Meeting British Columbia's Targets

A Report from the B.C. Climate Action Team

July 28, 2008

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MESSAGE FROM THE CHAIR

British Columbia's Climate Action Team (CAT) was established in November 2007 to help the government reduce provincial greenhouse gas emissions by 33 per cent by 2020. The team's mandate is threefold:

- to offer expert advice to the province's Cabinet Committee on Climate Action on the most credible, aggressive and economically viable targets possible for 2012 and 2016;
- to identify further actions in the short and medium term to reduce emissions and meet the 2020 target, and
- to provide advice on the provincial government's commitment to become carbon neutral by 2010.

This is an extremely challenging mandate, and one the Climate Action Team has taken very seriously. As chair, I am honoured to work with so many exceptional individuals and grateful for their willingness to share their time, energy and expertise. The 21-member team includes some of the province's best minds, and we are united in the belief that we can find solutions to climate change if governments, business, the scientific and environmental communities and First Nations come together to support constructive actions.

I would like to express my sincere personal appreciation to all the members of the team for contributing their energy, ideas and enthusiasm. I also want to thank the government for providing us with this opportunity to leave a sustainable environmental and economic legacy for future generations.

Sincerely,

Cheryl Slusarchuk
On behalf of the BC Climate Action Team

SUMMARY OF RECOMMENDATIONS TO THE GOVERNMENT OF BRITISH COLUMBIA

PRICING EMISSIONS

1. Government should review progress related to B.C.'s emissions targets, the impact of existing policy measures, actions by other jurisdictions to price emissions, and key economic factors like the cost of oil. Based on this data and recognizing the impact of emissions pricing as a core policy for emissions reduction, the government should:

1.1 After 2012, if required to achieve the emissions targets, increase the British Columbia carbon tax in a manner that aligns with the policies of other jurisdictions and key economic factors.

1.2 By 2012, either expand the carbon tax to cover all greenhouse gas emissions – including those from industrial processes – or include these additional emissions as part of a cap and trade system. Again, this should be done in light of progress toward B.C.'s reduction target, policies of other jurisdictions, and key economic factors.

2. Revenues from the carbon tax should continue to be offset by equivalent reductions in personal, corporate and small business tax rates. Support for low income families should be continued.

PUBLIC ENGAGEMENT AND OUTREACH

3. In collaboration with public and private partners, develop a comprehensive, multidimensional public engagement and outreach campaign that will: 1) educate British Columbians about the importance of climate change and the policies that are necessary to address this issue, 2) help British Columbians reduce their greenhouse gas emissions in the most efficient way possible, and 3) make British Columbians aware of the incentives and savings available by taking action to address climate change.

TRANSPORTATION

4. To further reduce emissions from all fossil fuel-based forms of transportation, increase the low-carbon fuel standard from 10 per cent to 15 per cent by 2020.

5. Introduce program and policy measures to improve the efficiency of heavy-duty vehicles, including niche-market regulation.

6. Remove barriers to improve the efficiency of port operations and explore such options as shifting traffic to off-peak hours, reducing the number of one-way truck movements, and optimizing the use of Prince Rupert and Vancouver Ports.

7. Enhance the role of rail in moving freight in B.C.

8. Work with the other partners in the Western Climate Initiative to include emissions from air travel in the new cap and trade system currently under development. Mandatory carbon credit payments at points of air travel to offset emissions associated with air travel could be considered should the proposed cap and trade system not be in place by January 2012.

BUILDINGS

9. Update B.C.'s Green Building Code at least every three years to ensure the B.C. code is a leader among North American energy codes.

10. Work with local governments on a strategy to ensure a high level of compliance with energy codes through proper building code enforcement in all areas of the province.

11. Introduce new regulations under B.C.'s Energy Efficiency Act to adopt leading North American and international standards. B.C. should also consider portfolio standard approaches to improve the energy performance of appliances and equipment.

12. Require that, by 2016, all new publicly-funded buildings in the province have net-zero GHG emissions and that by 2020 all new houses and buildings in the province have net-zero GHG emissions.

13. By no later than 2012, require all houses and buildings to have a current energy efficiency rating or label when they are sold or transferred.

14. Introduce an aggressive energy efficiency and renewable energy program for houses and buildings, combining incentive and regulatory approaches and co-ordinated across governments and utilities.

ENERGY

15. Build generation and transmission capacity for clean and renewable electricity generation and create a surplus.

16. Create a conservation culture to ensure energy efficiency.

17. Introduce policies and regulations to promote electrification in new oil and gas developments.

18. Accelerate carbon capture and storage deployment.

INDUSTRY

19. Create a cap and trade system that will place a hard cap on large industrial emitters (e.g., through partnerships such as the Western Climate Initiative) or expand the carbon tax to apply to all greenhouse gas emissions, including those from industrial processes by 2012. Ensure the method chosen is consistent with the province's 33 per cent reduction target.

COMMUNITIES

20. Ensure that rural and remote communities have continued access to energy efficiency and clean energy programs and incentives, and access to training to support local green jobs.

21. Create a regulatory regime that encourages compact, smart community development.

22. Double the transportation mode share of cycling and walking by 2020.

23. Take steps to ensure that federal and provincial infrastructure funding for communities is directly tied to demonstrated progress towards achieving complete, compact and energy-efficient communities.

AGRICULTURE

24. Identify and remove regulatory and institutional barriers to clean energy development in the agricultural industry.

25. Work with industry to identify and implement mitigation and adaptation solutions tailored to British Columbia's environment and agricultural markets.

WASTE

26. By 2020, B.C. ends its growing dependency on disposing municipal solid waste in landfills both here and the United States, through a strategy that is based on requiring that the pollution prevention hierarchy (reduce, reuse, recycle, recover, residuals management) be considered in waste management planning and requiring the management of waste as close to the source as possible.

FOREST SECTOR

27. Include forests, land use, the forest-product sector, bioenergy and other renewable wood-derived bio-products in the government's climate action strategy. This should be done with the involvement of stakeholders in a full assessment of mitigation options in terms of greenhouse gas benefits, biodiversity values and other co-benefits.

CARBON-NEUTRAL GOVERNMENT

28. Amend the province's Core Policy and Procedures Manual to emphasize that, when determining the lowest price by a qualified bidder, the government take into account the full lifecycle cost of the goods or services being procured.

29. Remove capital funding restrictions limiting the ability of the public-sector to fund strategic energy retrofits that will achieve significant energy conservation, GHG reductions and operating cost savings.

INTERIM TARGETS

30. By 2012, the growth in emissions must be reversed and emissions must begin to decline significantly, to between five and seven per cent below 2007 levels.

31. By 2016, the decline in emissions needs to accelerate. In order to ensure that B.C.'s 2020 target can be reached, emissions should fall to between 15 and 18 per cent below 2007 levels by 2016.

INTRODUCTION

There is almost complete consensus among leading scientists that we are presenting the planet and ourselves with huge risks by emitting greenhouse gases. Indeed, the science of climate change has now advanced to the point where the evidence is overwhelming: the Earth's climate is rapidly changing, mainly as a result of increases in greenhouse gases caused by human activities.

Scientists, economists and other experts agree that, in the coming years, climate change will affect the most basic elements of life including access to water, food production, health and the environment. British Columbia is feeling the effects of climate change already – from the devastation of the pine beetle epidemic to the increasing frequency of floods and wildfire.

However, as the independent Stern Review[1] concluded in 2006, there is still time to avoid the worst impacts of climate change – if we take strong action now. For example, the report estimates that if we do not act, the overall costs and risks of climate change will be equivalent to losing 20 per cent of global gross domestic product (GDP), whereas the cost of early action can be limited to around one per cent of global GDP.

The independent Stern Review estimates that failing to act on climate change could result in costs and risks equivalent to losing 20 per cent of global GDP. By contrast, the report says the cost of early action can be limited to about one per cent of GDP.

In April 2008, Stern further strengthened his earlier conclusions by noting that the Stern Review had "badly underestimated the degree of damages and the risk of climate change" and clearly demanded immediate action.[2] British Columbia has heeded this advice. The Province has taken aggressive action on a wide range of fronts and, with Phase One of its Climate Action Plan, is moving forward to reduce emissions in every economic sector.

The Climate Action Team sees responding to climate change as an environmental imperative. It is also an enormous economic opportunity for the province. While making the changes necessary to reduce our reliance of fossil fuels will present some costs to our economy, the economic benefits opened up by transitioning to a low-carbon economy are real and substantial.

1 Nicholas Stern, *The Economics of Climate Change: The Stern Review* (Cambridge: University of Cambridge Press, 2006).

2 http://www.independent.co.uk/news/business/news/stern-warns-that-climate-change-is-far-worse-than-2006-estimate-810488.html

These economic opportunities are already being realized elsewhere in the world as the global economy begins to recognize the need to transition to low-carbon energy alternatives. We have only to look to the great success of Germany in the field of solar energy or Denmark in wind to see the huge opportunities that could open up for British Columbia in the future. It is imperative that our province begin to prepare for the realities of a global low-carbon economy as soon as possible.

