



SUMMER-FALL 2016

Canada's slow shuffle forward on climate action

Sybil Seitzinger, PICS executive director

Despite an encouraging upswing on climate action in recent months, Ottawa's inability to secure a true pan-Canadian deal on clean growth and climate change, due to Saskatchewan and Manitoba not signing, is disappointing. However, given Canada's patchwork of provincial and territorial climate and energy policies—as well as resistance to change from some—agreement was always going to be hard fought, despite tremendous work behind the scenes.

Leading up to the First Ministers' meeting on December 9 were announcements of intended federal policies to help cut carbon pollution across most sectors – including an accelerated phase-out of coal-fired electricity, a new low-carbon fuel standard, and a national carbon price, which seems to be the most contentious.

From a climate perspective, these gains for climate change mitigation should also be weighed against recent federal decisions to support expansion in the fossil fuel sectors – specifically, a [liquefied natural gas project](#) in British Columbia and [two new pipelines](#) from Alberta's oil sands region to the BC coast and Wisconsin. While most of the emissions from these export products would be on other jurisdictions' carbon tallies, in a global sense, it all counts.

Closer to home, BC's mix of climate and economic policies tell a similar story. In August I accepted the invitation to speak at the launch of the BC government's Climate Leadership Plan (CLP). In my speech I welcomed the 21 new actions outlined in the plan that will hit all the major sources of emissions in this province. I also noted that the CLP—which is the first of several planned announcements by the province—would not take us even half way toward meeting BC's legislated emissions target of 12.6 Mt carbon dioxide equivalents (CO₂e) per year by 2050.

Fast-forward to December, and I can now put firmer numbers on the extent of the challenge before us. In partnership with the Pembina Institute and Clean Energy Canada, PICS has [released an independent assessment](#) of BC's Climate Leadership Plan and Federal Carbon Price on BC's greenhouse gas emissions.

After crunching the numbers, we now know that the CLP will take British Columbia only about one third of the way towards meeting that 2050 target. The modelling shows that if the government does not take any new climate action, emissions will clock in at about 76 Mt by the middle of the century, up from around 60 Mt today, largely due to planned expansion within

BC's natural gas sector. The policies in the CLP will cut these annual emissions back down to 54 Mt, but it is still well short of the goal, which is 12.6 Mt.

This new report is useful for policy and decision makers, as well as of interest to the public, because it highlights the extent of the gap – 41 Mt –



Dr. Seitzinger at the August 2016 launch of the Climate Leadership Plan, with Premier Christy Clark and Environment Minister Mary Polak

that we have to address. The report also helps identify where additional opportunities lie within individual sectors for more emissions reductions.

Stronger policies to decarbonize industry, transport and the built environment, and to reduce emissions from natural gas are needed to bridge that gap. PICS and its partners are committed to supporting the BC government's implementation of those next steps.

Amidst all this effort, it is important to remind ourselves of why it is crucial that we redefine our energy use towards a low-carbon future. Nearly 200 countries, including Canada, signed the UN's Paris Agreement to limit global average temperature rise to well below 2°C (above pre-industrial levels), to prevent some of the most dangerous effects of climate change. The current set of pledges to lower emissions made by the signatories, if adhered to, would likely result in 3.7°C of warming by the end of this century.

Clearly, more ambitious reductions are needed. In fact, globally we need to reach net zero emissions by around 2070 to stay below the threshold, according to essentially all the climate models. As 2016 burns through the heat records to become the hottest year in the modern temperature record, which dates back to 1880, the time for accelerated climate action is now. Action at all levels, municipal, provincial, national and international, will collectively define our future global climate.

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Closing the gap on BC's climate targets

British Columbia's Climate Leadership Plan will not get the province close to meeting its legislated carbon pollution reduction targets, and will in fact boost emissions in certain key sectors, according to new economic modelling results released by PICS, Pembina and Clean Energy Canada in December.

The analysis, prepared by Navius Research, was the first independent assessment of the CLP and the federal government's carbon price schedule. The CLP was released in August 2016, and is the first in the government's planned series of carbon action policies.

The analysis projects that the combined carbon pollution from LNG and natural gas, industry and utilities, transport, and buildings will increase until 2030 (to 68Mt) and remain above current levels (around 60Mt) until at least 2050. Most of the increase is due to expansion of the natural gas industry and products. Carbon pollution from these combined sources is forecast to reach 66 Mt by 2050. The modelling did not incorporate carbon abatement from forestry, which government estimates would bring emissions levels down by 12 Mt to 53 Mt, which is still well short of the legislated 2050 target of 12.6 Mt.

Full details of the report including the [media release](#), [technical report](#) and [data reports](#) are available on the PICS website.

The Global PICS model

Visiting Fellow Tsung Sheng Liao will be officially recommending to the Taiwan government that it establish an independent networking type organization such as the Pacific Institute for Climate Solutions to assist with its climate action goals. His recommendation follows a two-month visit to PICS at the University of Victoria during summer.

