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## MEDIA RELEASE

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### Major funding boost for BC-led climate change research

The Pacific Institute for Climate Solutions (PICS) is pleased to announce \$1.8 million in new funding for British Columbia-led projects aimed at finding solutions to the environmental, social and economic challenges, and opportunities, brought about by climate change.

PICS is a collaboration of BC's four-research intensive universities—the University of Victoria (UVic), University of British Columbia (UBC), Simon Fraser University (SFU) and the University of Northern British Columbia (UNBC)—hosted and led by UVic.

PICS Executive Director Dr. Tom Pedersen says the institute's collaborative nature sets it apart from other research bodies because it brings together top minds—from what can be competing organizations—on specialist climate change topics.

"The 27 new research projects we are announcing today are living proof of this collaboration, with the majority of the project teams involving inter-university researchers as well as experts from within government, the private sector, and other research bodies," he says. "Such collective intellectual effort will help ensure BC has the sound research base it needs to develop innovative climate change policies, and to ensure its ongoing leadership in this crucial area."

Project durations range from eight months to 2.5 years and come under one of the PICS research themes: the low carbon emissions economy, sustainable communities, social mobilization, and resilient ecosystems.

Research topics include:

- determining the next best steps for BC's groundbreaking Carbon Tax
- using solar energy to turn the greenhouse gas (GHG) carbon dioxide (CO<sub>2</sub>) into a clean energy fuel
- investigating opportunities to reduce GHG emissions and create green jobs through zero waste policies
- designing a framework for dealing with the employment impacts of the shift to a low-carbon economy
- determining if BC's luxury tax steered motorists towards cheaper, smaller and more fuel-efficient vehicles
- investigating whether energy from ocean waves can be a viable electricity source in BC
- creating a new computer tool to help local governments 'test drive' their energy and emissions planning
- analyzing social media's effectiveness at mobilizing youth to reduce energy consumption
- development of tools and better management systems to safeguard BC's forests and fisheries, and
- maintaining biodiversity in BC's mountains which are tipped to lose up to 97 % of alpine habitat by 2085

Pedersen says the breadth of this research reflects the need to expand mitigation efforts to include adaptation. "The impact from human-caused climate change will increasingly be felt across our environment, our economy and our way of life, from the food we will be able to grow in future through to our willingness as a society to wean ourselves off carbon and move to a renewable energy sector. Research needs to encompass all these aspects."

Research projects under a fifth theme – carbon management in BC forests – will be announced later this year. The attached backgrounder describes the 27 research projects and their institutional composition. For more information or to arrange interviews with Pedersen or project leaders please contact PICS communications.

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## **Backgrounder: 2010/11 PICS Research Theme Funding Announcement**

**More detailed project descriptions are available at [www.pics.uvic.ca/research.php](http://www.pics.uvic.ca/research.php).**

### **Theme 1: The Low Carbon Emissions Economy**

#### **Next steps on BC's Carbon Tax: assessing alternatives and searching for common ground**

Decisions are pending about the future of BC's carbon tax. This project will explore the design of alternative carbon tax policies for post-2012 through a mix of interviews, polling and economic modeling.

*(Project team: Simon Fraser University, Pembina Institute)*

#### **Accelerating GHG reductions in BC's economy**

BC has ambitious policies to achieve deep cuts in greenhouse gas (GHG) emissions. These policies include carbon taxes; technology subsidies for carbon efficient equipment, and the carbon neutral government mandate. This project assesses these policies and, working with the government, aims to provide further support for BC residents and organizations to reduce their GHG emissions while maintaining prosperity and wellbeing.

*(Project team: University of British Columbia)*

#### **Closing the loop: opportunities to reduce GHG emissions and create green jobs through zero waste policies**

This project investigates the potential for green job creation and GHG reductions through attempts to "close the loop" on economic production involving energy and material flows. Consistent with the ideal of "zero waste", the reprocessing of recycled materials can lead to dramatic reductions in energy use (and thus GHGs) compared to raw materials. It also represents an opportunity for green jobs associated with (i) integrated and harmonized collection programs, (ii) sorting and processing depots, and (iii) domestic recycling and remanufacturing of material inputs.

