energy efficiency. Even for low-income homeowners, taking action that would reduce their future risk and costs may not be possible due to budget constraints.

A Look at the Climate Policy Toolbox

In this section, we outline the major policy tools that may make up BC's response to climate change: carbon pricing, regulation, and innovation strategies. In the next section we slice the policy issues in a different manner by looking at urban centres, rural areas and BC's links to the rest of world. We have attempted to put these issues through a social justice lens, although our analysis is not comprehensive. More research is required to better assess where such initiatives may already be in play, their successes and failures, and how and whether such approaches can be implemented and expanded in the BC context.

The major questions for different policy options are: first, are they effective in bringing about the type of change we require (meaning, will they lead to lower overall emissions); and second, what are the impacts on different population groups and regions of the province (meaning, will they reduce or exacerbate inequality). Another dimension to consider is overall quality of life impacts, rather than just income or consumption changes. Ideally, measures that address climate change can and should lead to improvements in quality of life.

Ultimately, a bold, effective and equitable climate change plan will require a mix of all these tools – effective regulation, carbon pricing, just transition plans for affected workers, industrial strategies, and large-scale public programs. No one solution will get us where we need to go; a full suite of tools will be required.

Carbon Pricing and Caps

Currently, households and businesses pay nothing when they emit carbon dioxide and other greenhouse gases into the atmosphere. The object of carbon pricing is to make it increasingly expensive to do so. In essence, carbon pricing is about ending the use of the atmosphere as a “free” dump. Any activity that emits GHGs will thus become more costly, and in responding to higher costs consumers will be encouraged to make environmentally-friendly purchases.

Higher prices would encourage industry and households to invest in new equipment and technology (low emission vehicles, home retrofits, sequestration technology, etc.) that would allow them to avoid or minimize the extra cost of carbon emissions. A good example is the innovation around fuel efficiency, especially in smaller and more fuel-efficient vehicles, that occurred in the 1970s and 1980s in response to a ramp-up in oil prices. Some movement is already occurring due to today’s high fuel prices, although slow progress suggests some areas, such as transportation, would require very large price hikes in order for behaviour to change in a meaningful way.¹⁴

A key shortcoming of relying on carbon pricing is its distributional impacts; as the price of carbon-intensive goods and services rises, lower-income households will feel the impact of higher prices more intensely. A market-based carbon pricing approach can worsen inequality, if unaccompanied by deliberate measures or policy design that addresses income distribution.

Two stylized variants of carbon pricing are frequently invoked – carbon taxes and cap-and-trade systems – with multiple versions of each.

- *Carbon taxes* are like a sales tax on carbon-intensive goods and services. Carbon taxes are advocated because they are relatively easy to administer, and give greater certainty about what prices will be. Proponents generally argue that the price should start low and be raised gradually over time to minimize adverse economic impacts. A predetermined schedule of carbon tax increases would hopefully stimulate innovation and behavioural changes in advance of the actual tax increase. A shortcoming is that they do not directly determine the quantity of emissions, as people and companies will have to assess whether to change their behaviour or pay the tax, and thus it remains an open question as to how effective a carbon tax will be, particularly at lower levels.¹⁵
- *Cap-and-trade systems* work differently. They set a cap on the overall quantity of emissions, and after allocating rights to emit carbon, then let the market determine the price. How permits are allocated matters a great deal. The European cap-and-trade system for industrial emitters has been highly criticized because it gave the biggest polluters the most permits. For this reason, many observers now argue that emission permits should be auctioned, not given away. An additional benefit is that this would allow governments to capture revenues – similar to a carbon tax – that could then be recycled back to households in some form. Cap-and-trade is the preferred method of most governments for addressing emissions reductions for large industrial emitters.

At a household level, authors like George Monbiot argue for a similar rationing system: emission rights in the form of per person *carbon quotas*. Redistribution is inherent in this model, as intensive emitters (primarily the rich) would have to pay low emitters (mainly the poor) in order to emit more than their allocated share. Elaborate versions of this idea exist that essentially create a new quasi-currency based on emission rights, with a digital infrastructure similar to debit card transactions. This is an intriguing alternative model to a carbon tax for households.

Whether carbon tax, cap-and-trade, carbon quotas, or some mix of them all, the result will be higher prices for consuming goods and services that emit GHGs. For example, a \$30 per tonne carbon tax (as the CCPA's *Alternative Federal Budget* has recommended) amounts to an additional seven cents per litre of gas. Based on the available modeling of emissions reductions in response to carbon pricing, the price of emitting GHGs would eventually need to be very

high in order to be effective. The report of the National Round Table on the Environment and the Economy estimated the magnitude of tax required to meet certain targets. Their scenarios start modestly with a \$10 per tonne of CO₂ tax in 2010 then scale up at different rates. To attain the federal government's stated 65 per cent reduction target by 2050 (a target that is, as noted earlier, too low), the required size of the tax is between \$270 and \$350 per tonne.¹⁶ (By comparison, the federal Green Party is calling for a tax of \$50 per tonne, with a potential increase to \$100 per tonne by 2050.)

Thus, relying on a carbon tax alone will not be sufficient, given the deep reductions required in such a short timeline. Tough regulatory measures will also be needed, including a hard cap on total emissions (with the cap decreasing over time until our targets are met).