The Climate Action Team's Challenge

The provincial government has engaged an independent consultant (MK Jaccard and Associates) to conduct the comprehensive economic modeling required to translate climate action measures into actual reductions in greenhouse gas emissions. The Climate Action Team has reviewed this analysis (published in the Climate Action Plan – Phase One, and available online at ***www.livesmartbc.ca***), which concludes that initiatives announced to date will reduce British Columbia's emissions by approximately 23 million tonnes by 2020. This represents approximately 73 per cent of the way to the 2020 target. This means there is a gap of 27 per cent – or nine million tonnes – that the province must close to meet its targets.

These figures are estimates, generated through economic modeling, which is not an exact science. As the Province pointed out in its Climate Action Plan, the best we can do is make realistic estimates based on probable assumptions. For example, B.C.'s population can reasonably be expected to grow to five million by 2020 but other assumptions are much less certain. Oil prices, for example, are difficult to predict, having ranged from about $30 a barrel to over $135 in the space of only five years. To ensure consistency in measuring progress, the Climate Action Team has prepared this report based on the same modeling methodologies used for the government's Climate Action Plan.

The team has also used the independent modeling of MK Jaccard and Associates to estimate the impact of some of the key policies recommended in this report, including regulations on buildings and energy, incentive programs, and a continued emphasis on emissions pricing. The modeling suggests that these initiatives could reduce emissions by eight million tonnes by 2020. However, the actual amount of reduction achieved will depend on how the key policies are implemented, which should be determined in the light of prevailing economic circumstances and progress toward the 2020 target. Team members are confident that, if carried out, the balance of the actions recommended in this report will enable the province to meet its 2020 target.

The Climate Action Team has focused its attention specifically on closing this gap. However, it is important to note that this report also includes some policy measures, particularly related to buildings, communities, and forestry, that will have much longer term impacts and will not result in significant emission reductions by 2020. Such measures are included because the team believes these actions must be taken now if the province is to meet its longer term 2050 target and move toward more sustainable communities in the new low-carbon economy of the future. The report also includes a list of key policy measures that have already been taken by government related to each sector. This "Background – Key Government Actions To Date" sub-section is intended to provide context to the incremental policy recommendations included in the report.

To meet its climate action targets, the province must reduce emissions by another nine million tonnes by 2020 – over and above the initiatives in Phase One of the B.C. Climate Action Plan.

Because the Province's plans to date are so comprehensive, identifying further steps and actions has been challenging. Adding to the challenge is the fact that many of the government's key climate action policies, such as the B.C. carbon tax, are still in the early stages of implementation. We believe these policies need some time to work before their impacts can be assessed and appropriate next steps developed.

In addition, while we recognize the need to measure progress towards B.C.'s targets, members of the Climate Action Team caution against focusing too intensely on economic models that, at best, can provide only plausible estimates. The goal of reducing emissions – as much as possible wherever possible – must not be eclipsed by concerns about differing assumptions based on uncertain variables.

The recommendations in this report were generated through vigorous debate and represent a balance of perspectives among Climate Action Team members whose areas of expertise range from sustainable community planning to corporate leadership to earth and ocean sciences.

The Key Themes

In many cases, the Climate Action Team is recommending that the Province move forward with and build on the strategies and actions identified in the Climate Action Plan. For example, we strongly support the government's decision to emphasize and seize the economic opportunities inherent in the climate action agenda. By embracing innovation and leveraging its natural advantages, British Columbia has a tremendous opportunity to lead and succeed in the new low-carbon economy of the future.

Another theme arising in the team's discussions involves the need to continue to engage First Nations peoples, in keeping with the spirit and intent of the New Relationship. First Nations' knowledge of local lands, their connection to local ecosystems, and their long history of environmental stewardship are critical resources in the fight against climate change. As the United Nations has noted,[3] indigenous and tribal peoples are "the human face" of the effects of global warming, and the traditional knowledge in their communities should be tapped in the search for answers.

A third key theme is public engagement, which the Climate Action Team considers very important. Simply put, B.C. will find it easier to attain its greenhouse gas reduction targets with the support and participation of the people of British Columbia. Our daily habits – as consumers, as employers and employees, as members of geographic communities and communities of interest – will have to change if we truly wish to avoid the worst impacts of global warming.

3 See ***http://www.un.org/Pubs/chronicle/2007/***

Simply put, B.C. will find it easier to attain its greenhouse gas reduction targets with the support and participation of the people of British Columbia.

Human behaviour is not an exact science. Changing our ways is never easy and what we are driving now, as a province, is perhaps the largest and most significant shift in public attitudes ever. We are attempting to alter, in the span of just a few years, behaviours that in many cases have been entrenched for generations. This does not mean we should set our sights lower. It does, however, highlight this final theme in this Climate Action Team report.

Members of the team are encouraged by the level of public discussion and debate generated since the introduction of the government's climate action targets. British Columbians may not agree universally on all related issues, but there is no doubt that the need for climate action has become among the most discussed issues in our province. Further, when polled, British Columbians continually identify climate change as the most pressing environmental issue facing our province.[4] It is critically important that the government meet its emission reduction targets. At the same time, it is the opinion of team members that raising awareness, mobilizing people and achieving momentum towards our targets can be considered a success in its own right.

As the government pointed out in its 2008 Speech from the Throne, every molecule of carbon dioxide emitted into the atmosphere matters. So too does every molecule not emitted. So, even on a global scale, British Columbia's actions are important. They contribute to the efforts of people around the world who are acting today to prevent the problem from growing even worse.

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4 Environics, *Canadian Environmental Barometer*, June 2008.

As noted earlier in this report, the Stern Review has estimated that the cost of not addressing climate change could be equivalent to losing fully 20 per cent of global gross domestic product.[5] By contrast, the costs of mitigating climate change are likely to be a fraction of that – estimated at between one and two per cent of global GDP.[6]

These figures underline the critical importance of advancing our climate action agenda. The need cannot be ignored and, while we still have much work to do, British Columbia's strong early action has laid a firm foundation on which we can build – and from which we hope other jurisdictions will take inspiration and encouragement.

5 Nicholas Stern, *The Economics of Climate Change: The Stern Review* (Cambridge: University of Cambridge Press, 2006).

6 Nicholas Stern, *The Economics of Climate Change: The Stern Review* (Cambridge: University of Cambridge Press, 2006). Similar conclusions were made by the Intergovernmental Panel on Climate Change (IPCC). See Climate Change 2007: Mitigation. Contribution of Working Group III to the Four Assessment Report of the Intergovernmental Panel on Climate Change [B. Metz, O.R. Davidson, P.R. Bosch, R. Dave, L.A. Meyer (eds)], Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

PRICING EMISSIONS

CAT Recommendations:

1. ***Government should review progress related to B.C.'s emissions targets, the impact of existing policy measures, actions by other jurisdictions to price emissions, and key economic factors like the cost of oil. Based on this data and recognizing the impact of emissions pricing as a core policy for emissions reduction, the government should:***
   - ***1.1 After 2012, if required to achieve the emissions targets, increase the British Columbia carbon tax in a manner that aligns with the policies of other jurisdictions and key economic factors.***
   - ***1.2 By 2012, either expand the carbon tax to cover all greenhouse gas emissions – including those from industrial processes – or include these additional emissions as part of a cap and trade system. Again, this should be done in light of progress toward B.C.'s reduction target, policies of other jurisdictions, and key economic factors.***
2. ***Revenues from the carbon tax should continue to be offset by equivalent reductions in personal, corporate and small business tax rates. Support for low income families should be continued.***

Background: Key Government Actions to Date

- Introduced a revenue-neutral carbon tax "to encourage low-carbon economic development while reinvesting every penny of carbon tax revenue into targeted tax cuts for individuals and businesses."[7]
- The tax will be paid by all British Columbians, including business and industry. It applies to all fossil fuels based on their greenhouse gas intensity – including gasoline, diesel, natural gas, fuel oil, propane and coal.
- The tax is being phased in, starting at a rate of $10 per tonne of CO2-equivalent emissions, rising to $30 a tonne by 2012. In the absence of other GHG reduction strategies, it could cause a reduction in B.C.'s emissions of up to three million tonnes per year by 2020.
- For most B.C. families, the value of income tax reductions will typically exceed the cost of the carbon tax in 2008 and 2009. Lower-income families will also receive a climate action tax credit of $100 per adult and $30 per child per year, paid quarterly along with the federal GST credit.

7 *Climate Action Plan, Phase One* . See ***www.livesmartbc.ca***

- The Province has also begun to work with other jurisdictions in the Western Climate Initiative to develop a cap and trade system – a market-based mechanism that uses free market principles to reduce GHG emissions.

For details on these and any other existing provincial climate action initiatives, go to ***www.livesmartbc.ca*** and consult the BC Climate Action Plan – Phase One.

THE B.C. CARBON TAX

The introduction of the B.C. carbon tax, effective July 2008, is a critical element in making the transition to low-carbon energy alternatives. By putting a price on carbon emissions, the tax creates new and powerful incentives for consumers, business and industry to change the habits and technologies that created global warming in the first place. Higher prices for higher-carbon choices also make greener options more commercially viable, encouraging the development of innovative new solutions.

It is important to note that the tax is not intended, on its own, to "solve" global warming. It is simply the most effect instrument available that will, over time, support and encourage the shift we must make to reduce our reliance on fossil fuels. The world's leading climate experts and a number of international groups, including the United Nations Intergovernmental Panel on Climate Change, agree that an effective response to the challenges of climate change must include pricing carbon emissions and making clear that the atmosphere is not a free dumping ground.