*(Project team: University of British Columbia (UBC), UBC Okanagan, Canadian Centre for Policy Alternatives, Wilderness Committee, Canadian Union of Public Employees, EcoInspire Planning Services)*

#### **Development of novel nanostructured photocatalysts for highly efficient solar reduction of carbon dioxide to clean energy fuels**

Turning the GHG carbon dioxide (CO<sub>2</sub>) into a clean energy fuel is a potential innovative solution for both the future shortage of fossil fuels and the global warming problem. This project will look at new catalysts for the conversion of CO<sub>2</sub> into fuels with the help of solar energy, a clean and renewable energy source. Such a process would help convert and remove industrially generated CO<sub>2</sub>, and allow for the geo-engineered removal of CO<sub>2</sub> from the air.

*(Project team: University of British Columbia)*

#### **Flogging a dead policy: estimating the environmental impact of the Luxury Vehicle Surtax in BC**

This project aims to answer: did BC's Luxury Vehicle Surtax steer consumers towards cheaper, smaller and more fuel-efficient vehicles? This study will compare sales in the taxed and non-taxed categories of vehicles from other provinces to sales in the corresponding categories in BC, as well as sales in BC over time as the tax threshold varies. The results will reveal the impact of this tax on different vehicle categories and provide important lessons for policymakers across the world considering the benefits/costs of a broad range of luxury taxes.

*(Project team: University of British Columbia, University of Chicago)*

#### **Just transition in BC: a framework for dealing with the employment impacts of the shift to a low-carbon economy**

Fear of job loss could have a paralyzing impact on the transition to, and acceptance of, industrial production with major GHG emissions reductions. This project aims to develop a framework for labour market transitions. It will review best practices in other jurisdictions, and case studies from past labour market transitions and planning in BC and the rest of Canada. It will engage directly with people working in affected industries about the terms for a fair deal, and show what a just transition should look like.

*(Project team: UBC Okanagan, Canadian Centre for Policy Alternatives, Communication, Energy and Paperworkers Union)*

### **Experimental validation of the performance of wave energy converters of the point-absorber class**

Wave energy is often cited as an important part of our renewable energy sources portfolio, yet we lack precise information about the opportunities it offers. This project will use numerical models and testing of scaled physical models, (structured to replicate wave conditions observed off the coast of Vancouver Island), to determine how a type of wave energy converters, called point-absorbers, can serve BC's electricity demands. Physical models will be fabricated at UVic and operated in a wave tank at the Ocean Engineering Research Centre at Memorial University of Newfoundland.

*(Project team: University of Victoria)*

### **Wind turbine design and siting for unsteady conditions**

BC is home to one of the largest Canadian producers of small wind turbines (<100kW). These machines can provide enough electricity to power consumers' homes and businesses. However a better understanding of the conditions they need, and how to design for them, is vital to improving technical performance and cost effectiveness. This project will develop computer-based design and simulation tools for small wind turbines, and compare the results with actual operating machines outfitted with monitoring equipment. The goal is to produce better performing machines and deploy them in a wider range of location types than is currently possible.

*(Project team: University of Victoria)*

## **Theme 2: Sustainable Communities**

### **A community energy and emissions simulation model**

This project will develop a user-friendly computer model to facilitate energy and emissions planning by local governments, building their capacity to reduce GHG emissions and contribute to a sustainable energy future. The model will be freely available, operated by local governments, and capable of simulating the effect of policies and actions on the energy consumption and emissions of any BC community.

*(Project team: Simon Fraser University, Nanaimo Regional District, Sunshine Coast Regional District)*

### **Integrated community sustainability planning: implications for rural BC**

BC local governments representing small communities, rural and remote areas are grappling with how to conduct their required integrated community sustainability planning (ICSP) processes. The limited information available on rural sustainability is US-based, and most literature on community sustainability is urban focused – e.g. improved transit, densification, and mixed land use in cities. This research project will directly address this knowledge gap, focusing on sustainability planning processes for BC rural communities and landscapes.

*(Project team: Fraser Basin Council)*

### **Toward Sustainable Communities: The Living Edition**

This project involves a comprehensive update of the made-in-Canada *Toward Sustainable Communities* resource guide. Content enhancements, plus a set of complementary digital companion pieces that aid sustainability analysis, will point readers to current BC-relevant sustainability resources, and deliver the book's message in innovative new formats. This 20<sup>th</sup> anniversary fourth edition, due for release in spring 2012, will trace the rapid growth of this field over the last two decades, and set the stage for future sustainable community development.

*(Project team: Simon Fraser University)*

### **Sustainable Communities Research Network**

The Sustainable Communities Research Network (SCRN) will be a bridge between researchers and local government practitioners comprising several supports, including journals, conferences, publications, and a web-based network platform. The network will focus on catalyzing sustainable development at the local level in British Columbia and beyond. The SCRN is scheduled to launch in BC this fall, and then expand nationally and globally in spring 2012.

