Pacific Institute
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MEDIA RELEASE
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BC climate researchers tackle LNG, energy efficiency, transport and more

Five issues of critical importance to British Columbia—transportation, electrical grid integration, energy efficient buildings, forestry, and natural gas development—form the basis for five major projects from the Pacific Institute for Climate Solutions (PICS) that will all be underway by May 1, 2015.

The institute has committed $7.5 million to the projects (approximately $1.5 million each), subject to meeting interim progress targets over a five-year duration, with varying start dates in 2014 and 2015. The full titles of the projects are:

- The 2060 Project: Integrated Energy System Pathways for British Columbia and Canada
- The Scale of Natural Gas Development and Maximizing Net Social Benefits
- Transportation Futures for BC
- Energy Efficiency in the Built Environment
- The Forest Carbon Management Project

Each project will bring together experts from a wide range of disciplines including engineers, climate scientists, hydrologists, planners, social scientists, economists and representatives from First Nations. Team members represent a range of institutions including local, provincial and federal government, industry, the business community, and academia from across the four PICS universities (the University of Victoria, University of British Columbia, Simon Fraser University and the University of Northern British Columbia).

PICS executive director Tom Pedersen says climate change is the greatest challenge facing humanity, and its impacts are being felt locally, for example, through rising sea levels, ocean acidification and the pine-beetle infestation. He says if BC is to continue meeting its legislated greenhouse gas (GHG) emissions reduction targets, greater efficiencies are needed across a range of services and sectors vital to the functioning of the economy and well being of its residents.

“Through new research and analysis these teams will identify viable pathways for achieving BC’s transformation to a vibrant low-carbon economy, incorporating the latest technological advances and considering the big picture impact of reform and how to best ensure societal support for change,” he says.

Anticipated outcomes of the five projects include policy briefs for government, PICS white papers containing actionable policy/practitioner recommendations, specialist reports, academic papers, community and industry guides, media releases and conference presentations. Results will be released periodically and be available on the PICS website.

See below for more detailed project descriptions. For more information or to interview project leaders, please contact PICS communications.

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PICS Five Major Projects

Transportation Futures for British Columbia

Transportation needs in BC collectively yield the largest aggregate source of GHG emissions. This project aims to tackle that problem directly by identifying viable pathways for developing low-or-zero emission pathways for sustainable air, land and domestic marine transportation. A key focus will be identifying the expansion potential for high-tech renewable energy use and generation within the transport sector, including electric trolleys, fleets, buses, rail, personal electric vehicles, hybrids and bikes and the optimal topologies for recharging and refueling networks. Other foci, to be explored across multimodal transportation systems, include the potential for increased adoption of hydrogen and associated fuel cell technology and the distribution potential of alternative fuels including compressed (CNG), liquefied (LNG) and renewable (RNG) natural gas. The research team will incorporate land use planning and urban design into the exploration of these modes and their potential deployment. The modeling and analysis effort will take a systems approach to reduce transport GHG emissions while simultaneously assessing social readiness and market support for changes to our transportation systems.

Project lead: Dr. Walter Mérida, Director, Clean Energy Research Centre, UBC

Energy Efficiency in the Built Environment

This project will develop practical strategies and policy recommendations to increase energy efficiency in BC's built environment, which currently accounts for about 10 percent of provincial GHG emissions. The built environment is a complex intertwined multi-scale system of cities, towns and neighbourhoods whose energy performance is shaped by factors such as building design and the behaviour of its inhabitants, as well by the infrastructure that serves those buildings. Therefore the types and location of buildings and how they are designed, built and operated will be central to reducing emissions.

The project team will evaluate many facets toward achieving significantly improved building energy performance and, where possible, net-positive energy buildings. Potential contributions from evolving green building codes, standards, design and new innovations will be explored. The roles of district energy systems and bioenergy sources will be reviewed, as will best practices for increasing building inhabitants' support for, and engagement with, energy efficiency measures. Financing options for energy efficiency retrofits for existing buildings will also be analyzed along with tax and utility-based energy-efficiency incentives, following a rigorous review of international best practices. A key outcome will be to generate practical solutions that can be implemented on the ground by building industry professionals and stakeholders.

Project lead: Dr. Ray Cole, Academic Director, UBC Centre for Interactive Research on Sustainability (CIRS)

The Scale of Natural Gas Development and Maximizing Net Social Benefits

BC has an abundance of shale gas reserves currently earmarked for the development of a new liquefied natural gas (LNG) export market, yet there are many questions about how the scale and nature of development affects resource rents, GHG emissions, water supply and quality, and communities. This project aims to plug that information gap in four targeted areas: a) the economic analysis of markets for natural gas and returns to the province and British Columbians; b) investigating the types of energy sources planned to be exploited during LNG production and the realistic cost implications to industry of using renewable energy sources rather than burning gas (and therefore emitting GHGs); c) studying the cumulative impacts of natural resource development on northern communities; and d) analyzing emerging concerns over hydrological impacts, including the availability of groundwater under a changing climate, and water quality impacts from fracking.

Given the potential contribution of LNG exports to the BC economy and also its potential use as a "bridge fuel" to a low carbon future, this project asks a critical question: Can BC's natural gas reserves be developed in a way that maximizes net social benefits to British Columbians while also decreasing net global GHG emissions?

Project lead: Dr. Nancy Olewiler, Professor of Public Policy, SFU

The 2060 Project: Integrated Energy System Pathways for BC and Canada

The 2060 Project explores the costs and benefits of a range of electrical grid integration options for Canada, initially between British Columbia and Alberta (AB), but eventually nation-wide and into western North America. Grid integration has been hailed as an effective means to reduce greenhouse gas emissions if one region with abundant "clean" renewable electricity supply (e.g. hydro) can displace a heavy emitter (such as coal-fired electricity) in a neighbouring jurisdiction.

Researchers will look at how expanded BC-AB grid interconnections would influence costs, reliability and emissions, taking into account expected changes to hydrology and dam water supplies 50 years from now due to climate change. Further work will investigate the impact of large-scale energy systems across Canada under various carbon policies and global growth scenarios, as well as greater integration into the Western Interconnect. Integration also has the potential to expand consumer access to renewable energy sources such as wind, solar and biomass.

Project lead: Dr. Andrew Rowe, UVic, Associate Professor, Mechanical Engineering

The Forest Carbon Management Project

Given that forestry is an important employer in BC, there is more than the environment on the line as forests are impacted by a changing climate. In addition to exploring how BC's 55 million hectares of forests can best endure as climate conditions change, the project will focus on defining approaches that can contribute to slowing the rate of global warming by removing heat-trapping carbon dioxide from the atmosphere and storing that carbon in living forests or forestry products.

The project team will investigate how forest management strategies can be structured and regionally customized to maximize the forestry sector's "carbon sink" and climate change adaptation potential. It will test how various approaches to harvesting, silviculture, site preparation and stand reestablishment activities can alter GHG balances. For example, reducing delays in forest regeneration, not burning harvest slash and modifying harvesting and wood processing can all lower emissions. Researchers will also identify opportunities to substitute timber products for carbon-intensive steel, concrete or plastics used in many sectors, including the building industry.

Project lead: Dr. Werner Kurz, Senior Research Scientist, Natural Resources Canada