Putting a price on carbon is probably the single most important thing a government can do right now.

- Jeff Rubin, Chief Economist, CIBC World Markets, February 21, 2008

Discussion

Just as leading scientists worldwide have reached consensus on the facts and realities of global warming, leading economists agree that the solution must include putting a price on greenhouse gas emissions. As Harvard University professor N. Gregory Mankiw, a former advisor to U.S. President George W. Bush, wrote in a recent article in the New York Times, "Basic economics tells us that when you tax something, you normally get less of it. So if we want to reduce global emissions of carbon, we need a global carbon tax."[8]

8 See *Climate Change 2007: Mitigation. Contribution of Working Group III to the Four Assessment Report of the Intergovernmental Panel on Climate Change* [B. Metz, O.R. Davidson, P.R. Bosch, R. Dave, L.A. Meyer (eds)], Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

Closer to home, the David Suzuki Foundation calls a carbon tax "one of the most powerful incentives and tools that governments have to encourage companies and households to pollute less and invest in cleaner technologies and practices."[9] Members of the Climate Action Team agree with this assessment.

There is also a strong agreement among many in British Columbia that any carbon tax introduced by government must be revenue-neutral – with all proceeds "recycled" through reductions to other taxes. Again, the Climate Action Team agrees with this perspective.

In our view, the B.C. carbon tax, which took effect on July 1, is a critical part of the government's plan to reduce greenhouse gas emissions. It applies to all GHG emissions from the combustion of fossil fuels that are captured in Environment Canada's National Inventory Report. Putting a clear price on carbon emissions is imperative if we are to have any success in reducing emissions.

The tax is currently set at $10 per tonne of CO2-equivalent emissions with the rate set to rise by $5 a year to a total of $30 in 2012.

The Climate Action Team strongly supports the carbon tax and its concomitant tax reductions. Pricing emissions sends a signal to industry, business and consumers and encourages cleaner, more sustainable choices while tax reductions will help to stimulate further economic growth. For example, in 2009, B.C. will have the lowest personal income tax rates of any Canadian province on incomes up to $111,000 and income taxes will be reduced further as carbon tax revenue increases.

Although we appreciate the government's decision to introduce the tax at a low rate and phase it in slowly to allow people time to adapt, we believe that higher rates will be required to achieve the province's GHG reduction targets. However, we believe that this should be done in the light of prevailing economic circumstances and progress toward the 2020 reduction target.

The government has laid out a careful path in introducing the carbon tax in such a way that does not adversely affect the competitiveness of the province. The government should continue to ensure that tax cuts play an important role in the structure of the carbon tax and keep a keen eye both on how other jurisdictions are responding to climate change, and how well British Columbia business is able to compete internationally. With this in mind however, it remains the belief of the Climate Action Team that the benefits of taking action on climate change in our province far outweigh the costs of not acting.

It is also imperative that the Province continue to protect low-income British Columbians by providing equitable carbon tax shifting measures, and by providing alternatives and incentives that allow people to make choices that will help reduce their personal greenhouse gas emissions and save money at the same time.

The Climate Action Team therefore recommends that the government review progress related to B.C.'s emissions targets, the impact of existing policy measures, actions by other jurisdictions to

9 *http://www.davidsuzuki.org/files/climate/Briefing_Note_-_BC_Budget_2008.pdf*

price emissions, and key economic factors like the cost of oil. Based on this data and recognizing emissions pricing as a core policy for emissions reduction, the government should:

1.1 After 2012, if required to achieve the emissions targets, increase the British Columbia carbon tax in a manner that aligns with the policies of other jurisdictions and key economic factors.

Although the tax applies to the combustion of fossil fuels by industry, as well as personal and business uses, it does not apply to non-combustion emissions that result from industrial processes. Examples of these emissions include venting of CO2 in the processing of natural gas, curing cement and smelting of aluminium. It is important to note that no other jurisdiction has applied a carbon tax to these emissions either. Nevertheless, these emissions account for about 11 per cent of British Columbia's total greenhouse gas emissions.

Given that putting a price on greenhouse gas emissions is a foundational policy for mitigating climate change, the Climate Action Team recommends that the Province should:

1.2 By 2012, either expand the carbon tax to cover all greenhouse gas emissions – including those from industrial processes – or include these additional emissions as part of a cap and trade system. Again, this should be done in light of progress toward B.C.'s reduction target, policies of other jurisdictions, and key economic factors.

Finally, as discussed above, the Climate Action Team strongly supports the policy of tax shifting and the use of carbon tax revenue to fund tax reductions in other areas. As a result, the team recommends that:

2. Revenues from the carbon tax should continue to be offset by equivalent reductions in personal, corporate and small business tax rates. Support for low income families should be continued.

PUBLIC ENGAGEMENT AND OUTREACH

CAT Recommendations:

3. ***In collaboration with public and private partners, develop a comprehensive, multidimensional public engagement and outreach campaign that will: 1) educate British Columbians about the importance of climate change and the policies that are necessary to address this issue, 2) help British Columbians reduce their greenhouse gas emissions in the most efficient way possible, and 3) make British Columbians aware of the incentives and savings available by taking action to address climate change.***

Background: Key Government Actions to Date

- Extensive public engagement across the province including climate action summits with youth and the faith community as well as symposia with key industry sectors.
- Committed to establish Citizens' Conservation Councils across the province to build a network for grassroots climate action.
- Introduced the LiveSmart BC Energy Efficiency Incentive Program, a broad-based initiative to engage British Columbians in the fight against climate change. This three-year, $60-million program offers a range of new incentives for reducing energy consumption in homes and small businesses, including provincial sales tax exemptions on energy-efficient appliances, vehicles, machinery and equipment.
- The Province estimates that this initial phase of LiveSmart BC will reduce greenhouse gas emissions by 200,000 tonnes by 2012.
- Launched the LiveSmart website, which will provide a central location for information about programs that will help British Columbians make lifestyle choices that will save them money and help the environment.

For more on LiveSmart BC, go to ***www.livesmartbc.ca***

Discussion

Climate change is an issue that affects every one of us, and every one of us has a role in mitigating its impacts. To reduce per capita emissions to the degree necessary to meet the Province's greenhouse gas reductions targets, the Climate Action Team believes that British Columbians must be educated about the seriousness and urgency of the climate change issue and about the kinds of policies that are, and can be, developed.

We recognize the complexities involved in motivating and achieving widespread behaviour change – and the limited success of past attempts to do so. However, there remains an urgent need to take action in this area.

The Province's LiveSmart program, launched in early 2008 with its first phase, the LiveSmart BC Energy Efficiency Incentive Program, is a good start and can be built upon. The information provided by the government on its livesmartbc.ca website must therefore be expanded and developed further.

The CAT also acknowledges the government's commitment to create one or more Citizen's Conservation Councils to assist British Columbians in making the changes necessary to shrink their carbon footprints. However, more public engagement and outreach is required. Therefore, the Climate Action Team is recommending that:

3. **In collaboration with public and private partners, develop a comprehensive, multidimensional public engagement and outreach campaign that will: 1) educate British Columbians about the importance of climate change and the policies that are necessary to address this issue and 2) help British Columbians reduce their own greenhouse gas emissions in the most efficient way possible, and 3) make British Columbians aware of the incentives and savings available by taking action on climate change.**

This campaign must target more than British Columbians' household and transportation-related emissions. It must also recognize the many roles British Columbians play – as small business owners and operators, as public-sector employees, as members of various industrial sectors, communities and groups – and leverage existing opportunities for engagement.

A potential site of public engagement exists when citizens take driver's education courses and become licensed to drive in the province. In this process, the public could be educated about lower-emissions driving techniques and about the relative emissions of different personal vehicles and modes of transportation.

It is also imperative that efforts to engage with British Columbians create opportunities for two-way dialogue, allowing citizens to participate fully in creating the necessary solutions for low-carbon lifestyles. This is key to the success of any public engagement campaign. In fact, the team strongly believes in the need to create as many opportunities for dialogue and involvement in the creation of climate action solutions as possible.

The campaign must take fully into account our province's great geographic, social and cultural diversity, and should fully utilize both traditional and innovative communications media to effectively reach and resonate with all British Columbians.

As part of this campaign, First Nations should be engaged to draw on their traditional knowledge of the land and environment in support of climate action.

The team also recognizes the importance of educating British Columbia's youth about climate change, and recommends that climate issues be incorporated into curricula for grades K-12. Museums, libraries and online social marketing tools should also be used to involve youth in climate action.

