

Catalyst for Sustainable Growth

How BC Bioenergy Network is Building BC's **New Bio-Economy**

Overview 2008–2013





BC Bioenergy Network funded projects are creating new opportunities and economic activity.*

\$16.6 million of BCBN project funding has leveraged new investments for a total project value of \$123.5 million, which represents 1,826-person years of employment, \$106 million in GDP and \$19.75 million in new tax revenues for government.

BCBN is also helping to:

- reduce GHG and CO₂ emissions when bioenergy is used as replacement for fossil fuels
- improve air quality by reducing sulfur dioxide and nitrogen oxides emissions
- reduce and utilize wastes that are otherwise burnt or sent to landfill
- reduce the risks and costs associated with forest fires

* Independent economic analysis undertaken by MMK Consulting indicates that the BC Bioenergy Network has made a positive contribution to British Columbia's economy since its creation in 2008.



MESSAGE FROM CHAIR AND EXECUTIVE DIRECTOR:

Catalyst for Sustainable Growth

BC Bioenergy Network is building British Columbia's new bio-economy by championing bioenergy development and creating greater value from our forests and other biomass resources for the benefit of all British Columbians.

Through our work, we are ensuring that British Columbia has a world-class bioenergy capability by advancing research, deploying near-term bioenergy technologies, and supporting bioenergy development.

BC Bioenergy Network has helped many projects to develop from the proposal stage to the successful deployment of their technology, and on to commercial application in the marketplace. The scientific, intellectual and commercial gains from these project investments are real, practical, and scalable.

However, realizing the full promise of the province's biomass resources will require continued investment, coordination, and collaboration among the participants of this growing network: our universities, training institutes, trades, entrepreneurs and investors, foresters, farmers and governments.

We are now in a critical stage of leveraging our early successes to foster the ongoing growth of the sector and ensure they are replicated elsewhere.

To this end, BC Bioenergy Network is facilitating bioenergy development and supporting a new generation of British Columbians—young engineers, scientists, biochemists and technicians—to find new ways to create greater value from BC's forests and biomass resources.

It is clear that bioenergy is much more than an alternative source of energy. It is a broad-based solution for reducing waste, fostering skills training and creating jobs, while meeting climate change goals and unlocking the full value of our forest and biomass resources.

Bioenergy is a key to future sustainable growth, and it is imperative that its full potential be realized.



John Allan
Chair



Michael Weedon
Executive Director

John Allan
Chair

Michael Weedon
Executive Director

BIOENERGY:

The future is closer than you think

Bioenergy starts when materials traditionally considered to be waste are transformed into ultra-clean energy, power and other high-value products that can be used here or sold abroad.

Bioenergy is creating a new and growing cluster of talented companies, employing skilled workers in high-paying jobs.

It is an innovative component of the economy enabling British Columbians to apply their skills and training in a growing sector with significant potential. All while minimizing environmental impacts through the reduction of waste and greenhouse gas emissions.

The Benefits of Bioenergy

Biomass is a growing sector of British Columbia's economy, creating new jobs, trade and investment opportunities by maximizing our resources, while also improving air quality and reducing waste and greenhouse gas emissions.

Economic and employment diversification — Using local biomass resources diversifies the economy, creates green jobs and keeps energy dollars in the community. This is especially important for First Nations, rural and remote communities, where expensive and environmentally less attractive propane and diesel are relied on for heat and power.

New trade and investment opportunities — Investments in and development of bioenergy results in new products and technologies for both domestic and export markets.

Greenhouse gas and methane gas reductions — Bioenergy significantly reduces greenhouse gas emissions by replacing fossil fuels, up to 42 times for coal replacement and 30 and 20 times for oil and natural gas respectively. Anaerobic digestion and gasification solutions also provide a means to reduce methane gas emissions from agriculture operations and landfills.

Improved air quality — Bioenergy initiatives can dramatically reduce air pollution and improve air quality when bioenergy applications with enhanced air emission control equipment is used, when biomass based transportation fuels replace fossil fuels, or when replacing coal.