*(Project team: Simon Fraser University, BC Climate Action Secretariat)*

## **Theme 3: Social Mobilization**

### **Greenest City Conversations**

Greenest City Conversations (GCC) is a multi-partner research project aimed at fostering and evaluating public engagement on sustainability policies. Its two goals are (1) to create discussion and analyze public attitudes towards sustainability policies; and (2) to assess the impacts of different modes of public engagement including digital media, scenario visualization, mobile applications, tabletop games, and art performances.

*(Project team: University of British Columbia, Simon Fraser University, City of Vancouver)*

### **A day in my carbon neutral life**

What we can do as individuals to reduce our carbon footprint can be significantly limited by the world we live in — for example, where we can afford to live, how the goods we buy are produced and what transportation systems exist. Through a reality-TV style multimedia production, this project will explore the changes needed to get there. This project — which profiles real BC families from different income, cultural and geographic backgrounds — will help demystify the changes needed in how we live, work, play and move around, if BC is to become carbon neutral.

*(Project team: Canadian Centre for Policy Alternatives, University of British Columbia, Simon Fraser University, David Suzuki Foundation, Pembina Institute, SAP Canada, BC Healthy Communities, Vancity)*

### **Measured visualizations as catalysts for mobilization**

Researchers will work with Revelstoke community residents to imagine how their communities might change over the next 30 years. Based on the characteristics of the neighbourhoods that residents envision, researchers will use computer models to calculate how much energy the communities might consume in the future. The work will ultimately help Revelstoke and other cities throughout BC to plan for a more efficient future that requires less, rather than more, energy, without compromising quality of life.

*(Project team: University of British Columbia, City of Revelstoke)*

### **Understanding the public uptake and acceptance of a municipal green energy incentive program**

Communities need to find innovative ways to influence household choices related to energy sources and consumption if targets for reducing GHG emissions and other sustainability goals are to be met. The City of Colwood's "Solar Colwood" project seeks to have 1,000 homes plus local businesses install solar thermal water heating systems and other clean energy upgrades by 2014. This research will examine methods, incentives and tools used to develop uptake in the community, and will examine the response to the project by the population.

*(Project team: Royal Roads University, City of Colwood)*

### **From communities of interest to communities of practice**

A team of UBC researchers has partnered with goBEYOND, a non-profit campus climate action initiative, to promote reductions in energy consumption in student residences on BC campuses using social media. The research will use interviews and focus group discussions to examine the degree to which social media tools such as YouTube, Facebook and Twitter can be used to mobilize young people to value energy more and reduce their every day energy consumption.

*(Project team: University of British Columbia, goBEYOND Campus Climate Network)*

## **Theme 4: Resilient Ecosystems**

### **Impacts of climate change on natural disturbance regimes in British Columbia: planning for adaptive forest management solutions**

This research will improve understanding of BC interior Douglas-fir ecosystems response to western spruce budworm outbreaks, the most damaging pest after the mountain pine beetle. The project will evaluate how climate change affects the ground rules for ecosystem management, providing key insights into current stressors and the likelihood of interior Douglas-fir forest persisting and adapting in a time of change.

*(Project team: University of Victoria, Canadian Forest Service, BC Ministry of Forests, Lands and Natural Resource Operations)*

**Understanding ecosystem responses to climate change in southwestern British Columbia forests: a paleoecological perspective on resilient ecosystems**

This research aims to understand how Douglas-fir forests and Garry oak savannas on southern Vancouver Island and the Gulf Islands have adapted to climate change and fire frequency over the last 10,000 years. Researchers will use fossil pollen and charcoal preserved in lake sediments to determine forest community response. This long-term perspective is crucial for understanding ecosystem responses to future climate change, and will help scientists to more effectively guide management of remaining forests and savanna communities in south western BC.

*(Project team: University of Victoria, Parks Canada)*

**Assessing the potential aquatic habitat value of streams responding to a changing climate**

This project will produce numerical models predicting the impacts of climate change on potential fish habitat in BC streams, based on forecast changes in stream flow and sediment supply. The findings will be used to determine the best model for use by decision-makers trying to protect fish stocks. If the pilot study is successful, researchers will develop a generic version of the model that is applicable to a wider range of BC stream types and fish species.