TRANSPORTATION

CAT Recommendations:

4. ***To further reduce emissions from all fossil fuel-based forms of transportation, increase the low-carbon fuel standard from 10 per cent to 15 per cent by 2020.***
5. ***Introduce program and policy initiatives to improve the efficiency of heavy-duty vehicles, including niche-market regulation.***
6. ***Remove barriers to improve the efficiency of port operations and explore such options as shifting traffic to off-peak hours, reducing the number of one-way truck movements, and optimizing the use of Prince Rupert and Vancouver Ports.***
7. ***Enhance the role of rail in moving freight in B.C.***
8. ***Work with the other partners in the Western Climate Initiative to include emissions from air travel in the new cap and trade system currently under development. Mandatory carbon credit payments at points of air travel to offset emissions associated with air travel could be considered should the proposed cap and trade system not be in place by January 2012.***

Background: Key Government Actions to Date

- Introduced legislation to adopt tailpipe emission standards equivalent to California's. The standards, which are also being adopted in many U.S. states, are designed to encourage manufacturers to sell more fuel-efficient vehicles.
- Expanded the Scrap-It program, which provides incentives for British Columbians with older (pre-1995) vehicles to switch to cleaner alternatives.
- Provided provincial sales tax exemptions for hybrid and fuel-efficient vehicles, and invested in cleaner transit and school buses.
- Passed legislation designed to reduce the average carbon intensity of transportation fuels by at least 10 per cent by 2020.
- Provided ongoing support for hydrogen and fuel cell technology development.
- Introduced a $14-billion Provincial Transit Plan designed to double transit ridership by 2020.
- Introduced carbon pricing on fossil fuels in the form of the revenue-neutral carbon tax.
- Started work on electrifying truck stops and ports, as part of a broader commitment to reduce idling provincewide.
- Provided support for anti-idling campaigns across the province.

The BC Transit Plan can be found at ***www.th.gov.bc.ca/Transit_Plan/index.html***.

Discussion

The transportation sector is the largest single source of greenhouse gas emissions in British Columbia, representing 36 per cent of the province's total GHGs. This figure underlines the critical importance of reducing emissions from this sector, which can be attributed to the following sources:

- Passenger Vehicles: 37 per cent
- Heavy Duty Vehicles (Freight): 24 per cent
- Off-Road: 20 per cent
- Marine: 10 per cent
- Air: 7 per cent
- Rail: 2 per cent

The Climate Action Team is encouraged by the comprehensive suite of policies already announced to address emissions from transportation. These include legislation to adopt California tailpipe standards, low-carbon fuel legislation, the new Provincial Transit Plan, port electrification, anti-idling and more. They also include the introduction of emission pricing through the B.C. carbon tax, which will provide further incentives to reduce the use of fossil fuels in all areas, including transportation.

These are important policies that will certainly have a significant impact on transportation emissions in British Columbia. However, while the policies B.C. has announced to date will work to slow and even halt the growth of emissions from transportation, the sector is expected to remain a leading cause of emissions for our province.

In addition, many of the actions that must be taken to reduce transportation-related emissions in the long term are related to community development initiatives and will take many years to realize emission reduction. Indeed, to significantly reduce transportation emissions, we must fundamentally re-shape the way our communities are built. This will take time, commitment, and imagination. (Recommendations related to community development are included in the Communities section of this report).

In this context, the Climate Action Team's recommendations for passenger vehicles, freight (including marine) and air travel are listed below.

PASSENGER VEHICLES

To date, most of the transportation-related GHG reduction policies announced by the government relate to personal transportation. The Climate Action Team is confident these policies will have an impact on personal transportation emissions. Therefore, we are recommending expansion of one key existing policy: the province's low-carbon fuel standard. Under legislation passed in 2008, fuel distributors will be required to measure the average global warming intensity of their products and reduce it over time.

Intensity is measured on a lifecycle or well-to-wheels approach. It takes into account all emission-creating activities related to the use and production of the fuel, including land-use changes that

result from biofuel production. B.C. is targeting at least a 10 per cent reduction in the average carbon intensity of transportation fuels by 2020.

Industry will determine how best to meet the standard. There are many possible paths for compliance, including biofuels, electricity, hybrid vehicles, flex-fuel vehicles and fuel cells. Carbon intensity can also be reduced at refineries, through actions that improve efficiency and reduce on-site greenhouse gas emissions. The lifecycle approach will encourage the development of biofuels with lower upstream emissions. These include ethanol from agricultural wastes, forest residues and perennial grasses. This initiative is supported by the Province's new Bioenergy Strategy and helps to encourage fuel switching to less greenhouse gas-intensive forms. The Climate Action Team's recommendation to government is:

4. **To further reduce emissions from all fossil fuel-based forms of transportation, increase the low-carbon fuel standard from 10 per cent to 15 per cent by 2020.**

The Climate Action Team is aware of the concerns surrounding the production of corn-based ethanol and the competing claims of energy and food on global land resources. For this reason, while the team recognizes the important role that a low-carbon fuel standard can play in meeting greenhouse gas reduction targets, it also recommends the development and use of cellulosic ethanol as a means of reaching this standard. Reliance on corn-based ethanol should be avoided.

GOODS MOVEMENT

The efficient movement of goods is important to B.C.'s economy. At the same time, however, freight traffic accounts for more than half of provincial transportation emissions. While the low-carbon fuel standard will contribute to lowering freight emissions, actions also need to be taken to improve the performance and use of heavy-duty trucks and also shift freight traffic to lower-emission modes.

Fuel is a significant cost for the trucking industry. There are a number of market-ready technologies that can effectively cut fuel costs and GHG emissions associated with the long-haul, oil and gas, and logging trucking industries, including cowling and other aerodynamic devices, auxiliary power units (APUs), cabin heaters, overnight engine heaters and other idle-reduction technologies. The provincial government could work with industry to encourage and support the adoption of these technologies.

The greater use of marine and rail transportation and the more efficient operation of B.C.'s major ports also offer the potential for significant reductions in greenhouse gas emissions from goods movement. For example, a large proportion of truck trips through Lower Mainland ports either enter or leave empty. Advances in information technology can be applied to better match vehicle requirements and supply. Congestion can also be reduced by expanding operating hours and shifting traffic to off-peak times. The Climate Action Team notes that B.C.'s marine ports are already taking steps to extend operations and recommends that the provincial government work with ports to ensure successful implementation.

A considerable amount of freight moves directly from ocean-going vessels to rail and then to destinations across North America. However, there may also be opportunities to increase the use of rail, possibly through the development of an inland container port.

In order to achieve further greenhouse gas emissions from the freight transportation sector, the Climate Action Team recommends that the B.C. government:

5. **Introduce program and policy initiatives to improve the efficiency of heavy-duty vehicles, including niche-market regulation.**[10]
6. **Remove barriers to improve the efficiency of port operations, such as shifting traffic to off-peak hours, reducing the number of one-way truck movements, and optimizing the use of the Prince Rupert and Vancouver Ports.**
7. **Enhance the role of rail in moving freight in B.C.**

AIR TRAVEL AND SHIPPING

Emissions from air travel and shipping are expected to account for almost 50 per cent of passenger transportation emissions by 2020. This projection is due in part to expected reductions from other areas within the transportation sector, and to a lack of alternative fuel options for aircraft.

To reduce the environmental impact of air travel and shipping in British Columbia, the Climate Action Team recommends that:

8. **The B.C. government work with its partners in the Western Climate Initiative to include emissions from air travel and shipping in the new cap and trade system currently under development.**

Other partners in the Western Climate Initiative include the U.S. states of Washington, Oregon, California, Arizona, New Mexico, Utah and Montana, and the Canadian provinces of Manitoba, Ontario and Quebec. Should emissions from air travel and shipping not be included in this cap and trade system by 2012, the team recommends using a system of mandatory carbon offsets at point of air travel to ensure that these emissions are adequately priced and offset.

10 "Niche-market regulation" is a regulation that guarantees a small but growing "niche-market" for new technologies that are low emission but high cost. One example is the renewable portfolio standard, which provides a small but growing market share for renewable electricity generation like wind, solar, small hydro and geothermal. Twenty-six US states have a renewable portfolio standard. Another example is the California vehicle emission standard, which provides a small but growing market share for ultra-low- and zero-emission vehicles. Because other states have adopted the California vehicle standard, it now covers over 35 per cent of the U.S. market.

BUILDINGS

CAT Recommendations:

9. ***Update B.C.'s Green Building Code at least every three years to ensure B.C.'s code is a leader among North American energy codes.***
10. ***Work with local governments on a strategy to ensure a high level of compliance with energy codes through proper building code enforcement in all areas of the province.***
11. ***Introduce new regulations under B.C.'s Energy Efficiency Act to adopt leading North American and international standards. B.C. should also consider portfolio standard approaches to improve the energy performance of appliances and equipment.***
12. ***Require that, by 2016, all new publicly-funded buildings in the province have net-zero GHG emissions and that by 2020 all new houses and buildings have net-zero GHG emissions.***
13. ***By no later than 2012, require all houses and buildings to have a current energy efficiency rating or label when they are sold or transferred.***
14. ***Introduce an aggressive energy efficiency and renewable energy program for houses and buildings, combining incentive and regulatory approaches and co-ordinated across governments and utilities.***

Background: Key Government Actions to Date

- Introduced new Green Building Code requirements to increase energy and water efficiency.
- Developed a new Energy-efficient Buildings Strategy that complements the BC Energy Plan.
- Introduced legislation requiring that all official community plans and regional growth strategies include greenhouse gas emission reduction targets, policies and actions.
- Began work on a plan to install solar roofs on 100,000 residential and commercial buildings by 2020.
- Introduced a range of new energy efficiency programs, including energy performance labeling for buildings and targets for energy-efficient lighting.