Waste reduction and municipal benefits — Waste reduction is a particularly important benefit of bioenergy given that much of what we consider polluting waste is in fact bio-feedstock containing valuable carbon content that can be used to produce energy

Forest fire risk mitigation — Another significant environmental benefit related to the improved utilization of forest-based woody biomass residuals is reduced risks and costs of forest fires.

Enhanced resource values — Putting unused and undervalued bio-resources to work adds more value to the entire supply chain. British Columbia's forest products industry has been a leader in early adoption of bioenergy to utilize waste residuals, reduce costs, and create new revenue streams through cogeneration sales.

“BC has an incredible opportunity in bioenergy and UNBC applauds the work of groups such as BCBN that are bringing both attention and innovation to this industry. It is through working together that we will bring new capacity and new technologies to companies and communities throughout British Columbia.”

George Iwama, President, University of Northern British Columbia

Bioenergy allows British Columbians to use new and existing technology to reduce wood waste, while getting more value from our forest resources, which creates new jobs and investment opportunities.

“Operating traditional businesses in two of the most forest dependent communities in BC, BCBN has provided us a roadmap of opportunities to explore how we could add new revenue streams to our company and build a brighter future for our hard working employees and other stakeholders.”

Ken Shields, Chairman, CEO, and President, Conifex Timber Inc.

“BCIT has received much more than support for funding from BCBN. They are the leading source of knowledge around bioenergy applications and have connected us to many key resources that are helping us establish BCIT as a leader in utilization of renewable energy.”

Lorcan O'Melinn, Vice President Finance and Administration, British Columbia Institute of Technology



Bioenergy in action

BCBN has provided funding of \$15.75 million to 19 bioenergy capital projects, \$822,285 for 11 capacity building initiatives, and \$245,000 in contributions for education and advocacy.

BCBN funded projects create new opportunities and economic activity. \$16.6 million of BCBN project funding has leveraged new investments for a total project value of \$123.5 million.

Projects cover the spectrum of waste streams, including forest biomass residues, agriculture residuals, and municipal waste. Deployment of these capacity building and early stage commercial projects decreases risk and facilitates growth to full scale commercialization. To date, 99 percent of these projects are underway or deployed.



BCBN: Leadership and Innovation

BC Bioenergy Network was provided a \$25-million grant from the BC Ministries of Energy and Mines and Environment in 2008 to foster the development and accelerate the growth of BC's bioenergy sector. A not-for-profit agency, BCBN is committed to working with and championing the sector to ensure its full potential is realized.

However, to make that goal a reality BC Bioenergy Network will continue to work in partnership with its private sector partners and the provincial government. In British Columbia, as elsewhere around the globe, building a successful large-scale bio-economy is dependent on consistent and predictable government support.

In fact, realizing the full promise of bioenergy will require continued investment, coordination, and collaboration by all stakeholders. We are prepared to do our part as an industry champion, by serving the industry, supporting success and maintaining efficient and effective service to the bioenergy industry.

We are looking forward to working with the provincial government to recapitalize BC Bioenergy Network so that the full benefits of the BC bioenergy sector are realized for the good of the economy and the environment.

How we work

1. Investing in pilot and full-scale capital demonstration projects by providing grants, loans and equity investments.
2. Supporting capacity-building projects from evaluations to planning and technical feasibility studies.
3. Education and advocacy by sponsoring events and workshops in BC and helping attract major world class events to the province.

To generate more value from our forest and biomass resources, BC Bioenergy Network is:

- **Maximizing** the value derived from BC's forestry and biomass resources;
- **Developing** mission-driven research, development and demonstration projects;
- **Supporting** projects that reduce greenhouse gas emissions;
- **Networking and partnering** in BC, Canada, and internationally to advance the bio-economy; and
- **Leveraging** funding to support bioenergy technology and applications.

Industry Facts

- BC produces 52 percent of all wood pellets made in Canada.
- BC supplies 15 percent of the global market for wood pellets.
- BC produces 56 percent of all biomass generated electricity and 58 percent of all biomass thermal capacity produced by means of cogeneration and independent power production in Canada.
- BC accounts for nearly 25 percent of all employment related to the growing Canadian biomass heat market.

