



SPRING 2013



PICS is hosted and led by the University of Victoria in collaboration with the University of British Columbia, Simon Fraser University and the University of Northern British Columbia.

Divorcing Dow Jones from King Coal

Crossing symbolic thresholds can powerfully remind us of trends. In May we saw examples of both: the Dow Jones Industrial Average closed above 15,000 on May 7 and the concentration of carbon dioxide (CO₂) in the Earth's atmosphere surpassed a daily mean of 400 parts per million (ppm) on May 9. Neither threshold had ever been crossed before in all of human history. But only one of them can be viewed as welcome.

When the Nobel Prize winning Swedish chemist Svante Arrhenius wrote in 1896 about coal burning and future global warming, he saw 400 ppm as possible centuries ahead. He was wrong, only due to the unforeseen vast expansion of fossil fuel use in the 20th Century. In Arrhenius's day, the atmospheric CO₂ concentration had crept up to about 290 ppm from 260 ppm at the end of the last ice age 10,000 years earlier. It took just over one more century to jump another 30% and reach the 400 ppm threshold. By any yardstick, that's a staggering rate of increase, one not seen on Earth for at least 800,000 years.

Every major media outlet in the world reported the 400 ppm measurement, and the Dow's milestone received the most attention in North America. But no mainstream press noted that both thresholds were crossed a mere two days apart. While this is a coincidental convergence, it is also highly revealing, for industrial growth is fundamentally associated with high-energy demand and the resultant burning of fossil fuels, which is driving global temperature inexorably upward.

Our challenge now is to break the nearly 200-year-old relationship between industrial growth and fossil-fuel combustion before we close in on the next major CO₂ milestone. Getting there demands that we chart a new course. We must divorce growth in the Dow from reliance on King Coal.

Putting a price on carbon emissions is one such approach. As described in this newsletter's next article, on June 4 PICS sponsored at the University of Victoria (UVic) a public panel discussion on the benefits of carbon taxation in British Columbia (BC). The panel's three experts noted that the carbon tax has contributed to a measureable decline in fossil-fuel consumption in BC while the economy of the province has grown at a rate faster than the Canadian average. BC is taking a tentative first step toward disconnecting GDP growth from fossil fuel consumption.

In that context, the theme chosen for this year's PICS Forum on June 12-13 is "Converging on Solutions". Day 1 will offer a retrospective view of research results to date, now that PICS has about three years of work under its belt. Day 2 will bring together leaders from various political, public, environmental and regulatory backgrounds. Our goal is to find common ground on how Canada can meet its energy needs while addressing the climate change challenge.

This year we are very pleased to have the Globe and Mail's national affairs columnist Jeffrey Simpson and the former Leader of the Opposition Hon. Preston Manning speak to "Canada's Energy Future" at a free public event as part of the forum. Both prominently acknowledge that there need be no conflict between continued economic growth and lower CO₂ emissions—it's **not** the Dow versus carbon dioxide. That's the message that we hope will foster common ground at this year's forum. See the events calendar at www.pics.uvic.ca

Congress 2013: BC's carbon tax is driving down emissions



Congress 2013: Ekaterina Rhodes, Stewart Elgie, James Mack, Tom Pedersen

Why not directly target the big-spending and big GHG-emitting military instead of the "little guys" when it comes to taxing polluters? That crowd-pleasing question from a UVic graduate and local taxi driver was one of many directed at a

PICS-hosted expert panel on BC's carbon tax held during Congress 2013 at UVic on June 4.

Panelists Stewart Elgie, professor of law and economics at the University of Ottawa and founder and chair of the green economy think-tank Sustainable Prosperity; James Mack, head of BC's Climate Action Secretariat (CAS); and Ekaterina Rhodes, an SFU Ph.D candidate and Vanier Canada Graduate Scholar, presented the latest in research on BC's groundbreaking Carbon Tax, and fielded questions from the floor. PICS executive director, Tom Pedersen, moderated the event.

Coming five years after the introduction of the tax in 2008, the panelists had plenty of evidence to show that the levy is helping to lower GHG emissions, while also reducing taxes. Per capita fuel consumption in BC has dropped an impressive 16 percent since the carbon tax was introduced in 2008 (faster than all other provinces), while the provincial economy has grown faster than the Canadian average. New research also shows that the highly publicized, scheduled annual increases in the tax appears to have had a far greater psychological impact on BC consumer habits than in Ontario, where price hikes at the pump (due to the HST) were sudden, rather than gradual. Yet it seems British Columbians still have a lot to learn about their carbon tax, with yet-to-be published research by Rhodes showing that 73% of voters can't name any of BC's climate policies unless prompted.