Much higher prices mean we also need to carefully consider distributional issues. Market prices are about determining who is willing to pay for a scarce good. This means the poorest in society (and perhaps a sizable share of the population depending on the activity) could get priced out. Like sales or consumption taxes, carbon pricing will be regressive – low-income people will pay a greater share of their income to the associated increase in consumer prices.

What really matters, however, is where the money goes and how it is used. Approaches where government captures the revenue are appealing, as these funds can be used to offset regressive impacts and to reinforce green behaviour. There is ample evidence from Nordic countries that regressive taxes can lead to progressive outcomes – if the proceeds are spent in a progressive manner. In other words, a carbon tax or cap-and-auction, with progressive spending of revenues, could become a Nordic-type strategic bargain that addresses both ecology and equity.

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Revenues can be “recycled” in three broad ways:

- i. Reduce other taxes on income, sales and payrolls (known as “tax shifting”), and/or reduce transit fares;
- ii. Provide a direct income transfer to households (on a per-person basis, targeted to low-income households, or phased out as income rises); or,
- iii. Make direct expenditures on green initiatives like public transit, home retrofits and basic research on alternative technologies.

More research is required to identify the optimum mix across these options. Two recent studies from the US model recycling of revenues to fund per-person income transfers, and find that this turns a regressive tax into a progressive outcome.¹⁷ Similarly, the CCPA's *Alternative Federal Budget* proposes recycling a large share of carbon tax revenues by creating a green refundable tax credit, similar to the GST tax credit, gradually phased out starting at a household income of \$70,000. The remaining revenues are used to finance complementary environmental initiatives, including a just transition strategy for workers, energy efficiency measures and public infrastructure investment, to reinforce emission reductions.

Regulatory Measures

Many advocates of carbon pricing tend to dislike regulatory approaches, while others want tough regulation and are skeptical of carbon pricing. But carbon pricing and regulatory measures should not be pitted against each other. Ideally, they would work in concert with each other, and many measures, such as cap-and-trade or carbon quotas, are effectively a combination of regulation and carbon pricing. Given the magnitude of the challenge, all policy options should be on the table.

The recent report to the federal government from the National Round Table on Environment and Economy fully endorses carbon pricing, but adds that:

[T]here will be a need for complementary policies to attain further emission reductions by 2050; specifically regulatory mechanisms that will force GHG emission reductions from parts of the economy that may not respond to a price signal. These gaps arise through the following:

- *market failures and other barriers that reduce the responsiveness of certain sectors to changes in emission costs – particularly in the transportation and building sectors – and some consumer markets such as vehicles, houses and appliances; and*
- *emissions from sectors of the economy not covered by the broad price signal, including agriculture, forestry, waste and portions of the upstream oil and gas extraction system (such as fugitive emissions of methane from oil and gas wells and coal mines, and gas leaks from pipelines).*

The BC government has already announced some important regulatory measures, including banning incandescent light bulbs by 2010, establishing tailpipe emissions standards for cars, implementing new “green” building standards, and requiring carbon sequestration for new coal-fired power plants. But much more will be needed. Keeping BC on its emissions reduction path will require the right balance between market-based mechanisms and regulatory measures. One challenge that may arise with regulatory policies is that costs will still be passed along to households, but without providing the revenues to government to offset regressive impacts.

Of note, the BC-Alberta Trade, Investment and Labour Mobility Agreement (TILMA) could prove to be a thorn in the government’s side, undermining BC’s ability to take necessary measures on the climate change file. The basic problem is this: fighting climate change will necessarily involve a lot of regulation, while TILMA is fundamentally a deregulatory initiative (highlighting another inherent contradiction in the government’s policy agenda). TILMA creates and codifies investor rights, and provides a mechanism for private enforcement. TILMA’s private dispute panels can award up to \$5 million to an Alberta investor if a decision made by a BC government body “restricts or impairs” their investment. Yet, almost every environmental regulation restricts or impairs someone’s investment. A bold restructuring of BC into a carbon-neutral economy will almost certainly affect the profits of Alberta’s oil patch.

TILMA does provide an exemption for promoting renewable and alternative energy. This is helpful, but falls far short of what will be required. According to an analysis by Ecojustice, more contentious policies that impose costs on manufacturers, such as automotive tailpipe emission requirements or mandated use of carbon capture and storage, might be open to challenge. In these cases, the government would have to prove that these were legitimate measures to protect the environment and that they were not “more restrictive than necessary” – a clause that will give Alberta investors plenty of wiggle room for legal challenges.

In the end, under TILMA’s rules, tribunals of corporate trade lawyers (not judges) will have an opportunity to second-guess democratic decision-making. Ultimately, policy-makers should not have to strain to make a challenging climate action plan fit within the narrow legal confines allowed by TILMA. If there is indeed conflict between the investment liberalization objectives of TILMA and good public policy to achieve our climate change goals, the latter should prevail.

Innovation, Industrial Policy and Just Transition Strategies

The need for BC to reduce GHG emissions, eventually on the order of 95 per cent in coming decades, and to adapt to climate change, ultimately amounts to a new industrial revolution. Strategic leadership from the BC government holds the potential to not only meet the challenge for domestic purposes but to catalyze innovation and the overall economy. To this end, a coherent industrial strategy needs to be developed for the province, including new technology development and diffusion.