Information about greening the BC Building Code can be found at
www.housing.gov.bc.ca/building/green/

Discussion

National inventory estimates suggest that space and water heating in our buildings contributes 12 per cent of the province's total GHG emissions.

However, this estimate does not account for all the emissions we may commonly associate with buildings. For example, buildings also consume a significant proportion of electricity for their operations. There are also emissions associated with the construction, maintenance, demolition, transportation and disposal of building materials.

Action needs to be taken in this sector not only to help meet the province's 2020 target, but also to put the province on a path to the green communities needed to reach the 2050 target. The Climate Action Team's recommendations for this sector are in two categories: new buildings and existing buildings.

NEW BUILDINGS

Houses and other buildings last for many years, so design and construction decisions made today will still be affecting energy use and emissions in 2020 and 2050. It is also far more economic to include energy efficiency in a new building than to renovate later.

B.C.'s new Green Building Code requires new houses to meet the EnerGuide 77 standard or equivalent, and requires large buildings to meet or exceed ASHRAE 90.1 (2004). ASHRAE 90.1 is an existing North American standard for energy efficiency in buildings that is updated on a regular cycle. The 2007 edition was recently published and ASHRAE is targeting a 30 per cent improvement for the 2010 version. ASHRAE is currently aiming for a net-zero energy building standard by 2020.

LEED also includes minimum energy efficiency requirements. Currently, LEED requires that the design energy consumption of the building be at least 25 per cent better than Canada's Model National Energy Code for Buildings, or 18 per cent better (on an energy cost basis) than ASHRAE 90.1 (1999).

Having a strong green building code in place will not only help us meet greenhouse gas reduction targets, but will also create a competitive advantage for the future of our architectural, engineering, and building industry.

Therefore, the Climate Action Team recommends that B.C.:

9. **Update the Green Building Code at least every three years ensure B.C.'s code is a leader among North American energy codes.**

The energy efficiency requirements for commercial and multi-storey residential new buildings should be at least equivalent to the requirements of LEED. Energy efficiency requirements for housing should be at least equivalent to EnerGuide 80 by 2010 and should exceed EnerGuide 90 by 2020.

The labeling requirement (Recommendation 13 below) will require that the energy performance of all new houses and buildings be verified by third parties. This will help ensure compliance with the Green Building Code as well as address local government capacity concerns by enabling the use of independent verifiers. In addition, the government should:

10. **Work with local governments on a strategy to ensure a high level of compliance with energy codes through proper building code enforcement in all areas of the province.**

APPLIANCES AND OTHER EQUIPMENT

Appliances and equipment use significant amounts of energy and contribute significant quantities of greenhouse gases. To reduce these emissions, the Climate Action Team recommends that the Province:

11. **Introduce new regulations under B.C.'s Energy Efficiency Act to adopt leading North American and international standards. B.C. should also consider portfolio standard approaches to improve the energy performance of appliances and equipment.**

Appliance and equipment standards should meet Energy Star requirements and target products that contribute significantly to greenhouse gas emissions in buildings, especially space and water heating equipment. An energy efficiency portfolio standard would require appliance manufacturers to meet minimum energy standards for key product lines (e.g., refrigerators) and to sell increasingly efficient products over time.

NET-ZERO EMISSION HOMES AND BUILDINGS

A net-zero emissions building is characterized by significant reductions in fossil fuel use, with the remaining net energy needs met from community-based or on-site, renewable and waste energy resources. In order to get to net-zero emissions, new houses and buildings could either incorporate on-site, zero emission energy supplies or meet their energy needs from clean energy sources. This is preferred to a shift toward grid-supplied, baseboard electric heating, given electricity conservation targets.

The resource availability of renewable and waste energy resources will vary by region. In addition, the feasibility of achieving net-zero emissions may vary by building types, land-use patterns and other factors that are specific to individual communities.

Given the potential of the net-zero approach to reduce B.C.'s greenhouse gas emissions, the Climate Action Team recommends that the Province:

12. **Require that, by 2016, all new publicly-funded building in the province should be required to have net-zero GHG emissions and that by 2020 all new houses and buildings in the province have net-zero GHG emissions.**

EXISTING BUILDINGS

Most of our current buildings will still be around in 2020 and 2050. Improvements to these buildings will help save money and can improve indoor air quality, thus adding health benefits in the process of reducing emissions. To support and help accelerate the move to more energy-efficient buildings, the Climate Action Team recommends that the Province:

13. **By no later than 2012, all houses and buildings should be required to have a current energy-efficiency rating or label when they are sold or transferred.**

Making energy performance information available will provide incentives for owners to upgrade energy efficiency, and provide buyers with the basis for informed choices.

Energy performance ratings for buildings will also enable a wide range of other policies, in the same way that efficiency ratings for appliances enabled programs like BC Hydro's Power Smart and the Environmental Protection Agency's Energy Star system.

To further support efficiency upgrades for existing homes and buildings, the Climate Action Team also recommends that government:

14. **Introduce an aggressive energy efficiency and renewable energy program for houses and buildings, combining incentive and regulatory approaches and co-ordinated across governments and utilities.**

Elements of this initiative could include:

- an expanded LiveSmart BC: Efficiency Incentive Program targeted to homes, apartment buildings and small businesses.
- align and expand utility demand side management programs with Energy Plan objectives and recent changes to the BC Utilities Commission Act to enable utilities to facilitate and fund enhanced incentive and finance programs for conservation.
- a new home program that supports voluntary adoption of new standards (e.g., EnerGuide 85) in advance of regulatory requirements, including one or more of local government incentives or requirements, variable utility hook-up fees, or direct financial rebates to builders.
- a high-performance program for commercial/multi-residential/institutional buildings that provides incentives closer to the cost of new energy production.
- new financing mechanisms for residential and commercial building retrofits, potentially including utility bill financing, revolving funds, and the use of local improvement charges.
- promotion of "improvement mortgages" for home buyers to access capital for energy efficiency improvements with long-term amortization periods, building upon CMHC mortgage insurance refunds for efficient homes.
- a requirement that major renovations of existing commercial and multi-storey residential buildings to meet energy efficiency standards (e.g., at least the LEED prerequisite).
- restructuring property tax assessments to remove disincentives (or provide credits) for energy efficiency and on-site or district renewable energy so that strategies such as solar do not add to the assessed values of homes for property taxes.
- funding for the inclusion of renewable energy technologies in buildings.

ENERGY

CAT Recommendations:

15. ***Build generation and capacity for clean and renewable electricity generation and create a surplus.***
16. ***Create a conservation culture to ensure energy efficiency.***
17. ***Introduce policies and regulations to promote electrification in new oil and gas developments.***
18. ***Accelerate carbon capture and storage deployment.***

Background: Key Government Actions to Date

- Introduced the new *BC Energy Plan: A Vision for Clean Energy Leadership*, which includes the following key climate action elements:
  - » the Province will be electricity self-sufficient by 2016
  - » all new electricity generation projects will have zero-net greenhouse gas emissions
  - » all routine flaring at oil and gas producing wells and production facilities will be eliminated by 2016 with an interim goal of reducing flaring by 50 per cent by 2011
  - » clean or renewable energy will continue to account for at least 90 per cent of total generation
  - » zero greenhouse gas emissions will be allowed from any coal thermal generation facilities
  - » BC Hydro will acquire 50 per cent of its incremental electricity needs through conservation by 2020.
- Introduced the Remote Community Clean Energy Program to support clean alternative energy and energy efficiency solutions.
- Provided support for alternative energy development in areas such as wind and tidal power.
- Launched the BC Bioenergy Strategy to encourage research and development in areas such as wood-waste cogeneration, biofuel production and wood pellet production.

The BC Energy Plan can be found at ***www.energyplan.gov.bc.ca/***

Discussion

B.C.'s energy sector invests billions of dollars in the province every year and, in 2006, made over $2 billion in payments to the government through royalties and other fees. Key segments of the sector include electricity generation and oil and gas supply, but the sector extends to refineries and coal mining as well. Alongside the sizeable economic benefits are sizeable greenhouse gas emissions: the energy sector accounts for about 20 per cent of B.C.'s total emissions.

GREEN POWER

B.C. is already a major energy exporter, producing more than four times the natural gas it uses and exporting wood pellets to Europe to provide renewable energy. Despite abundant resources, this is not the case for electricity.

The Climate Action Team supports the aggressive conservation targets and demand management measures being undertaken by the power utilities, particularly the smart meter initiative in the province's Climate Action Plan. Beyond using electricity wisely in current applications, some of the best opportunities to reduce emissions involve using electricity in new applications, such as in electric vehicles and electrified oil and gas facilities, or exporting clean electricity to neighbouring jurisdictions at premium prices. To maximize these benefits, B.C. needs to develop and use its green electricity resources to the fullest extent, and add transmission infrastructure to integrate those resources, consistent with sustainability criteria. At the same time, it must take steps to further reduce emissions associated with the production of fossil fuels.

MARKET CONTEXT

BC Hydro operates within the Western Electricity Coordinating Council (WECC), the largest and most diverse area covered by the North American Electricity Reliability Council (NERC). The market area extends from Canada (including B.C. and Alberta) to Mexico and is characterized by significant north-south transmission inter-ties between British Columbia and the United States. These allow for the movement and trade of large volumes of electricity according to regional supply and demand.