A recording of The Benefits of Carbon Taxation event is available on the PICS website. June 4 also saw the publishing of the Vancouver Sun Op Ed, *BC's carbon tax is driving down emissions*, by Pedersen and Lee Thiessen, former CAS executive director of climate change policy. The article was also picked up by the Calgary Herald. See PICS in the News online.

2013 PICS Internships Awarded

PICS is pleased to announce the funding of 10 new internships for the upcoming year. These internships, hosted by organizations located around the province, are made available to students who will be returning to school in the fall to one of the four PICS universities (UVic, UBC, SFU and UNBC). Organizations who will host a PICS intern this year include the Ministry of Energy and Mines, West Coast

Environmental Law, the Regional District of Wells, the Pembina Institute, and the World Wildlife Fund to name a few. From investigating the bio-energy economy in the Kootenays to planning for district energy in the North, the PICS internships span the province and seek to build solutions to the challenge of climate change. The 10 hired interns will receive \$10,000 base funding from PICS, with most positions typically running for three-to-four months this summer/fall.

Internship in Action

Finding practical solutions to real climate challenges in southern Vancouver Island was among the positive outcomes from a three-month PICS internship that wrapped up this spring. Julia Berry, a UVic fourth year student, was hired by the Capital Regional District (CRD) to support community efforts in its Climate Action Program.



Julia Berry

During the internship Julia coordinated the "Ready, Set, Solve: the Student Climate Challenge." This contest connected 18 teams of students from UVic, Camosun College and Royal Roads University with climate change issues facing municipalities, non-profits and institutions in the region. Their projects included investigating sustainable transportation options, rainwater management, mapping ecologically sensitive lands, reducing GHG emissions, creating education programs and local food production policy, and reducing wastes, including eliminating paper towels from campus waste.

Julia also synthesized data on regional greenhouse gas emissions and energy use, researched carbon offset purchasing opportunities and drafted education materials on climate change adaptation. Julia is now working in the sustainability field for the City of Calgary.

Going Electric – PICS plugs in

This spring has seen each of the four PICS universities further support the growth of Electric Vehicle (EV) uptake in British Columbia, with a mix of new EVs and charging stations operating on campus.

With financial assistance from the Clean Energy Vehicle Program's Academic Fund, UNBC has purchased five small electric trucks from UBC for use by staff. Small electrical meters (sponsored



The fast - and the compact - charge up at UBC

by PICS) were also bought for analyzing the power usage

data. The project has allowed the removal of several gasoline-powered vehicles that had a fuel cost of approximately \$4,100/year. In comparison, the cost of running the electric Might-E trucks will be approx. \$270/year. Over the next five years UNBC has the potential to save up to \$19,200 in fuel costs and over 35 tonnes of CO₂e emissions (valued at \$875 in offset costs). A final report will be produced that analyses the acceptance, promotion and fit of the vehicles at UNBC, as well as the installation costs, electricity use, maintenance costs, range, and carbon emissions saved.

Meanwhile, 23 new electric vehicle charging stations – both free and user-pay– started operating this past April on the other PICS campuses. UVic and SFU's Burnaby campus respectively now have two and three new charging stations, thanks to funding from the BC government's Community Charging Infrastructure Project. And UBC has just added 18 new stations under its EV Infrastructure Project.

Climate scientists draw big audiences

Extreme weather research drew strong turnouts to the PICS-hosted free lectures featuring top American climate researchers, Dr. Jennifer Francis and Dr. Martin Ralph. The events – held respectively on February 26 and March 6 at the University of Victoria - attracted nearly 200 people plus online viewers, as well as considerable media coverage.



Extreme weather in California affects Richmond food supplies

change in that region, as a culprit in fueling the increase in extreme weather. "Arctic warming...is affecting the jet stream around the northern hemisphere, with potentially far-reaching effects on the weather, including the recent heat waves, floods, and storms we are seeing in the northern hemisphere."

Extreme weather events were also the topic of Dr. Ralph's lecture, which focused on advances in recognizing and predicting the behavior of atmospheric rivers (ARs) on the Pacific west coast. These rivers in the sky can carry as much water as 15 Mississippi Rivers, and can cause major

devastation. He explained how recent advances in modeling and sharing data are helping to provide more accurate forecasts of when, where and for how long these downpours will occur. Dr. Ralph is from the National Oceanic and Atmospheric Administration (NOAA). Recordings of both lectures are available on our website.