There are many opportunities to reduce our energy needs through energy efficiency initiatives. The United Nations estimates that industrialized countries can become 25 to 35 per cent more energy efficient in the next 20 years at no net cost.¹⁸ A great deal of adjustment can occur over time due to turnover in the stock of physical capital in the economy, an opportunity to replace carbon-intensive machinery, equipment and buildings with low- or zero-emission next generation technologies.

In some respects, a more sustainable world and economy is easy to envision. Energy use can be decreased through a variety of means: by continuing to improve the technologies used in industrial processes; by changing how we heat, cool and insulate our homes, businesses, and public spaces; and by changing how we move people and goods. Many renewable energy technologies – including earth energy technologies, wind and tidal power, producing ethanol from biomass, and solar power – could be viable today. Societal commitment, and perverse subsidies to fossil fuel industries are the major obstacles to their widespread implementation.

Efforts to improve energy efficiency should be complemented by a strong industrial strategy aimed at the diffusion of existing technologies in existing industries, plus the strategic targeting of new green technologies and power sources as a development area for the BC economy. The means of implementing this include:

- Providing tax credits to companies that invest in industrial energy efficiency and technologies that reduce greenhouse gas emissions;
- Building locally on the federal Industrial Research Assistance Program (IRAP), a successful program that supports the diffusion of new technologies to small and medium sized enterprises, to cover a range of environmental technologies and applications; and,
- Significantly expanding the funding available for the development of new environmentally-friendly technologies, power sources and applications. New money for environmental initiatives could also be raised by diverting existing subsidies away from fossil fuel industries.

One important challenge of addressing climate change will be the transition from an economy that is heavily reliant on fossil fuel use to one that gradually focuses more on emerging industries – energy efficiency/conservation, renewable energy, and zero emission (or high fuel efficiency) vehicles. While recent analyses reveal opportunities for positive economic gain, this transition will mean shifts in the types of jobs available. Energy workers in particular are vulnerable to job losses. Over the 1990s, the Canadian energy sector shed over 80,000 jobs, despite increased production and increased exports.

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Meeting our climate change targets will mean job losses in some sectors and job gains in others. Those who do lose their jobs must be given options, particularly in related sectors experiencing overall growth. Transition programs for displaced workers have been successfully implemented in the US and Canada, but only when these programs are developed up-front. The elements of a successful just transition program include:

- Training and education opportunities that allow workers to upgrade their skills for the jobs being created;
- Early notice of layoffs, whenever possible, so that workers can access job counseling and training/education programs quickly;
- Income support for displaced workers for up to three years – depending on time in the energy workforce – to enable workers to take advantage of training and education opportunities;
- Peer counseling to assess workers' needs, and analysis of labour market needs; and,
- Relocation funds for those who must move in order to find new work.¹⁹

Sustainable Communities and BC's Quality of Life

In this section, we review the social justice issues associated with both mitigation and adaptation in relation to geographic location: urban development, rural areas and the all-important resource industries, and BC's relationships with neighbouring jurisdictions and the rest of the world. Each area has its own challenges and policy options as we contemplate the good life in a sustainable British Columbia. Connections across these areas, such as the desire for food security in urban areas in relation to rural agriculture, are also important.

Urban Development

Most British Columbians live in urban centres, and about half live in the Metro Vancouver area. Any major climate change plan will thus have urban issues front and centre, including land use, waste recycling, transportation, affordable housing, and energy consumption. Certain locales will also need to grapple with unique challenges, such as in the arid Okanagan, where growing cities like Kelowna will have to address the allocation of water resources.

Land use decisions have a long lifetime (additions to commercial or residential housing stock, and transportation infrastructure have impacts spanning decades). What we build today will be with us long after the dates established for major emissions reductions. Thus, we need to ensure a carbon footprint much lower than present standards. We also need to consider the relationships among competing land uses: building affordable housing in the suburbs versus maintaining a stock of agricultural land; and, tensions between housing needs and commercial/industrial uses in the city.

Transportation, as a major source of GHG emissions, must be at the centre of BC's emissions reduction plan. This includes personal transportation and commuting, but also goods movement and commercial/industrial uses. In the NRTEE modeling, transportation was the last sector to respond to rising carbon prices, suggesting that many complementary policies need to be implemented.

On the other hand, transportation offers the potential of “win-win” policies that meet multiple economic, social and environmental objectives. These include pay-as-you-drive pricing (i.e. distance-based auto insurance), congestion and parking pricing policies, and expanded public transit and cycling infrastructure.²⁰ These and other measures, such as reducing transit fares, must be vigorously pursued to radically increase the mass transit network, its efficiency and rider friendliness in BC's main urban centres. Alternatives around goods movement also need a fuller consideration, with more cargo being routed via Prince Rupert or to inland container terminals serviced by rail, in order to reduce the volume of trucks moving goods through the Metro Vancouver area.