Within this market there are many opportunities. For example, California is driving a growing market for renewable power with its legislated Renewables Portfolio Standard Program (RPS). It requires electricity retailers to purchase at least 20 per cent of supply from renewable resources by 2010.[11] The state government is actively considering increasing that requirement to 33 per cent by 2020. To meet the 2010 target, California needs to add 20,000 to 30,000 gigawatt hours (GWh) of new renewable electricity to its grid. To meet the potential 2020 target, the state would likely need to add an additional 40,000-50,000 GWh. The cap and trade system being designed with B.C.'s WCI partners will also create a market for renewable electricity.

RESOURCE POTENTIAL

B.C. is well positioned to take advantage of emerging opportunities in this sector and may be in a position to help other jurisdictions meet their demand for clean and renewable sources of energy. The province has a wealth of green power potential including hydro, biomass, wind, solar, and ocean resources that are yet to be developed. At the same time, it is anticipated that demand for clean hydroelectric and renewable power will continue to grow here at home as our economy grows and may accelerate in the future as our reliance on fossil fuels for transportation begins to diminish. Increased demand for clean electricity will certainly result as new technologies like plug-in hybrid vehicles come into the market, for example. Clean energy targets that exceed self-sufficiency by

11 In 2004, 10 per cent of California's electricity generation came from renewable resources.

2016 (2007 Energy Plan) would increase the certainty of achieving our emission-reduction goals and the resulting surplus could exported.

As result, the Climate Action Team recommends that British Columbia:

15. **Build generation and transmission capacity for clean and renewable electricity generation and create a surplus.**

This would likely involve identifying key green power transmission corridors to the best areas for green power development and prioritize these developments, including the development of needed transmission infrastructure. The Climate Action Team also suggests that the B.C. government extend and expand the existing Innovative Clean Energy Fund as a means of encouraging alternative clean energy technologies in the province.

Of course, it will also be important to continue to use demand side management techniques to help conserve energy and avoid waste. Programs like BC Hydro's Power Smart should therefore be continued and other such strategies developed. As a general direction for the future, the Climate Action Team recommends that the Province continue to implement strategies and programs that will:

16. **Create a conservation culture to ensure energy efficiency.**

There can be little doubt that electrification does present some significant opportunities for green-house gas reduction in our province. New oil and gas developments in particular lend themselves very well to electrification in the field, as well as in gathering and processing facilities. Larger new developments have the scope and scale to permit electricity distribution or transmission lines to be connected, eliminating the need for natural gas-driven compressors, pumps and equipment. The Climate Action Team therefore recommends that the Province:

17. **Introduce policies and regulations to promote electrification in new oil and gas developments.**

ENCOURAGING CARBON CAPTURE AND STORAGE

The final Climate Action Team recommendation for this sector involves the capture and storage of carbon. As noted previously, applying the carbon tax to formation gas emissions will create new incentives for producers to capture and store carbon emissions. Beyond creating a value chain for CO_2 in the province, however, including costly physical infrastructure requirements, several key policy determinations are needed to enable carbon capture and storage (CCS.) These include developing rules for accessing storage, and for assigning long-term liability for storage.

Closing these policy gaps as soon as possible is essential to the timely deployment of CCS in British Columbia. Therefore, the Climate Action Team recommends that the government help to:

18. **Accelerate carbon capture and storage deployment.**

INDUSTRY

CAT Recommendation:

19. Create a cap and trade system that will place a hard cap on large industrial emitters (e.g., through partnerships such as the Western Climate Initiative) or expand the carbon tax to apply to all greenhouse gas emissions, including those from industrial processes by 2012. Ensure the method chosen is consistent with the province's 33 per cent reduction target.

Background: Key Government Actions to Date

- Introduced the Greenhouse Gas Reduction (Cap and Trade) Act, which allows the province to regulate GHG emissions for various types of industry. The Province has also started work with partners in the Western Climate Initiative to develop a regional market-based cap and trade system.
- Began work with industry partners to encourage investment in leading edge technologies and processes to support environmentally sustainable growth and development.

Discussion

The Climate Action Team recognizes the significance of the carbon tax and cap and trade system already announced by the B.C. government as a greenhouse gas reduction strategy for industry. Cap and trade systems are already in place and working in many jurisdictions around the world, and market-based emission reductions strategies such as cap and trade have been shown to help drive the lowest-cost emission reductions possible. Therefore, the Climate Action Team recommends that the government:

19. Create a cap and trade system that will place a hard cap on large industrial emitters (e.g., through partnerships such as the Western Climate Initiative) or expand the carbon tax to apply to all greenhouse gas emissions, including those from industrial processes by 2012. Ensure the method chosen is consistent with the province's 33 per cent reduction target.

Beyond industrial emissions from burning fossil fuels, some industries have "process" emissions. These emissions result from the specific processes involved in producing goods such as cement and aluminum. They also include carbon dioxide released during natural gas processing. B.C.'s industrial process emissions, also called fixed process emissions, total approximately seven MT, or about 11 per cent of total greenhouse gas emissions.

Given that putting a price on greenhouse gas emissions is a foundational policy for mitigating climate change, the Climate Action Team recommends, as noted previously, that by 2012 the province should either expand the carbon tax to cover industrial process emissions or include these emissions as part of a cap and trade system.

These process emissions are directly tied to the underlying industrial process, and are not affected by the industry's choice of fuel. For a given industrial process, the options for reducing emissions may be limited to carbon capture and storage, or implementing advanced or alternative processes.

Given the close link between process emissions and specific industrial technologies – technologies used by competing facilities around the world – the Climate Action Team recommended in the Energy section of this report that carbon capture and storage deployment be facilitated and accelerated.

COMMUNITIES

CAT Recommendations:

20. ***Ensure that rural and remote communities have continued access to energy efficiency and clean-energy programs and incentives, and access to training to support local green jobs.***
21. ***Create a regulatory regime that encourages compact, smart community development.***
22. ***Double the transportation mode share of cycling and walking by 2020.***
23. ***Take steps to ensure that federal and provincial infrastructure funding for communities is directly tied to demonstrated progress towards achieving complete, compact and energy-efficient communities.***

Background: Key Government Actions to Date

- Introduced legislation encouraging and supporting the development of compact communities to help reduce energy and servicing costs, increase opportunities for people to walk and cycle and work, and reduce greenhouse gas emissions.
- Provided assistance to local governments for energy-efficiency, sustainable land-use planning, community energy planning and greenhouse gas emission reduction initiatives.
- Developed Towns for Tomorrow, a program that supports communities with populations of 5,000 or less in meeting sustainability challenges.
- Launched the Green City Awards to recognize excellence in livability, climate action and innovation by local governments across B.C.

Discussion

In the context of climate action, communities play a key role in issues related to land use, density and urban form, and also in areas related to values, attitudes and behaviour change. Both of these are crucial to medium- and long-term GHG emission reduction. British Columbia will not be able to achieve its long-term (2050) goals by adding mitigation (and adaptation) measures to an essentially unsustainable underlying development path. Instead we need to change direction and adopt an inherently low emission development pathway. Only if this can be accomplished can we get to the extremely low emission reductions targets set for 2050.

Emissions will be very significantly affected by decisions we make about how we design our communities and organize human activities. Changes in land use, density and urban form that help

reduce emissions are essential to any strategy that will change the development path, because they change the underlying drivers of emissions.

Denser urban developments, for example, require less energy to heat and cool, and require less transportation energy to move people around. These are not savings achieved by adding more efficient technology or behaviour change to pre-existing energy uses; they are inherently lower emission activities. When combined with the mitigation and adaptation measures that will help achieve the province's shorter-term emission goals, they offer the potential of achieving much lower emission futures.

The Province has already started to move in this direction, and has a wide range of strategies in place to support the development of greener communities. The Climate Action Team supports these initiatives and recommends they be built upon.

The other critical component of large-scale changes in emissions is behavioural change. Changes in how people think about and use energy are likely to be a necessary part of achieving our long-term climate goals, both with respect to changes in energy using behaviours themselves and also with regard to acceptance of the kinds of policy measures required to achieve other savings (e.g. the changes in land use or urban form discussed above).

While the major effect of these two areas of climate action will occur in the post-2020 period, it is essential that they be started now, since fundamental change in both underlying infrastructure and in human attitudes and behaviours have long lead times. We need to begin now to make the changes that will give rise to more sustainable development pathways in the future.

Most such work to-date has focused on specific mitigation (and adaptation) measures. Research done for the Intergovernmental Panel on Climate Change has shown an inherently low emission pathway is a sustainable development pathway. We therefore have the opportunity to develop routes to the future that will not only result in very significantly lower-emissions, but also contribute to other environmental, social and economic goals.

Paying attention to the underlying development path offers the potential for the kinds of transformative changes in emission-causing activities that will be required to achieve climate-change goals around the world. It also allows us to connect our climate-change goals to the larger sustainability agenda.

Since the focus of the CAT report is emission reduction to 2020, we have only begun to articulate the outlines of what might be involved in these longer-term issue areas. Much further work is needed.

In the meantime, to build on existing government initiatives that seek to encourage green communities, the Climate Action Team is recommending action in the following areas:

RURAL AND REMOTE COMMUNITIES

Rural and remote communities differ significantly from urban centres, however both areas can make significant contributions and benefit from taking action on climate change.