Tsung Sheng, who is an associate professor of law at National Chung Cheng University in Taiwan, was on a research grant from Taiwan's Ministry of Foreign Affairs.

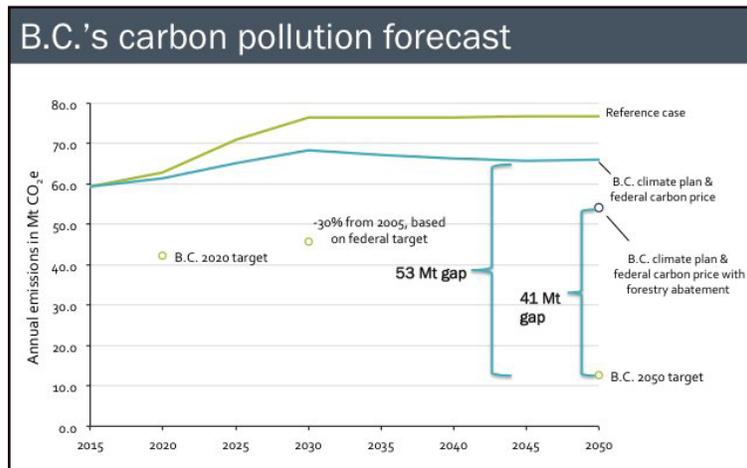
A key focus was studying how the institute's organizational structure (as a politically neutral, non-state actor), combined with its networking approach to research and communications, impacted on its role to assist local, provincial and federal decision-makers in combating climate change.

Tsung believes several factors make the PICS approach ideal to tackling climate change: these include freedom from political influence, academic support without rigidity, training and investment in younger generations through research projects and education outreach, and the ability to act as a bridge between

government, business, NGOs, and the public. PICS's flexibility to offer solutions that extend beyond British Columbia and Canada is also important, he says.

"I strongly recommend that the Taiwan government set up a mechanism similar to PICS, which can extend environmental diplomacy and innovative research with other jurisdictions, to not only solve the problem of global warming but also to strengthen bilateral partnerships," he says. "The 21st century is the era of networks interconnected on issues, and the PICS model offers the best mechanism for that."

As a non-member state, Taiwan was unable to sign the UN's Paris Agreement in December, but last year its government passed a Greenhouse Gas Reduction and Management Act (which aims for a 50 percent greenhouse gas reduction by 2050 compared with 2005 levels). Tsung says Taiwan is highly vulnerable to climate change and is open to solutions, which he would like to see PICS having a future advisory role in.



Visiting Fellow Tsung Sheng Liao

Cleaner cities: how to reduce GHGs in urban areas

PICS-supported researchers have been briefing stakeholders including City of Vancouver officials this fall, with a [fresh analysis](#) of policies that aim to reduce carbon pollution in urban areas.

The report, Evaluation of Actions and Policies to Reduce Urban GHG Emissions Using Multiple Criteria, was released in August,

and is part of the work being undertaken by the PICS' [Built Environment Project](#). Rose Murphy, who is a PICS post-doc, and PICS Fellow Kaitlin Boyd, produced the report with co-author Prof. Mark Jaccard, from Simon Fraser University.



PICS SFU Fellow Kaitlin Boyd

The report uses the City of Vancouver as a case study in its evaluation of standard policies (regulations, charges, subsidies etc.) that are used by municipalities to induce actions, such as energy conservation or using public transit. The analysis also includes demographic factors (e.g. age, income level, and family size) and intangible values, such as consumer preference, that are typically omitted during such policy evaluation.

Kaitlin says that understanding these demographic tendencies is key to determining the effectiveness of policies to reduce GHGs. The project identified data gaps, and questioned whether some commonly accepted actions to reduce emissions, such as increasing urban density, are equally useful in all circumstances.

The report has been a key element in the briefings for officials working on Vancouver's 100% renewables goal, but its findings are also relevant to other communities striving to reduce their climate impact.

Kaitlin defended her thesis in January 2016. Since then she has been working with different UN agencies in Europe. She will be returning to Canada in January 2017 to work with Alberta Energy as a policy analyst on the province's coal phase-out.

The psychology behind climate action

PICS joined forces with the American Council for an Energy Efficient Economy (AEEE) this fall to promote a new [PICS white paper](#) on the psychological reasons why people do – or don't – take climate action, and how to inspire positive, lasting behaviour change.

The report, [Social Mobilization: How to Encourage Action on Climate Change](#), offers an analysis of environmental psychology research in western industrialized society spanning the past four decades.

Lead researcher, Reuven Sussman from the ACEE, says a key finding was that financial incentives, such as rebates, are often not enough to encourage consumers in Western societies to adopt climate-friendly behaviour. Such efforts are more effective if matched up



White Paper author Reuven Sussman

with appeals to personal identity and values.

While there was no "one size fits all" solution, overall the report found that the most effective programmes combine pricing strategies with psychology based ones. Particularly effective are those that provide tailored information, solicit pledges, recruit community leaders and offer direct, personalised feedback.