January's announcement of \$11 billion in transit infrastructure upgrades is a big step forward. This new plan is in striking contrast to the Pacific Gateway initiative, which will encourage more housing development up the Fraser Valley, and will serve to lock-in unsustainable patterns of car-dependent development and sprawl. In his address to the Union of BC Municipalities in September 2007, Premier Gordon Campbell remarkably argued that Gateway was part of the government's climate change strategy, as it would reduce travel times and therefore congestion. But as the Seattle-based Sightline Institute points out in a report on highway expansion, reductions in emissions from greater capacity are very short-lived, and before long will be swamped by the increase in emissions arising from more cars on the road. Emissions increase by 100,000 tonnes over 50 years for every mile of highway constructed.²¹

The intersection between housing and transportation is also important. In the urban core, continued rising property values and the disappearance of senior governments in the funding of new social housing may force greater numbers of low-income people to seek affordable housing in suburban areas, a development that has significant implications for transportation and preservation of agricultural land.

The closer people live to work, the more likely they are to walk or cycle (which also has beneficial health impacts). Such “smart growth” ideas attempt to reduce private vehicle trips through more compact community development, mixed-use neighbourhoods, and greater transit options. This also means conscious planning efforts to develop a wide range of affordable housing types and options in Metro Vancouver. In areas like Whistler, where these pressures have been more acute, new developments are already required to contribute a percentage of units to the city’s stock of “workforce housing.”

As part of its climate change strategy, BC is right to push for a new “green” building code and incentives for retrofits. But BC must also take measures to challenge unsustainable land use patterns of housing development. And any action strategy must ensure truly mixed communities in terms of housing types and tenure, and avoid gentrification. The City of Vancouver’s EcoDensity plan, which seeks to reduce the footprint of urban living, is of particular interest. A neglected issue for EcoDensity surrounds how best to provide a growing stock of affordable housing. To be truly sustainable, municipalities should consider alternative policies, such as:

- Ensuring a certain percentage of suites in major new developments is dedicated as “affordable”;
- Accelerating neighbourhood intensification (e.g. laneway homes, duplex/triplexes, and secondary suites) through public seed funding if the resulting unit(s) are made available on an affordable basis; and,
- Implementing a major build-out of more traditional forms of social housing (using the latest energy efficiency standards).

Because of the important role of municipalities in making change happen at the local level, we also need to contemplate fiscal reforms that will provide the requisite funding base so that transportation, affordable housing and other neighbourhood/community development projects can happen. This may include dedicated shares of income or sales taxes, or other transfer mechanisms from senior governments. Regional governance and financing of transportation is also of great interest given the recent provincial restructuring of Translink.

Transportation offers the potential of “win-win” policies that meet multiple economic, social and environmental objectives. These include distance-based auto insurance, congestion and parking pricing policies, expanded public transit and cycling infrastructure, and reduced transit fares.

Rural BC and Resource Industries

The character of solutions to climate change in rural parts of BC will not necessarily be the same as in major urban areas. For households, transportation and home heating are two major areas where differences in policy will need to be considered. Some pressing issues exist for Aboriginal people in BC, in terms of access to, and control over, forestry and other resources, sources of energy (many isolated communities rely on diesel fuel), and adaptation in some of the poorest communities in the province.

The role of BC's resources is the single more important difference from urban areas, in particular for key industries such as electricity generation, oil and gas, and forestry. Resource industries continue to be significant contributors to the BC economy, and provincial treasury, although their fortunes ebb and flow with commodity prices. Climate change adds another layer of complexity to the relationship between resource industries and the communities that depend on them.

Agriculture

While a major source of income in rural areas, agriculture is an important linkage to urban centres from a food security perspective. Climate change could alter transportation patterns with respect to food, and supply chains could be vulnerable to extreme weather events. There are still risks associated with BC agriculture – even though warming may lead to a longer growing season on average, there is heightened risk associated with extreme weather events, or outbreaks of pests, that could destroy or diminish crops. This highlights the need to ensure adequate food supplies to consumers, and to spread the risk of catastrophic losses for farmers.

BC has great potential to be a world leader in developing an alternative approach: a safe, healthy and relatively self-sufficient food system. While BC currently produces about 60 per cent of its food requirements, it is estimated that this figure could rise to 85 per cent. One bedrock element of an alternative approach must be preservation of the 4.7 million hectares that constitute the Agricultural Land Reserve (ALR), which amounts to about 5 per cent of BC's total land area. If prime agricultural land gets converted into suburban sprawl, our dependence on food imports in the future will be all the greater (and would likely mean higher emissions, given the transportation involved).

In many parts of Canada, small family farms are under threat from large-scale corporate farms and the abandonment of programs designed to ensure stable and family-sustaining farm incomes. In BC, this threat looms large, although BC's rugged geography and fragmented land base make the province less conducive to corporate farms. More than 90 per cent of the province's 22,000 farms are still family-run.

The market for organic produce is now the fastest growing segment of the food industry. In terms of mitigation, this means a much smaller carbon footprint due to the non-use of petrochemical-based fertilizers. Organic production in BC has grown to more than 500 farms. BC is far ahead of other provinces in the amount of land being devoted to organics, with organic production

representing 8.7 per cent of the vegetable area and 3.2 per cent of the fruit area of the province (as of 2000). However, even in the organic sector, BC currently supplies only 10 per cent of the organic produce sold in the province.

BC can also build on a number of alternative distribution networks to reach consumers. These include farmers' markets, organic home delivery services, specialty retailers, and Community Shared Agriculture (CSA) initiatives (where urban dwellers purchase shares in crops grown on organic farms). At the same time, governments must commit to a system that ensures the viability of small, family-run farms, encourages organic farming practices, and produces the high quality foods that consumers want.