With the growing demand for greener solutions, B.C.'s rural communities have a wealth of opportunities to develop clean energy from renewable sources such as micro-hydro, biomass, geo-thermal

and geo-exchange. (list of opportunities to be integrated) Investments in these areas can create more jobs – and more local, sustainable jobs – than traditional energy supply projects. Recognizing this fact, the Climate Action Team recommends that the Province:

20. **Ensure that rural and remote communities have continued access to energy efficiency and clean energy programs and incentives, and access to training to support local green jobs.**

REGULATION

British Columbia's existing regulatory system can create disincentives and barriers to compact, smart community development. Unfortunately, far too often, development patterns result in urban sprawl that creates an unnecessary increase in transportation-related greenhouse gas emissions. Therefore, the Climate Action Team recommends that the Province:

21. **Create a regulatory regime that encourages compact, integrated and smart community development.**

TOOLS TO PROMOTE GREEN DEVELOPMENT

Green Communities legislation introduced in 2008 requires local governments to include GHG reduction targets and strategies in their community plans and regional growth strategies by 2010/2011, and enables local governments to encourage green development through reduced development cost charges and other measures. Government should provide additional flexibility and tools to local governments to enable them to set and meet more aggressive GHG reduction targets. These could include:

- Enabling local governments to use local improvement charges and other innovative financing mechanisms to support energy efficiency and clean-energy projects, such as district energy systems;
- Removing regulatory and institutional barriers to district energy systems
- Enabling local governments to go beyond the provincial Green Building Code to include energy efficiency and clean-energy requirements to meet local objectives.

ALTERNATIVE TRANSPORTATION INFRASTRUCTURE

Alternatives to passenger vehicle travel include not just transit but walking and cycling. In fact, walking is the fastest growing mode of transportation in Vancouver. The Province has announced a $14-billion plan to double transit ridership. Significant investments in cycling and pedestrian infrastructure are also needed. This is particularly the case in smaller communities outside the Lower Mainland. Therefore, the Climate Action Team recommends that B.C.:

22. **Double the transportation mode share of cycling and walking by 2020.**

INFRASTRUCTURE FUNDING

Federal and provincial governments provide hundreds of millions of dollars to support local government investments in infrastructure. The CAT recommends that government:

23. **Take steps to ensure that federal and provincial infrastructure funding for communities is directly tied to demonstrated progress towards achieving complete, compact and energy-efficient communities.**

Progress should be measured against performance targets for sustainable community development that differentiate between larger centres and smaller, rural communities.

AGRICULTURE

CAT Recommendations:

24. Identify and remove regulatory and institutional barriers to clean energy development in the agricultural industry.

25. Work with industry to identify and implement mitigation and adaptation solutions that are tailored to British Columbia's environment and agricultural markets.

Background: Key Government Actions to Date

- Hosted an Agriculture Climate Action forum in 2007 to identify key issues. This forum led to the development of an agricultural Climate Action Initiative project, which will include an agricultural climate change action plan.
- Began exploring, in partnership with industry, opportunities such as anaerobic digestion to both reduce GHGs and recapture energy from agricultural waste.

For more on agriculture policy, *The Agriculture Plan: Growing a Healthy Future for B.C. Families* can be found at ***www.al.gov.bc.ca/Agriculture_Plan***.

Discussion

The agriculture sector currently contributes approximately four per cent of B.C.'s greenhouse gas emissions. At the same time, it has considerable clean energy potential, particularly in light of the Province's new Bioenergy Strategy. As we move to a low-carbon economy, the sector is expected to become an important producer of carbon offsets. However, in the current environment, regulatory and institutional barriers can inhibit the adoption of economically feasible on-farm renewable electricity and non-food crop fuel production. Therefore the Climate Action Team recommends that the Province:

24. Identify and remove regulatory and institutional barriers to clean energy development in the agricultural industry.

Agricultural management approaches to livestock, soils, and manure can mitigate GHG emissions. However, the agricultural industry in B.C. is extremely diverse and faces a wide range of challenges and opportunities that vary by region and industry sub-sector. The Climate Action Team recognizes the complexity of the agricultural sector in B.C. and therefore recommends that the Province:

25. Work with industry to identify and implement mitigation and adaptation solutions that are tailored to British Columbia's environment and agricultural markets.

WASTE

CAT Recommendation:

26. By 2020, B.C. ends its growing dependency on disposing municipal solid waste in landfills both here and the United States through a strategy that is based on requiring that the pollution prevention hierarchy (reduce, reuse, recycle, recover, residuals management) be considered in waste-management planning and requiring the management of waste as close to the source as possible.

Background: Key Government Actions to Date

- Introduced legislation to mandate recovery of methane gas from landfills.
- Supported regional districts in their ongoing efforts to redirect organic waste going to landfills.
- Enacted regulations requiring a range of industries to recycle their products rather than allowing them to end up in landfills.

Discussion

The B.C. government has already committed to significantly reduce emissions of methane from landfills. Steps also need to be taken to significantly reduce the amount of material deposited in landfills, through the diversion of organics, construction waste, and other materials. More needs to be done, not only to recognize the potential of waste as a resource, but also to reduce "wastefulness" in general. To support this shift, the Climate Action Team recommends that the Province:

26. By 2020, B.C. ends its growing dependency on disposing municipal solid waste in landfills both here and the United States through a strategy that is based on requiring that the pollution prevention hierarchy (reduce, reuse, recycle, recover, residuals management) be considered in waste-management planning and requiring the management of waste as close to the source as possible.

The strategy would include items such as:

- Organics diversion
- Extended producer responsibility
- Expanded composting
- Strict Waste-Energy standards for air quality and energy efficiency
- Residuals management.

FOREST SECTOR

CAT Recommendation:

27. Include forests, land use, the forest-product sector, bioenergy and other renewable wood-derived bio-products in the government's climate action strategy. This should be done with the involvement of stakeholders in a full assessment of mitigation options in terms of greenhouse gas benefits, biodiversity values and other co-benefits.

Background: Key Government Actions to Date

- Introduced Forests for Tomorrow, an initiative designed to enhance management practices so that forest ecosystems are resilient to stress caused by climate change and other impacts of human activity.
- Started work to implement the Mountain Pine Beetle Action Plan, to ensure long-term economic sustainability for affected communities.
- Developed a new urban afforestation initiative, Trees for Tomorrow, that will see millions of trees planted in back yards, schoolyards, hospital grounds, civic parks, campuses, parking lots and other public spaces.
- Set a leading-edge target of "net-zero deforestation" to ensure that, whenever forest land is converted to other uses, non-forest land is planted elsewhere in B.C. to off-set the loss of forest area. This is unique in the world and represents an important commitment to protecting our forests.
- Introduced a Bioenergy Strategy to open up new opportunities in areas such as wood-waste cogeneration, biofuel production and wood pellet production.

Discussion

B.C.'s forests are a large, long-term store of carbon. Due primarily to natural disturbances, including wildfires and insect outbreaks, the annual net balance of greenhouse gas emissions and uptake fluctuates on a year-to-year basis. Although a net sink in most years since 1990, B.C.'s forests are currently a net carbon source and are projected to remain a source for some years, until the forests recover from the mountain pine beetle outbreak. In the peak outbreak years (2009 and 2010) the mountain pine beetle will have affected the forest carbon balance by 73 million tonnes of CO2 per year by reducing carbon uptake through photosynthesis, and by increasing carbon release through the decomposition of dead trees.

Human activities also have a significant impact on forest carbon – and there are opportunities to improve the greenhouse gas balance of B.C.'s forests against the backdrop of natural disturbances.

Permanent conversion of forested land to other uses (deforestation) releases carbon dioxide to the atmosphere and reduces the area of forest available to remove carbon in the future. The Government of B.C. has already announced a policy of zero-net deforestation, which will require new forests to be planted to compensate for unavoidable losses. Afforestation activities could also be increased beyond this level to more than compensate for deforestation, subject to the availability of suitable areas.

Sustainable forest management also provides opportunities to reduce emissions (sources) and to increase the uptake rates of carbon dioxide from the atmosphere (sinks) relative to a business-as-usual baseline. Many of these options will also provide co-benefits for future wood supply, habitat, and other forest values, but they may also involve trade-offs. The complexity of forest, forest sector, and other land-use mitigation options and their carbon benefits over time requires that further analyses be conducted. Mitigation opportunities can be aimed at reducing emissions (e.g. by reducing slash burning, redirect logging from old-growth forests to second growth, or salvage logging of beetle and fire-killed stands for lumber, other wood products or energy) or be aimed at increasing uptake (e.g. by establishing productive forests on not sufficiently stocked (NSR) lands, increased planting after insect or fires, to reduce the natural regeneration delay, enhancing tree growth through fertilization, tree improvement and other silviculture activities, or lengthening harvest rotations).

Forest management and afforestation activities have the potential to contribute towards climate mitigation objectives by 2020. Larger mitigation benefits are possible in the years between 2020 and 2050, from investment in activities with long-term benefits.