Is aerial-based technology the solution for studying glacier change?

Research by UNBC PICS Fellow Ben Pelto shows promising signs of overcoming one of the main barriers to studying glacier change – reaching their often remote and inaccessible locations.

This fall Ben spent a month visiting and measuring his study site glaciers across the Columbia Mountains. What he found was that his field-derived estimates of how much mass glaciers gain or lose in a year continued to agree with his estimates for the same glaciers when using an aerial technology called LiDAR. LiDAR is short for Light Detection and Ranging and uses pulsed light to examine Earth's surface characteristics. Ben says he is getting closer to confirming that this technology can provide accurate glacier mass change data without having to step onto the ice.

"This finding enables me to move forward with the goal of proving the feasibility of employing LiDAR surveys to increase the number of glaciers monitored in western Canada".

Given that the Columbia Basin contains over 2000 glaciers, methods of estimating glacier change that don't require site visits would be invaluable to other glaciologists. Ben says a previous study with this same finding covered only one glacier for one season. His work, in comparison, is looking at several glaciers over multiple years, showing that airborne laser altimetry can be used to estimate seasonal mass change for glaciers across a mountain range, and across years of differing magnitudes of change.

There are nearly 200,000 glaciers in the world, of those, fewer than 100 are presently being studied for annual mass balance.



PICS UNBC Fellow Ben Pelto drilling ice cores

Seasonal mass balance estimates, like those provided by Ben Peltó's study, will not only improve our understanding of regional responses to climate change, but also inform our use of water in the future. Ben, who is four years into his study, anticipates defending his thesis in early 2019. He presented his research at the [American Geophysical Union's Fall meeting](#) this December.



Natural Gas Project Fellow Chelsea Notte

Both the Government of Alberta and Environment and Climate Change Canada have initiated ambitious methane emission reductions for the upstream oil and gas sector.

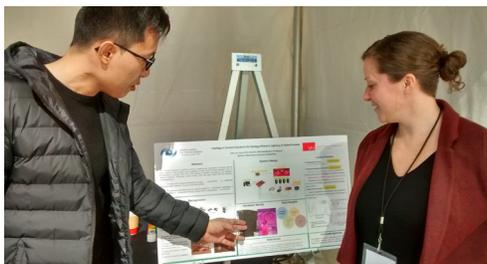
To better understand which regulatory tools and performance standards would be most effective in the Alberta context, the AER conducted extensive stakeholder engagement sessions with industry and environmental

non-governmental organizations over the summer. These focus groups enabled the AER to conduct a gap analysis; providing information on where and how data might be improved, and how this could be applied to Alberta's unique development context.

Optimizing plant growth while reducing energy consumption

Research conducted by PICS SFU fellow Alex Jiang

aims to optimize plant growth in greenhouses by using intelligent control systems for energy-efficient lighting. His proposed system—which comprises an intelligent sensor network, distributed control nodes, and LED grow lights—has two main goals: reducing



Alex Jiang presenting at Vancouver's Clean Tech Expo

supplemental energy consumption by optimizing LED grow-light intensity through automated controls, and improving crop productivity by using the spectrum modification capabilities of LED technology to manipulate the light quality.

A mini greenhouse has been set up in the lab and Alex is currently working on the design of the control system. So far the data show a 40% increase in the crop quality control precision, 30% cultivation time reduction and energy savings of at least 70%. This past September, Alex presented a poster of his research at the [2016 Greater Vancouver Clean Technology Expo and Championship](#), many attendees showed great interest in the LED lighting control in greenhouses and its potential. For more information visit his [fellowship profile](#).

Helping Alberta reduce oil and gas sector emissions

PICS SFU Fellow Chelsea Notte spent the past summer working for the Alberta Energy Regulator (AER) as an analyst and assisting in the first stages of developing Alberta's new climate policy regulations.

The research that Chelsea conducted is helping to inform the provincial and federal governments as they draft new regulations and performance measures in a carbon constrained world. Chelsea is a PICS Fellow with the institute's major [natural gas project](#).

In case you missed it . . .

Check out our online [Events Archive](#) to see PICS supported events held this summer and fall including:

- [Is the Paris Agreement on Track? What happened at COP22? PICS SFU lecture.](#)
- [Fostering climate conversation between faith groups, business leaders, policymakers and academics; Laudato Si + 1: Faith, Business & Climate Change, PICS SFU Lecture.](#)
- [The potential role of the forest sector in climate change mitigation, PICS UNBC lecture.](#)
- [Wildlife Ecosystem Resilience in the Context of Climate Change: A Kootenay Case Study, PICS UVic Lecture](#)

Events coming up...

- Two talks at UVic by Dr. Kris Ebi: Feb 1st, 2017 - [The health risks of a changing climate](#) and Feb 2nd, 2017- [Implications of future development pathways for the risks of climate change](#)
- [Renewable Cities Global Learning Forum](#) May 17-19th, 2017.

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