*(Project team: University of British Columbia, Simon Fraser University, Fisheries and Oceans Canada, BC Ministry of Forests, Lands and Natural Resource Operations)*

**The Alouette River basin – the developing urban fringe at the interface with protected landscapes in coastal British Columbia and consequences for ecosystem resilience**

As temperatures warm, summer precipitation declines, and human demands for water increase, periods of water shortage are likely. This project will use long-term flow data from an urban and agricultural watershed to examine how changes in hydrology might affect water supplies to freshwater ecosystems downstream, and how different uses of water by humans (e.g. wells, diversions, legal and illegal withdrawals) might impact the fish and other species living in and alongside water.

*(Project team: University of British Columbia, Simon Fraser University)*

**Combining historical datasets, ecological modeling and sampling, and cutting-edge visualization techniques for adaptive management of biodiversity in mountain environments**

The most detailed scientific models of British Columbia's future under climate change show that as much as 97% of the alpine habitat in the province may be lost by 2085. This research seeks to understand the factors that maintain biodiversity in alpine meadows, and provide solutions for managing and protecting the species that live there. This project will combine historical datasets, ecological modeling and sampling, and cutting-edge visualization techniques for adaptive management of biodiversity in mountain environments. *(Project team: University of Victoria, Alberta Innovates, BC Parks, Alberta Parks)*

**Evaluating the resilience of northern interior cedar-hemlock forests to western hemlock looper outbreaks**

Forest companies are looking eastward for timber in the "wet-belt forests" dominated by western redcedar and western hemlock. These "ancient forests" suffered insect outbreak from hemlock looper in the 1990s. This project will revisit old sample sites to re-assess tree health, forest regeneration and vegetation. Results will help land managers identify the conditions under which old-growth forest has recovered from defoliation, where it has regenerated, and where forest recovery is hindered by dense shrub growth and might benefit from rehabilitation activities.

*(Project team: University of Northern British Columbia, Canadian Forest Service, BC Ministry of Forests, Lands and Natural Resource Operations)*

**Climate and the decline of yellow-cedar along the north coast of British Columbia**

This laboratory team is using tree-ring analysis to determine whether diminishing snowpacks and late-winter freeze events are driving the decline of yellow-cedar. Estimated at 250,000 hectares, this widespread mortality along the

Pacific Northwest coast is one of the most severe forest declines in the world. Yellow-cedar is the most economically-valuable wood in the region and an integral part of the rainforest, so understanding its vulnerability to changes in climate is essential to guide resource planning and conservation efforts in British Columbia.

*(Project team: University of British Columbia, University of Guelph, BC Ministry of Forests, Lands and Natural Resource Operations, US Forest Service)*

**Climate and ecosystem dynamics on southern Vancouver Island and the Gulf Islands: A historical perspective on strategies for restoration, management, and population recovery**

Garry oak is BC's only native oak. Three major factors causing its decline are fire suppression, deer browsing, and climate change, along with related stressors such as invasive species. This project involves "on-the-ground" research using prescribed fire and deer exclosures, as well monitoring ecosystem change due to climate change.

Understanding how these factors interact will help restore and maintain Garry oak ecosystems.

*(Project team: University of Victoria, Simon Fraser University, University of British Columbia, University of Guelph, University of Sherbrooke, Parks Canada)*

**Place-based policy-making and community resilience-building for climate change**

Achieving integrated social, economic and environmental development and sustainability is one of the greatest challenges governments around the world face today. Given the complexity of the factors involved, an exclusively top-down approach to decision-making will not always yield the best solutions, especially on the climate-change front. This collaborative project will examine the capacity of local governments and communities to participate in multi-level government climate change decision-making and to implement high-quality evidence-based or place-based, policy initiatives.

*(Project team: Simon Fraser University, University of Saskatchewan, Carleton University, Natural Resources Canada)*

**Operationalizing resilience over the long-term: learning from ecosystem baselines**

Researchers will use historic (1930s) air photos which depict forest status in Clayoquot Sound prior to recent harvest. Mapping will specifically emphasize the services derived from large western redcedar, due to its importance for First Nations. This research will help determine the original distribution of this declining resource (large cedar) across the historic landscape, as well as track changes in environmental services such as timber supply, wildlife habitat and wood for cultural purposes. Knowing the baseline structure of historic forests, and the interplaying factors that affect them, will help ecologists make sound restoration decisions.

*(Project team: University of British Columbia, University of Toronto, BC Ministry of Forests, Lands and Natural Resource Operations)*