Students at a PICS energy workshop

Education outreach

PICS education outreach has taken both hands-on and virtual approaches this spring with the launch of its latest Climate Insights video and a series of workshops at SFU.

Hundreds of school students took the opportunity to learn about "green energy" generation and try out the PICS interactive climate change educational tools on the Burnaby campus. Students from Westview Secondary and Maillard Middle School participated in the four "Exploring Energy: Conversion, Consumption and Conservation" workshops held on April 22 (Earth Day), and April 24. Using wind, sun and water as power sources, students generated electricity and learned about the importance of conserving energy. PICS was also part of SFU Science Rendezvous 2013 on May 11th, with many of the 1000-plus attendees visiting the PICS booth.

An important tool for education outreach is the "Clear the Air" video series created by PICS that explains why climate change is happening, and what we can do about it. June 4th saw the launch of the latest video – Carbon Tax and Cap and Trade. Advancing public awareness and understanding of climate change is a key priority at PICS. These videos are available free online.

PICS joins 3-Minute Thesis contest

Explaining your research project to a non-specialist audience can be tricky – and trying to do this in just three minutes is even tougher. But that is what Masters and PhD students at SFU took on this year when they joined the Three Minute Thesis (3MT) academic competition that started in Australia in 2008 but is now held around the world.

PICS SFU hosted its first "Climate Solutions Heat" as part of that event, with six graduate students competing for the \$300 prize. Mary Ann Middleton, a PhD candidate and PICS fellow, in the Department of Earth Sciences won the first place with a

summary of her work, "Groundwater-surface Water Interactions". Amin Nouri, a Ms candidate in Chemistry, took second place and the people's choice award with a presentation entitled "Electrocatalysis in hydrogen fuel cell".

PICS looks forward to future entries in what will now be an annual event

aimed at improving graduates' communications skills and research awareness.



PICS researcher Erica Crawford talks to Goba! TV Top Story host Aaron MacArthur

in emissions reductions, with significant savings on transport, electricity, heating and waste-disposal bills. Projected payback periods averaged at 2.3 years. The 11 organisations profiled are collectively now saving nearly

\$300,000 a year, plus achieving annual emissions reductions of more than 485 tonnes CO₂e.

That message resonated with media, with the story leading the Vancouver Sun business section and Business in Vancouver magazine launched a series based on the results. Radio networks also picked up the issue, and Climate Smart received more than 500 hits on its site, resulting in more business and more companies "going green."

PICS researchers Erica Crawford and Rachelle Beveridge also struck a chord among British Columbians with their report showing how the province's agriculture sector is under major stress, especially with climate change being added to the picture. The white paper, "Strengthening BC's Agriculture Sector in the face of Climate Change," is the result of interviews with BC agricultural producers and specialists. After demonstrating that the past climate is no longer a guide to the future, the authors spelled out ways that policy-makers could help the farming sector survive into the future. Recommendations include changing current governance structures so policy makers are in touch with what's happening on the ground, improving the resources available to farmers, and supporting climate change innovation and preparedness on farms.

As spokesperson, Erica was interviewed by CBC Vancouver News, Global News Top Story, BC Almanac, the Globe and Mail, the Vancouver Sun, News 1130, CFAX radio, All Points West, OMNI news (Punjabi edition), CBC radio news, and the Q radio. PICS would like to thank the BC Agriculture Council's media statement welcoming the report which helped raise the profile of the research.

Canada-China Energy workshop

The 4th annual Canada-China Clean Energy Conference – "Sustainable Transportation" – was organized by the Institute for Integrated Energy Systems (IESVic) and held in Victoria on April 29-30, 2013. The general purpose of the conference was to identify effective ways and new opportunities for collaborative research among participants and industry from both countries.

The year's event reviewed current transportation technology and looked at future research to make the sector sustainable. The conference was sponsored in part by UVic VP Research and PICS. A workshop on "Low Carbon Public Transportation" was also held. The next Canada-China energy Workshop is slated for May 2015 in Shanghai.

PICS white papers gain widespread news coverage

Two new PICS white papers released this spring gained widespread traction in the news media and also among businesses keen to save money while helping the environment.

The paper "Are small-to-mid sized businesses the catalyst to a low carbon economy in BC?" was produced by the Vancouver-based social enterprise, Climate Smart, which trains organizations to measure, manage and reduce their greenhouse gas (GHG) emissions. Their number crunching revealed an impressive 43% rate of return on the organizations' investments

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