Electricity Generation

Given the need for clean and green power, BC Hydro should be a major player. Unfortunately, the provincial government's 2002 decision to turn BC Hydro into only a purchaser of new energy, rather than a supplier of new energy (i.e. BC Hydro is not allowed to build new generating capacity), means that any new energy supplies for the province must come from private power producers. (This policy may, in the end, be revisited for the development of Site C on the Peace River, a historically controversial mega-project now being reconsidered.)

This has led to some perverse outcomes in the development of micro-hydro generation projects. Because BC is rich in water resources, small run-of-the-river hydro projects that generate electricity using a renewable, non-polluting energy source are very attractive. The number of prime sites for small hydro is limited due to geography, energy capacity, transmission access, Aboriginal land claims, environmental suitability and potential alternative community and public uses.

Yet, the government has virtually given away the water rights to what is perhaps the most valuable of BC's renewable resources. Assets worth future revenue streams involving literally billions – perhaps tens of billions – of dollars over the coming decades are being sold for a few tens of thousands to those who are first in line to acquire them. The government is encouraging private energy interests to lock in effective ownership of the most promising hydro power sites across the province for a minimal water licence fee, extremely low waterpower application costs and minimal water rental charges. More disturbing, all of this is being financed by public money, through BC Hydro's energy purchase agreements. These agreements provide the cash flow that proponents need to construct their power facilities, roads and transmission lines. Almost invariably, the decision about whether a private energy project is viable economically is determined by whether the proponent can get a long-term purchase agreement with BC Hydro.²²

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On a more positive note, the BC government has changed direction on a much-criticized plan to allow the construction of two coal-fired power plants. Under a policy that all existing and new electricity generation be carbon-neutral by 2016, the government will now require 100 per cent carbon sequestration for a coal-fired plant to go ahead. Sequestration involves the use of technology that allows CO₂ and other greenhouse gasses to be stripped from fuels such that when those fuels are combusted, there are no emissions of heat-trapping gasses. The stripped greenhouse gasses are then pumped deep underground (in some cases under the seabed), where there is a strong degree of scientific certainty that they will remain trapped there. This policy must also be applied more broadly – for example, carbon sequestration should be required of the controversial proposed liquefied natural gas plant on Texada Island (if approved at all), which if unabated would increase BC's emissions by almost 2 megatonnes per year.

Forestry

The province's forest industry, particularly in the Interior, has delivered significant economic dividends due to a temporary surge in logging rates due to the massive mountain pine beetle infestation. But the boom is now giving way to bust as mills curtail shifts and close in response to the collapsing housing market in the US, and companies awake to the fact that future timber supplies are in jeopardy due to an ever-increasing stock of dead pine trees. In the future, the intersection among forests, the industry and local communities promises to become more complex and challenging.

Whereas sequestration prevents greenhouse gasses from entering the atmosphere, trees actually pull CO₂ out of the atmosphere, helping to counteract emissions elsewhere. Thus, they are an incredibly important part of the equation as we move forward in trying to dramatically lower overall emissions. In Canada's managed forest (areas actively managed for timber production) there is enough carbon presently locked up to equal one half of all the greenhouse gas emissions emitted worldwide in the course of a single year. Using forests to help mop up additional carbon dioxide also requires a net increase in tree cover.

In recent years, however, BC forests have been net *sources* of carbon as opposed to net sinks. One of the major reasons for this is the devastating mountain pine beetle outbreak that continues to redraw the face of Interior BC and that threatens to spill over into the pan-Canadian boreal forest. Another major contributing factor for increased CO₂ emissions from forests has been forest fires. Forest fires, particularly those in the far north where lack of road access and distance from airport facilities hampers suppression efforts, can be extensive and result in huge, immediate releases of CO₂ to the atmosphere. Due to generally warmer and drier conditions we will likely see more forest fires in the coming years, particularly in northern climes like Canada.

Given such realities, and the fact that forestry has traditionally been an economic engine of major importance in BC (disproportionately so in rural BC), how we go about managing forests for maximum carbon storage is of vital importance as we attempt to lower our overall greenhouse gas emissions. For example, there may be potential for holding forestlands in trust as a revenue stream due to the need for offsets elsewhere in the economy. This challenge raises many issues, including some fundamental ones about ownership. The First Nations Summit, for example, has staked a counter-claim on the carbon credits associated with BC's forestlands.

Oil and Gas

BC's natural gas industry has been a major economic driver in recent years, with generally high prices offsetting any negative impacts of a stronger Canadian dollar. For several years, the BC treasury has benefited from growing revenues from the fossil fuel industry. Royalty payments to the province from companies pulling oil and natural gas out of BC's energy-rich northeast corner now outstrip income from forestry. Over the past 10 years, production of natural gas in BC has increased by more than 40 per cent, and the number of wells has more than tripled. But there is mounting evidence of a coming shortfall in gas supplies in northeast BC and neighbouring Alberta.

