Pacific Institute
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PICS*news*

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From the Executive Director

Going electric

All-electric zero-carbon-emission cars have been in the news a lot lately. Tesla, maker of the up-market Tesla S sedan, hit the headlines in spring when it announced at the end of the first quarter that it had turned a profit. In the summer, profits rose further and the stock market responded. After coming onto the market in mid-2010 at about $20, at the end of September Telsa's share price neared $195 before settling back to its current level ($175 on Oct. 8). The company has clearly found a niche––despite its high price (about CAN $120k) Tesla is racing to keep up with demand for the top-of-the-line "S"; if you order one today, you'll need to wait some months before it will grace your driveway.

Meanwhile, downmarket by about $90k, Nissan is setting sales records for its all-electric Leaf, first introduced in 2010 in Japan. After an initial slow uptake, it too has found a market. Over 80,000 Leafs are now on the road worldwide, and Nissan, like Tesla, can hardly meet demand. Sales in 2013 are up 210% over 2012 in the United States (US). Nissan has built new factories to produce the car in England and Tennessee, and another is under construction in China. The company appears to have an electric winner on its hands.

But do electric cars offer environmental––or even economic––value? Certainly, how the electricity that powers them is generated will make a difference in quantifying net environmental impact. The Japan Environmental Management Association for Industry calculates that the Leaf reduces lifecycle CO_2 emissions by 40% relative to a gasoline powered vehicle of similar size. But 60% of Japan's electricity is produced by burning coal, gas or oil, so the lifecycle CO_2 emissions reduction of a Leaf driven and charged in British Columbia (BC), where 92% of the electricity supply is met by hydropower, will be far superior in comparison. What about the batteries? Li-ion battery cells do lose charge capacity with time and need to be replaced. Spent cells are readily recyclable, but it is currently five times cheaper to use lithium carbonate derived from salt deposits to make new batteries than to use recycled Li. Until lithium economics change, the best option for spent batteries it to repurpose them as components in large-scale electricity storage systems, where loss of some charging capacity is less of an issue.

Finally, does the purchase of an all-electric vehicle make economic sense to a consumer? I'll use me as an example. At the start of this year, I traded in my 12 year-old Civic for a 2012 Leaf. I've since driven 13,000 electric kilometres, and based on average fuel costs versus charging rates, I have already saved more than $1000. In addition, electric cars require no oil changes, no oil filters, no spark plugs, no fuel-injector adjustments and no exhaust pipes or mufflers. In total my operating costs will be about $1800 less a year. So while the Leaf costs more to buy than a new Civic, within 10 years I should come out on top, even if the battery needs replacing. I'm not alone in this conclusion; the Electric Power Research Institute in the US forecasts a $7000 net saving for an all-electric car driven 240,000 km relative to a conventional gasoline-powered vehicle of the same size. That comparison is an underestimate locally, given the higher gas costs and cheaper electricity in BC.

A zero-emissions Nissan Leaf parked outside the PICS office.

So, joining the electric revolution is now a realistic option. And as technology continues to improve and more renewable power feeds into the grid, that option will become increasingly attractive for anyone seeking to reduce his or her emissions. And a big plus is that it can make economic sense, too.

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.

Strong turnouts for briefings on the IPCC's AR5

Around 800 people took the opportunity to find out more about the global and regional implications of the Intergovernmental Panel on Climate Change's (IPCC) Fifth Assessment Report (AR5) by participating in the two special briefings hosted by PICS and the Pacific Climate Impacts Consortium (PCIC).

The first public event was held in the Vancouver WOSK Centre on Monday 30 Sept - the day that the full AR5 report from Working Group I (WG I) became available. The second briefing was held two days later in Victoria, and was restricted to civil servants.

Taking audience questions: IPCC Fifth Assessment briefing panel in Victoria, (LtoR), Greg Flato, Francis Zwiers and head of CAS, James Mack.

The IPCC has three working groups: WG I deals with the physical science basis of climate change, Working Group II with the impacts and adaptation, and Working Group III with mitigation. The latter two assessments will be released in 2014.

The briefings included presentations from PCIC director and vice chair of WG I, Francis Zwiers, and from Greg Flato, the coordinating lead author of the AR5's Chapter 9 "Evaluation of Climate Models" and manager and research scientist with the Canadian Centre for Climate Modelling and Analysis (CCCMA) of Environment Canada. Both audiences were offered insights into how the IPCC assessment process works, the current extent of global climate change and what the future holds. A total of 10 Canadian scientists were involved in the 259-strong body of scientists that contributed to Working Group I – with seven of those 10, including Zwiers and Flato, hailing from Victoria.