Natural Resources Canada estimates the annual global growth of bio-products to be in the range of 5–24 percent depending on product type and the total markets to grow to almost \$100 billion by 2015.

“The Northern and Central Interior of BC is taking a progressive approach to extracting value from our fibre basket which includes the effective utilization of woody biomass residuals. This has resulted in a growing wood biomass sector that is contributing to the province's economic prosperity, and local and international environmental improvement. BCBN has been a strong supporter of efforts to develop our region as a cluster for bioenergy activity.”

Greg Stewart, President, Sinclair Group Forest Products Ltd.

From Ideas to Action



Kwadacha First Nation

Following a review of the state of off-grid power production in British Columbia and thanks to the work of the BC First Nations Energy and Mining Council, BC Bioenergy Network was introduced to the Kwadacha First Nation community in Northern BC. In 2011, the 300 residents of Kwadacha required 953,000 litres of diesel for power and electrical baseboard heating and 170,000 litres of propane for heating central buildings such as the school and store. The cost of providing diesel based power to this remote community was determined to be at least 67 cents per kWh. A properly designed biomass CHP system with satisfactory energy loads for both electricity and heating holds the potential to reduce this cost in half, resulting in savings to the community, rate payers, and tax payers. The planning and engineering work is currently underway and pending additional funding confirmation, implementation of the system should commence in 2013.

“Complex issues such as finding alternatives to the use of propane and diesel for heat and power in BC’s remote and First Nation communities require a significant team of experts. BCBN is making it happen.” **Dave Porter, CEO, BC First Nations Energy and Mining Council**



Columbia Shuswap Regional District and FortisBC

The Columbia Shuswap Regional District has partnered with FortisBC at the Salmon Arm landfill to build and commission the first municipal landfill gas facility to capture landfill gas and upgrade it to pipeline-grade renewable natural gas — a direct replacement for fossil natural gas. BC Bioenergy Network provided \$200,000 support to FortisBC on the gas clean-up portion of a \$2 million project. The regional district estimates that the CO₂e emission reductions generated from the methane recovery will be 10,000 tonnes annually over the next 15 years of the project life. Environmental benefits will be further enhanced at an estimated average of 27,000 gigajoules per year of renewable natural gas directly replacing natural gas combustion in homes and businesses in the area.

“BCBN has been a key player in assisting FortisBC and our partners advance new initiatives in British Columbia. We view the participation of BC Bioenergy Network as a critical component in continuing to move new initiatives forward in BC through their involvement in early stage feasibility funding that helps reduce the risk for all proponents in these projects.”

Doug Stout, Vice President, Energy Solutions and External Relations, FortisBC

Research and Development

British Columbia is blessed with world class research talent through its four major universities, University of British Columbia (UBC), University of Victoria, Simon Fraser University, and University of Northern British Columbia. BCBN provided a grant to the Clean Energy Research Centre at UBC to refurbish and re-commission its gasifier equipment which is now used for a variety of university and company biomass feedstock research activities. BCBN continues to work closely with UBC and was instrumental in facilitating a partnership between the university and the Korean Institute of Science and Technology that will boost joint research and development in biomass based fuels and chemicals.

On the technical and trades front, BCBN is working with the British Columbia Institute of Technology, to develop a project that will use wood waste from their wood working programs to fuel an on-campus biomass energy system that will provide heat to campus buildings while offering valuable information on fuel supply options and ultra clean emission levels.

“BCBN’s partnership with the university continues to assist us in achieving our academic and operational goals. Specifically their financial contribution to UBC’s Bioenergy Research and Demonstration Facility played a pivotal role in the development of the technology and the facility’s establishment. BCBN has also acted as a catalyst in making local, national and international connections for our researchers. Connections that will generate significant benefits, through increased knowledge, technology development, and global deployment of solutions.”

John Hepburn, Vice President Research and International, University of British Columbia

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