The BC government's active promotion of increased oil and gas extraction makes meeting the 2020 emissions reduction targets a harder task. The 2007 BC Budget, for example, projected that between 2006 and 2010, subsidies to oil and gas companies could exceed \$1 billion. These should be rapidly phased out. Such subsidies accelerate the drilling of oil and gas wells by reducing the royalties that energy companies pay, and they are troubling for many reasons. They encourage unnecessary depletion of a finite resource while upping greenhouse gas emissions. This throws into sharp relief the inherent contradiction in the government's green agenda.

One identified target for emissions reductions is flaring, whereby companies burn off usable gas rather than direct it into pipelines. Flaring occurs for many reasons, commonly when gas is produced at oil wells but not in enough volume to warrant investment in a gas pipeline. In the last 10 years alone, gas flaring, leaks and waste in northeastern BC have been responsible for a staggering 13.5 per cent of the province's total greenhouse gas emissions.

The BC government has rightly said that this must stop, giving gas companies until 2012 to halve flaring and until 2016 to eliminate it. However, this provision applies only to what is known as "routine flaring," a small portion of the total amount that "meets an economic threshold for conservation." More action is needed. Minimally, royalty payments should apply to flared gas, a move that would improve the economic rationale for stopping flaring.

The industry has already made great strides in doing this in neighbouring Alberta. Gas saved from flaring is now processed and sold, meaning the companies recoup some if not all of the added costs of capturing the gas, while the Alberta treasury benefits from more royalty payments. A forward-thinking BC government would take things further, however, and insist that gas saved through an end to flaring be matched by corresponding reductions in overall exploitation rates. Doing so would stretch out the life of our gas resources by several more years, while costing the industry nothing in the way of lost resources.

In addition to taking a more conservation-based approach to development of our finite natural gas reserves, we also ought to ask whether we charge companies enough for the gas they pull from the ground. Recent and highly publicized reports out of Alberta suggest that the

Perversely, BC has had a lively debate over what constitutes sustainable logging of provincial forests, yet no equivalent with fossil fuel resources – which, unlike trees, are non-renewable and a major source of GHGs.

government there is foregoing hundreds of millions of dollars annually in resource rents by setting its royalty rates too low. Perversely, BC has had a lively debate over what constitutes sustainable logging of provincial forests, yet no equivalent with fossil fuel resources – which, unlike trees, are non-renewable and a major source of GHGs. Based on current exploitation rates and reliable estimates of remaining natural gas, northeastern BC's supplies would last just 33 years. A doubling of industry activity – something the province promoted just a few years ago – would deplete reserves in half that time.

Putting a price on carbon emissions may also encourage a transition to carbon-capturing technologies. In Norway, where such taxes are in place, an energy company has chosen to avoid the tax by stripping large amounts of CO₂ from natural gas and pumping it deep underneath the North Sea seabed with the result that less greenhouse gases enter the atmosphere. There are important differences between Norway and BC, particularly with respect to geology, but this precedent is interesting and worth further study.

Relationships with Other Jurisdictions

There are important cross-boundary issues BC must consider in its development of climate change policies. BC has substantial industry and infrastructure associated with the transport of imports to, and exports from, the province and the rest of Canada. BC's relations with oil-rich Alberta are of particular interest. What does it mean if BC gets serious about reducing its GHG emissions, but continues to trade as usual with other jurisdictions that refuse to do so? Ultimately, getting serious about climate change means fundamentally re-thinking our trade-reliance and trading relationships.

BC borders the US states of Washington, Idaho, Montana and Alaska, and has signed on to the Western Climate Initiative, a cross-border cap-and-trade system under development (with six US states participating and the province of Manitoba). How the system is designed is important. Parties to the WCI are currently deliberating on whether to have one cap for all, or to have individual caps for each jurisdiction. Rules about purchasing offsets from other jurisdictions, enforcement, which sectors will be covered, and how to put in place complementary regulatory and incentive-based policies are all under discussion as part of the WCI, with August 2008 as a deadline for striking the final bargain. While other jurisdictions have made their positions on these issues clear, this has not been the case for the BC government. It is imperative that BC immediately disclose its stance on these issues so that stakeholders can make informed commentary on a major plank of the government's mitigation strategy.

The role of international trade is significant when it comes to emission patterns. A recent Statistics Canada report found that Canada's overall emissions increase between 1990 and 2002 was attributable almost entirely to the export sector. Domestic industrial emissions to satisfy domestic demand resulted in a mere 0.4 per cent increase in emissions between 1990 and 2002, while GHG emissions associated with exports rose 50 per cent. Exports were responsible for 46 per cent of Canada's total GHG emissions in 2002, up from 36 per cent in 1990.²³ In addition

to these emissions, there are substantial resource exports that indirectly lead to increased GHG emissions elsewhere (for example, natural gas burned in the US and coal burned in China).

The flipside of exports is imported goods consumed by Canadians. Through global supply chains, Canadians benefit from manufacturing processes, and therefore emissions released, in China and elsewhere. According to the same Statistics Canada publication, emissions abroad associated with satisfying household demand in Canada rose 17 per cent between 1990 and 2002. If BC implements a carbon tax or cap-and-trade system that increases production costs here, these imports raise the question of how we maintain a level playing field. While imposing some form of tariff on imports is desirable, as the European Union is now contemplating, this could prove to be administratively challenging, and furthermore, external tariffs are a federal matter.