In addition to being a standing store of carbon, B.C.'s forests contribute to emission reductions in other important ways. Wood products can store carbon for decades, for example in buildings. And forests provide timber, fibre and energy to meet society's demands in ways that are generally much less emissions-intensive compared to alternatives such as steel, aluminum, plastics or concrete. While current international accounting guidelines do not reflect these contributions, it is possible that future rules may provide greater incentives to include mitigation activities involving carbon retention in wood products, and emission reductions through product substitution.

Finally, the use of forest biomass for energy has enabled the forest manufacturing sector in B.C. to significantly reduce its fossil GHG emissions. With 850 MW of biomass generation capacity, the B.C. industry is North America's single largest producer of biomass power. Maintaining and enhancing this capacity can support B.C.'s transition to a lower-carbon economy.

It is also vital to recognize the community values related to forestry. Quite aside from their role in storing carbon and supporting emission reductions, healthy diverse forests play a key role in the quality of life of many B.C. communities, providing aesthetic, recreational, tourism and educational opportunities, as well as contributing to healthy air- and watersheds. Although many of these values cannot be quantified, they must be considered in the implementation of forest-related climate action initiatives.

The importance of British Columbia's forests in society's migration toward a low-carbon global economy is pivotal. To ensure this value is fully recognized, well-advised actions must be taken in both built and natural environments to achieve visible and sustainable provincial emissions reductions

by 2012, 2016 and 2020. This will require boundary-spanning innovations and cross-disciplinary approaches that involve earth sciences, applied sciences and social sciences.

This could range from new silviculture practices and species, to new carbon-sequestering wood products for the built environment, to efficient multi-purposing of existing industrial sites and facilities in remote rural and urban communities. Due to the complexity and unique potential this presents for British Columbians, the Climate Action Team recommends that the Province:

27. **Include forests, land use, the forest-product sector, bioenergy and other renewable wood-derived bio-products in the government's climate action strategy. This should be done with the involvement of stakeholders in a full assessment of mitigation option in terms of greenhouse gas benefits, biodiversity values and other co-benefits.**

CARBON-NEUTRAL GOVERNMENT

CAT Recommendations:

28. Amend the Province's Core Policy and Procedures Manual to emphasize that, when determining the lowest price by a qualified bidder, the government take into account the full lifecycle cost of the goods or services being procured.

29. Remove capital funding restrictions that limit the ability of the public-sector to fund strategic energy retrofits that will achieve significant energy conservation, GHG reductions and operating cost savings.

Background: Key Government Actions to Date

- Enacted legislation requiring that all government operations – including provincial ministries and agencies, schools, colleges, universities, health authorities and Crown corporations – become carbon-neutral by 2010.
- Established the Pacific Carbon Trust, a new provincial Crown corporation that will offer carbon offsets that meet high standards of environmental integrity.
- Started developing a green purchasing policy.
- Entered a Public-sector Energy Conservation Agreement with BC Hydro to significantly increase energy conservation and expand the use of alternative energy options across the 6,500 public-sector buildings in the province.

Discussion

As in other economic sectors, British Columbia has already taken significant steps towards a carbon-neutral government. Legislation introduced in 2007 requires all provincial public-sector organizations to report their baseline greenhouse gas emissions, reduce these emissions as much as possible, and offset any remaining emissions. All public-sector organizations will also be required to publicly report on their emissions levels, actions they have taken to reduce these levels, and their plans for continuing to minimize emissions. No other government in North America has made this commitment.

As part of its move to become carbon-neutral, the Province has also begun developing a green procurement policy to reduce the carbon footprint of the goods and services it buys from contractors and private sector suppliers. Given that the government spends a significant amount each year procuring goods and services, this represents an important opportunity to further reduce greenhouse gas emissions. Through its procurement policy, the B.C. government could influence the supply chain in the province in important ways, creating and developing the market for more sustain-

able, less carbon-intense products and services. This is turn could create a wealth of low-carbon opportunity for British Columbian businesses.

The Climate Action Team recognizes that, in developing such a policy, the government faces a number of challenges, such as the need for technical expertise to verify vendors' statements about the ecological footprints of their goods and services. The Province is developing strategies to overcome these challenges. However, it is also currently restricted by the dictates of its own Core Policy and Procedures Manual. The manual states that, "In the case of Invitation to Tenders (ITTs) and Invitation to Quotes (ITQs), contracts must be awarded to the lowest-priced qualified bidder meeting the terms and conditions of the solicitation document."

While an initial upfront price may appear to be lower, current policy and practice do not provide for lifecycle cost assessments, including costs related to disposal and waste reduction. To address this, the Climate Action Team recommends that:

28. **The Province move immediately to amend its Core Policy and Procedures Manual to emphasize that, when determining the lowest price by a qualified bidder, the government take into account the full lifecycle cost of the goods or services being procured.**

This signal would support the business case for suppliers to invest in the capital and processes required in order address both GHG emissions and the broader ecological footprint of the products they supply.

The Climate Action Team also sees potential to enhance public-sector greenhouse gas reduction by eliminating barriers to investments in retrofits for existing public buildings. Through implementation of the Public-sector Energy Conservation Agreement (PSECA), capital restrictions were identified that limit the effective investment in energy efficiency retrofit projects and achieving significant greenhouse (GHG) reductions, including:

- Capital thresholds of $100,000 (per building) which preclude high-quality retrofit projects under the threshold; and
- Limited borrowing capability that restricts the nature of the retrofit projects to smaller projects with a quick payback, resulting in a lost opportunity to look at the complete building system. Once the initial retrofit is done it may not be economically feasible to pursue the full suite of opportunities at a later time.

There is an opportunity to leverage PSECA funding into larger projects that will reduce the costs associated with carbon-neutral government operations with little or no risk to British Columbia. The limited capital thresholds, capped borrowing capability, focus on shorter term payback and inability to leverage funding means that many larger retrofits with significant greenhouse gas reductions and energy savings will not occur.

To address this, the Climate Action Team recommends that the Province:

29. **Remove capital funding restrictions that limit the ability of the public-sector to fund strategic energy retrofits that will achieve significant energy conservation, GHG reductions and operating-cost savings.**

INTERIM TARGETS

CAT Recommendations:

30. **By 2012, the growth in emissions must be reversed and emissions must begin to decline significantly, to between five and seven per cent below 2007 levels.**

31. By 2016, the decline in emissions needs to accelerate. In order to ensure that B.C.'s 2020 target can be reached, emissions should fall to between 15 and 18 per cent below 2007 levels by 2016.

Background: Key Government Actions to Date

- Legislated a greenhouse gas reduction target of 33 per cent by 2020 (based on 2007 levels).

Discussion

As part of its mandate, the Climate Action Team was tasked with making recommendations on interim emissions targets for 2012 and 2016. The Greenhouse Gas Reduction Targets Act of November 2007 requires that the Province set these interim targets by the end of 2008.

The team notes that in order to meet the 2020 target, emissions will need to peak and quickly begin to decline from current levels. It is encouraging that B.C.'s emissions fell in 2005 and 2006, but this short-term trend must become permanent.

The team also notes that many of the policies in the Climate Action Plan and recommended by the team are designed to influence investments and purchases of new energy-using equipment (buildings, appliances, vehicles) and are phased in over time (like the revenue-neutral carbon tax). For example, emission standards for new vehicles will initially have a small impact, but by 2020 will have impacted most of the vehicles on the road. The cumulative effect of these policies means that emission reductions will be greater in 2020 than in the next few years.

The path of emissions between now and 2020 will depend on a number of factors, including:

- energy prices, and in particular world oil prices,
- economic activity, in B.C. and the global economy,
- the timing and impact of new B.C. policies and programs that impact GHG emissions, as well as Canadian federal policies and the design and implementation of the WCI cap and trade system,
- the timing of major new emission reduction investments, such as carbon capture and storage, and
- revisions to Canada's national inventory that may affect how B.C.'s emissions are measured and reported.

Some of these factors, for example, oil prices, are highly uncertain and could have a significant impact on future of emissions in B.C.

Taking into account these uncertainties, the Climate Action Team recommends that the B.C. government set targets for 2012 and 2016 in the following ranges to ensure B.C. is on a path to reach its 2020 target:

30. **By 2012, the growth in emissions must be reversed and emissions must begin to decline significantly, to between five and seven per cent below 2007 levels.**

31. **By 2016, the decline in emissions needs to accelerate. In order to ensure that B.C.'s 2020 target can be reached, emissions should fall to between 15 and 18 per cent below 2007 levels by 2016.**

To ensure that targets in these ranges are feasible and consistent with achieving the 2020 target, the team solicited the advice of MK Jaccard and Associates to help estimate the impact of the team's policy recommendations. This modeling took into account the policy measures outlined in the provincial Climate Action Plan – Phase One, as well as some of the key policies recommended in this report, including regulations, incentive programs, and a continued emphasis on emissions pricing. The analysis indicates that the suite of policy recommendations outlined in this Climate Action Team Report to Government, in combination with the Climate Action Plan, is consistent with achieving these interim targets as well as the 2020 target.

In recognition of the many uncertainties and risks associated with the actual path of emissions over the next few years, the team notes that the government may wish to carry out additional sensitivity analyses before refining the recommended range.

APPENDIX: CLIMATE ACTION TEAM MEMBERS

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NOTES

This plan was printed using paper stock made with 100% post consumer recycled fiber.