New PCIC research was also presented on climate change in British Columbia (BC). While BC's regional climate is highly variable, in part due to events like El Niño and La Niña, average temperatures have trended upward since 1900 in both the summer and winter months. Using a moderate emissions scenario, (the IPCC's RCP4.5), temperatures are projected to continue increasing, by about 2.9 °C in the winter and 2.4 °C in the summer by the year 2100. Precipitation patterns are harder to pin down, primarily due to variance, and there being much less rain gauge data from the earlier 20th Century. However, one change that is thought to be already having ecological and economic effects is the number of frost-free days, which has declined by 24 days since 1900. Under this moderate emissions scenario, a further decrease of 31 additional frost-free days is projected for 2100 – a significant difference of more than seven weeks. See PICS media release for more details.

The Vancouver audience - comprising 180 attendees plus another 435 individuals and groups watching the live webcast - included academics, NGOs such as the World Wildlife Fund and the David Suzuki Foundation, members of the public and media, plus viewers from many Canadian settings including Whitehorse and Ottawa. The Climate Action Secretariat (CAS)-led event in Victoria attracted a capacity crowd of more than 170 with staff attending from 12 different ministries, plus representatives from local government and federal departments. The Vancouver briefing is now available on the PICS website.

What YOU can do about climate change video

Reducing your carbon footprint got easier with the summertime release of a new online video that uses animations and humour to teach people how they can help prevent global warming. The "What YOU can do about climate change" 10-minute video is the latest in a series of free educational products in the PICS "Climate Insights 101" series.

Viewers are taught how a carbon footprint is calculated, and how they can be part of the climate change solution. E.g. An estimated 40% of food in Canada is wasted between farm gate and table, thus creating the harmful gas, methane in landfills. One solution? Eat your leftovers. Also, reduce food transport GHG emissions by planting a garden and buying local produce. Take "staycations" rather than overseas vacations, and travel by rail or car-pool. And a heads-up: new online modules on the topics of "Mitigation" and "Regional Climate Change and Adaptation" are scheduled for late 2013 and spring 2014 respectively. Both are key elements of the online Climate Insights short-course series.

"Converging on Solutions" PICS Annual Forum

The idea of seeking common ground to build a new Canadian national energy strategy was the foundation of talks held during PICS fifth annual forum held in Vancouver June 12-13. Day 1 of the "Converging on Solutions" conference focused on PICS research accomplishments to date, followed by a full house that evening for the free public discussion on "Canada's Energy Future" at the Goldcorp Centre for the Arts. The

keynote speakers, former Leader of The Opposition Preston Manning and Globe and Mail national affairs columnist Jeffrey Simpson, shared their common belief that a price must be put on carbon to affect behavioral change and lower greenhouse gas emissions. Manning advocated a range of tools be used to communicate climate change - saying that Conservatives respond to using full cost accounting to cover the cost of mitigating or remediating emissions, but it is local impacts such as melting permafrost and ice-roads that cause bottom-up democratic support for climate action. The legacy argument would also sway grandparents, he argued. Meanwhile Simpson who co-authored the 2007 book "*Hot Air: Meeting Canada's Climate Change Challenge*", said the environment is consistently losing out to the economy as a political priority, and this was unlikely to change without federal leadership and international engagement. A webcast of this event is available in the PICS online archive.

A keynote speaker for the 2013 PICS annual forum, the Honourable Preston Manning.

Day 2 saw the discussion around "Finding Common Ground in Canada's Energy Future" carried on by an experts panel featuring keynote speaker David Stern, senior energy forecaster for Exxon Mobil; Alex Ferguson, Vice President Policy and Environment, Canadian Association of Petroleum Producers; Kathryn Harrison: Professor of Political Science at UBC: the Hon. Manning, and Simpson. The forum attracted radio and print media coverage including The Bill Good Show, CBC Early Edition, Business in Vancouver and the Vancouver Observer.

PICS presentations: UK and Ecuador

British Columbia's leadership on climate action was the impetus for invitations for PICS to present at two overseas events this summer. On July 28 to August 2, Sara Muir Owen, PICS UBC coordinator, joined the Oxford Round Table on Critical Public Issues and presented a talk on *BC's Climate Action Plan: Six Years of Leadership and Learning*. Other talks included *Climate Change: The Role of the World's Cities* by Avi Gottlieb, Professor, Department of Sociology, Tel Aviv University, and Professor Matsuhashi on *Green Innovation and Green Growth to Realize an Affluent Low-Carbon Society* and Professor Khalil on *Waste as a Liability to Waste as a Sustainable Energy Source* from, respectively, the University of Tokyo and Yale University. A common theme through almost all topics was the importance of the community-scale in addressing global challenges, with presenters offering examples of effective local and regional programs as success stories.