As the cost of energy and carbon-intensive goods and services rises, there will be impacts on foreign trade and industries such as tourism that rely on cheap transportation. It is unclear how these will play out over time. Minimally, there is some irony in the provincial government pushing mega-projects like Gateway, airport expansion, the new Vancouver convention centre, and port expansion, all of which are predicated on business-as-usual expansion of foreign trade and travel, while simultaneously pressing forward with a green agenda that, if globally successful, would almost certainly result in less foreign trade and travel – once again, an internal policy contradiction is evident. Moreover, certain sectors like agriculture may become more locally-oriented for food security reasons, irrespective of shifting global trade patterns.

BC is also likely to be seen as a major destination for climate-induced migration (environmental refugees). Ships carrying Chinese migrants to the BC coast in 1999 are an example of the potentially ugly public reaction to the arrival of refugees, and this experience points to lessons for immigration and refugee policies. On the one hand, BC and Canada have a moral obligation to accept increasing numbers of environmental refugees; on the other, population growth will make achieving our own GHG targets harder.

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Conclusion: Keeping Everyone on the Bus

BC's move to make climate change a top priority is welcome. First steps have been taken, but the difficult work has only just begun. The issues raised in this discussion paper are intended to help policy makers better understand the intersection between climate change and social justice. For the CCPA, this is also a first step in a multi-year evaluation of climate policies.

BC is starting from a place where inequality – in terms of incomes, wealth and carbon footprints – has grown in recent decades. Just as poor countries will feel a greater sting from climate change in spite of contributing little to the problem, in BC those who have been the largest emitters of GHGs are not necessarily the ones who will pay the greatest costs of adjustment – unless we ensure otherwise.

Alan Durning of the Seattle-based Sightline Institute comments:

Woods workers in British Columbia are already losing jobs from the climate-induced plague of pine beetles laying waste to the forests. Reservation-dwelling ... First Nations are vulnerable because of their dependence on fisheries, forestry, and agriculture. Immigrant farm laborers – among the poorest workers in Cascadia – also face disproportionate hardship. Dwindling supplies of irrigation water will squeeze harvest jobs, and crop failures from more-variable weather will post “not hiring” signs across farm counties.

This epic injustice gives the lie to the argument that stopping climate change is “just” an environmental issue. Indeed, it makes arresting climate change as much a social priority as an environmental one.

And it argues for climate solutions that are not only efficient and effective but also fair. A certain amount of climate change is already unavoidable. Inevitably, it will punish the blameless. Because climate change takes disproportionately from the poor, we should design our climate solutions to help the poor disproportionately. In other words, climate solutions should make working families and poor nations economically whole.²⁴

There is much we do not yet know about how climate change and climate policies will affect different groups in society and what the best responses should be. From this discussion paper, however, we can extract certain core principles that should inform how we move forward. We have proposed two overarching policy tests:

- First, is the policy *effective* in bringing about the type of change we require (meaning, will it lead to lower overall emissions); and
- Second, what are the *impacts on different population groups*, income levels, and regions of the province (meaning, will the policy reduce or exacerbate inequality).

To these, we would add the following guiding principles:

- The overarching objective should be to improve quality of life in BC while simultaneously moving towards carbon neutrality. Opportunities for win-win solutions should be top of mind.
- Equity must be built into long-run targets for emissions reductions. BC should aim towards equal per person emissions on a global basis (i.e. convergence between rich and poor countries in terms of per capita emissions). And these should be consistent with emission reductions that keep the global average temperature increase to 2°C above pre-industrial times.
- The greatest adjustments will need to be taken by those who have done the most to cause the problem. Poor people, who have small carbon footprints, should not have to sacrifice to the same extent as the richest, who have the largest carbon footprints. In particular, efforts to put a price on carbon must be accompanied by measures that more than offset regressive impacts.
- A broad range of policy tools must be employed, including taxation, public spending, strong regulation, and industrial strategies. Much attention has been paid to market mechanisms that increase the cost of emitting GHGs. In addition to these, regulatory measures will be required to ensure the most affluent and corporations do not simply buy their way out of making needed changes.

The issues raised in this discussion paper are intended to help policy makers better understand the intersection between climate change and social justice. For the CCPA, this is also a first step in a multi-year evaluation of climate policies.

- To achieve its targets, BC cannot ignore large industrial emitters, including the oil and gas industry. A rethink of provincial policies in these areas is needed, including a reduction in the rate of oil and gas extraction. BC's resource base must be harnessed for the common good in areas like agriculture, forestry, electricity generation, and oil and gas. This means ensuring greater public ownership and management of resources in place of short-term private profit-seeking.
- Just transition strategies are needed for workers in affected industries.
- Major changes in patterns of housing and transportation will be required. It is imperative that this transition occur in a coordinated and fair manner. A fundamental rethink of Gateway is needed.
- Optimum policies will differ in rural communities relative to urban centres.
- Climate change will affect patterns of international trade and travel, and BC will need to rethink what it exports and imports through the lens of GHG emissions. In certain areas, like agriculture, achieving greater food security should be an overarching priority. Similarly, BC must reassess its current economic strategies, which are overly reliant on foreign tourism (including convention travel), trade, and fossil fuel exports.
- Agreements like TILMA, which have limited benefit and pose hurdles to effective regulation, should be abandoned if they inhibit effective policies.
- The process for determining policy responses for both adaptation and mitigation must be much more democratic. In order for citizens to have a say in how climate plans unfold, a deep public engagement process must begin immediately to complement the work of the Climate Action Team. Tools of deliberative democracy that have already been used in BC with some success should be used to ensure more than just token consultation.
- Addressing climate change necessitates collective responses, and these must be inherently redistributive and reduce inequality in order to keep everyone on the bus.

Notes

- 1 The CCPA did produce a BC Budget Brief in September 2007, in which we did much of what we usually do in the *BC Solutions Budget*. See *Towards a More Democratic and Credible BC Budget* on the CCPA website.
- 2 Government of Canada, 2004.
- 3 Environment Canada. *Canada's Top Weather Stories for 2007*. Webpage accessed December 2007 at www.ec.gc.ca/doc/smc-msc/m_110/s2_eng.html.
- 4 A word of caution: any firm numbers to date have been stated as reductions from a 2020 "business as usual" baseline, not the 2007 benchmark for emissions reductions. This includes the premier's speech to the Union of BC Municipalities in September 2007, and presentation materials from the deputy minister who leads the Climate Action Secretariat (as relayed by Vancouver Sun journalist Miro Cernetig, accessed at www.canada.com/vancouver/columnists/story.html?id=11ac1bb9-23a7-4c41-8697-93ea72d93730).
- 5 The Pembina Institute's *Mind the Gap* report separates out personal (road and air) transportation as a sector, and adds the remaining transportation emissions to business and industry.
- 6 BC government, 2007.
- 7 Author's calculations based on Environment Canada, 2007.
- 8 Pembina Institute, 2007.
- 9 Lee, 2004.
- 10 Pivot Legal Society, 2007.
- 11 Statistics Canada, *Income in Canada*, various years.
- 12 Murray, 2007.
- 13 See CCPA reports by Klein and Long, 2003 and Wallace et al., 2007.
- 14 An author of the National Round Table on Environment and Economy report comments that "In the NRTEE modelling, and indeed in most carbon abatement assessment, the transport sector is the last to respond, and one of the reasons why deep GHG reductions result in exponentially rising abatement cost curves at emission prices above \$200." Accessed at enviroeconomics.ca/blog/?p=43
- 15 This is known as the elasticity of response. Some commodities, such as gasoline, are highly inelastic, meaning consumption changes very little in response to higher prices.
- 16 Technically, the federal target is between 45 and 65 per cent by 2050. Many observers argue the federal target is much too low, and should be more like 85 to 95 per cent reductions. See David Suzuki Foundation and Pembina Institute, 2005. Meeting a more stringent target would tend to increase the price of emitting GHGs even higher.

- 17 A study by the Congressional Budget Office in the US found that, for a 15 per cent reduction in emissions via a cap-and-trade system, the lowest quintile would pay an additional \$560 per year (3.3 per cent of income), rising to \$960 per year for the middle quintile (2.8 per cent of income), and to \$1,800 per year for the top quintile (3.3 per cent of income). However, if revenues from an auction were used to fund lump-sum allowances to each household, the bottom quintile would actually gain in income by 1.8 per cent on average, the middle quintile would be roughly the same, and the top quintile average income would fall by 0.7 per cent. A more recent analysis from James Boyce and Matthew Riddle in the US reaches a similar finding in its modeling of a \$200 per tonne carbon tax. Their policy returns all of the auctioned revenue to households, and would increase the incomes of the bottom 60 per cent, with a 24 per cent increase for the bottom 10 per cent, and a net loss of income of 2.4 per cent for the top 10 per cent.
- 18 United Nations Development Program, 2001.
- 19 For more details, see Marshall, 2002.
- 20 See Litman, 2007 for a review of these ideas.
- 21 Estimates for US, by Williams-Derry, 2007.
- 22 Calvert, 2007.
- 23 St. Lawrence, 2007.
- 24 Posted on the Sightline Institute blog, www.sightline.org/daily_score/archive/2008/01/24/climate-fairness.

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About the CCPA

The Canadian Centre for Policy Alternatives is an independent, non-partisan research institute concerned with issues of social and economic justice. Founded in 1980, it is one of Canada's leading progressive voices in public policy debates.

The CCPA works to enrich democratic dialogue and ensure Canadians know there are workable solutions to the issues we face. The Centre offers analysis and policy ideas to the media, general public, social justice and labour organizations, academia and government. It produces studies, policy briefs, books, editorials and commentary, and other publications, including *The Monitor*, a monthly magazine. Most of these resources are available free at www.policyalternatives.ca.

Established in 1997, the CCPA's BC Office offers policy research and commentary on a wide range of provincial issues, such as: BC finances, taxation and spending; poverty and welfare policy; BC's resource economy; privatization and P3s; public education financing; health care; and more.

The CCPA is a registered non-profit charity and depends on the support of its more than 10,000 members across Canada.

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About the Climate Justice Project

The Climate Justice Project is a multi-year initiative led by CCPA and the University of British Columbia in collaboration with a large team of academics and community groups from across BC. The project connects the two great "inconvenient truths" of our time: climate change and rising inequality. Its overarching aim is to develop a concrete policy strategy that would see BC meet its targets for reducing greenhouse gas emissions, while simultaneously ensuring that inequality is reduced, and that societal and industrial transitions are just and equitable.