PICS SFU Coordinator, Nastenka Calle, had the opportunity to share BC's climate action initiatives while visiting her home country Ecuador this past summer. Guayas, a province of Ecuador, has recently finished the first phase of its Provincial Climate Change Strategy on Climate Vulnerability Assessment, and is now working on a strategic plan. Highlights of Calle's talk included the BC Government's carbon tax, adaptation steps and its carbon neutrality program. How PICS is supporting these measures and others through research was described as British Columbia works to mitigate and adapt to the consequences of climate change.

Nastenka Calle, PICS SFU Coordinator, during her visit to Guayaquil- Ecuador.

White paper: Bioenergy from wildfire control

A new tool that helps rural communities determine if the debris left from wildfire abatement work can produce sustainable local energy caught the imaginations of BC residents when announced by PICS in mid August. Details of the Fire Interface Rural Screening Tool for Heating – FIRST Heat – are contained in the PICS white paper, "Fire in the Woods or Fire in the Boiler?" by researchers Juan Blanco & Dave Flanders (UBC), Dale Littlejohn & Peter Robinson (Community Energy Association, CEA), and David Dubois (Wood Waste to Rural Heat Project).

Media that picked up on the story include the Vancouver Sun, the Kamloops Daily News, CBC Day Break Kelowna, CBC On the Island, industry press and CFAX radio. Spokesperson Dale Littlejohn said controlled burn-offs for wildfire prevention could be a thing of the past, if that waste-wood was used to fuel district heating systems (DHS) instead. The FIRST Heat tool provides the first step in calculating the suitability of local forests to supply that resource. "Out-of-control wildfires cause huge economic damage, and this research shows that a DHS can reduce that risk while providing cheap, clean energy generation and local jobs." The new spreadsheet tool is available for use on the CEA website.

PICS research goes international

The research of PICS fellow Jennie Moore has been gaining international attention. In April she was in Washington DC for the launch of the Worldwatch Institute's State of the World 2013 report. Moore is a contributing author along with her thesis supervisor, UBC Professor Emeritus William E. Rees. Their chapter, "Getting to One Planet Living" examines the sustainability gap between how much the average Vancouverite consumes today and what would be needed to stay within global ecological carrying capacity. "If 'one-planet' living is the goal, then lifestyle choices will obviously have to entail more than recycling programs and stay-at-home vacations," says Moore, who is also director of Sustainable Development and Environmental Stewardship at the BC Institute of Technology.

Moore has published a wide range of articles, some of which are featured on the PICS website. Her dissertation research, which she successfully defended in July, is also being used by the City of Vancouver to inform its Greenest City 2020 Action Plan. September saw her presenting at the Ecocity World Summit in Nantes Frances, where she is working with Ecocity Builders to develop the International Ecocity Framework and Standards.

PICS fellow Jennie Moore

Science at UNBC kids' summer camps

Finding out how solar energy works was part of the science knowledge that PICS brought to the UNBC's Active Minds kids camps held in Prince George this past summer. Camps included "Green World" and "Science Past, Science Future" – the former teaching children ways to reduce their carbon footprint, help keep the air clean and maintain the natural environment. The latter focused on technology, from smart phone apps affecting our lives to using robots to perform various tasks.

PICS-UNBC Program Coordinator Kyle Aben brought discussion on climate change to the Active Minds camps, by exploring the positive attributes of renewable energy and ways to combat global warming. Students also got to build "brush bots" using the motor of a cell phone to make a toothbrush buzz, as well as test-drive their own "smallest solar car in the world," courtesy of PICS.

Active Minds camp uses human-cranked motor to mix up a smoothie at UNBC.

Farewells and welcomes….

This summer has seen some sad farewells in the PICS community, with the departure of EA Wendy Phelan to greener pastures and snowy slopes of the Kootenays, and the resignation of Nancy Olewiler, Monika Winn and Ken Wilkening from the Program Committee. Their collective hard work and immense contributions to PICS will be sorely missed. However PICS is privileged to welcome new Program Committee members Stephanie Bertels (SFU Business), Robert Gifford (UVic Psychology) and Zoe Meletis (UNBC Geography) , and Nancy Chan as the new EA. PICS is also fortunate to be retaining the expertise of Nancy Olewiler, who is leading PICS' new research project on liquified natural gas.

Wendy Phelan
we miss you!

Coming Up ...

This fall PICS is hosting a new lecture series to showcase results of the 33 projects it funds across the four consortium universities. Visit the PICS event calendar for details on upcoming lectures or the video archive for past talks.

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