




# Canadian Innovation in Bio-energy

The newly formed Bio-Pathways Partnership Network, facilitated by FPAC and led by industry, provides a forum for member companies to meet, partner on initiatives of common benefit, and exchange knowledge and contacts.

To learn more visit:

[fpac.ca/bio-pathways-partnership](http://fpac.ca/bio-pathways-partnership)

 @BioPathPartner

 Bio-pathways Partnership Network



Forest Products Association of Canada  
[fpac.ca](http://fpac.ca)

 @FPAC\_APFC

 Forest Products Association of Canada

Canada's forest products industry has a long history of using mill and forest residues. First used to heat facilities, residues such as bark, sawdust, wood chips, branches, and tree tops are now becoming feedstocks for sophisticated steam and electricity cogeneration facilities, lumber drying kilns, and new bio-energy products such as wood pellets, syngas, cellulosic ethanol, bio-diesel, and bio-oil.

## INDUSTRY TRANSFORMATION LEADS TO A WEALTH OF OPPORTUNITY

Forest biomass already supplies more than 60 percent of the fuel used to generate heat and electricity in some Canadian pulp and paper mills. This figure will no doubt sharply increase as governments, institutions, and industry recognize the need to replace fossil fuels with more efficient and renewable energy sources.

Many kraft pulp mills are already installing condensing turbines to generate more electricity from cogeneration from black liquor, sludge, and harvest residue combustion. According to the Future Bio-Pathways Report (released in February 2011), this is a good first step toward integrating traditional mill operations with bio-energy production. The report concluded that producing more heat and power—and transportation fuels—is economically viable in bio-refineries where other high-value byproducts are made.

## GREAT MARKET POTENTIAL

After hydro-electricity, biomass is the second most important renewable energy source in Canada, of which industrial wood waste accounts for the largest share. With large reserves of agricultural and forestry resources, Canada has more biomass resource than any other nation.

Bio-energy also represents about five percent of Canada's total primary energy resources. Every year, more than 138 million megawatt-hours of bio-energy are used in the industrial sector.<sup>1</sup> Bio-energy also creates more permanent employment than other energy sources (e.g., from the same capital investment, bioenergy creates twice as many jobs as other types of renewable energy and three times as many jobs as fossil fuels).

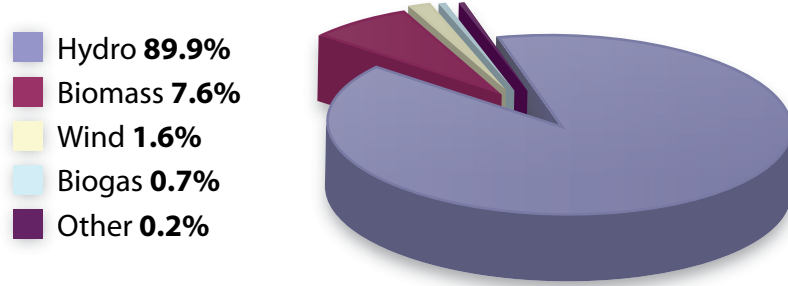
## SUPPORT FOR INDUSTRY INNOVATION

There are a number of federal and provincial funding programs to help support growth in Canada's bio-energy sector, including the EcoEnergy for Biofuels Program, Pulp and Paper Green Transformation Program (PPGTP), Sustainable Development Technology Canada's NextGen Biofuels Funds, and B.C.'s Northern Rural and Remote Communities Green Heat Initiative.

The Canadian Bioenergy Association and the Wood Pellet Association of Canada are

<sup>1</sup> NRCan's renewable energy site ([www.nrcan.gc.ca/eneene/renren/aboapren-eng.php](http://www.nrcan.gc.ca/eneene/renren/aboapren-eng.php))

Biomass versus other Renewable Energy Sources from the Canada Report on Bioenergy 2010 - Canadian Bioenergy Association:



working together to create Go Pellets, a program that promotes a domestic wood pellet market.

Canada also has many public and academic institutions that are producing cutting-edge science and technology in the bio-energy domain (e.g., the Canmet-ENERGY Technology Centre, the National Research Council’s Institute for Chemical Process and Environmental Technology, the Centre of Excellence for Energy, the Biofuels Test Centre in Saskatchewan, and the Waterloo Institute for Sustainable Energy). Networks like the Natural Sciences and Engineering Research Council’s Bioconversion Network and the Canadian Biomass Innovation Network provide important links between federal researchers, industry, academia, non-governmental organizations, policy makers, and the international bio-energy community.

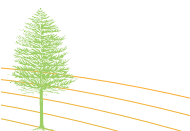
**DEMONSTRATED SUCCESSES: FROM CONCEPT TO COMMERCIALIZATION**

Canada has several large-scale bio-energy facilities and has modified several existing mills with biomass combustion systems that efficiently burn virtually any solid biomass fuel. Examples of successful bioenergy innovations include:

- » The manufacture and export of wood pellets in Canada has grown exponentially

in the past several years. Today, there are more than 30 pellet plants in operation, as well as several large recently funded pellet projects, including a new pellet plant in Houston, B.C. and a pellet plant expansion in Prince George. Research into advanced processes for pelletizing (e.g., torrefaction) are being funded and demonstrated under Natural Resources Canada’s TT-PSD (Technologies Transformation Pilot Scale Demonstration) program.

- » Canada is a leader in pyrolysis oil technology and development. Ensyn, for example, is building the world’s largest “fast” pyrolysis plant at the Tolko sawmill in High Level, Alberta. This plant will be capable of processing 400 bone dry tonnes of biomass per day into 85,000,000 litres (22.5 Mgy) of pyrolysis oil annually.
- » Elementa Group’s Pre-Commercial Demonstration Plant in Sault Ste. Marie, Ontario, recently received funding from the Centre for Research and Innovation in the Bio-Economy (CRIBE). The funding is meant to expand its current process of using municipal solid waste to produce a high quality synthetic gas (syngas) to include forest waste material, such as treetops, branches, and foliage, as an additional feedstock.



## PLATFORM FOR MUTUALLY BENEFICIAL PARTNERSHIPS

Revolutionizing Canada's forest products industry requires integration of traditional and novel processes, products, and partnerships. Collaboration across sectors is not only economically beneficial (joint ventures with pulp and paper mills present excellent opportunities for partners as the steam can be used in the manufacturing process) but is also environmentally sound with a low carbon footprint, making these technologies extremely attractive in the global marketplace, particularly in Europe.

With access to world-class R&D, global partnerships, and guaranteed returns on investment, the time is right to support and partner with Canada's forest products sector.

With an abundance of renewable biomass across the country, and an ever-growing number of companies taking advantage of new generating technologies, Canada's forest products industry is poised for tremendous growth and prosperity in the new bio-economy.

## CANADA'S ENVIRONMENTAL ADVANTAGE

Canada is seen as the world's most environmentally advanced supplier of forest products because it is committed to sustainable forest management and abides by forestry regulations and laws that are among the most

Bio-energy is the use of renewable biomass-based resources to produce:

- electricity for power grids;
- heat or electricity for industrial, commercial, institutional, agricultural, and residential uses;
- liquid fuels for use in transportation; and
- gaseous fuel, such as bio-gas and syngas, which can in turn be used to generate heat and power.

stringent in the world. Members of the Forest Products Association of Canada (FPAC) adhere to strict environmental principles: harvest legally, regenerate harvested lands promptly, reduce waste, promote paper recovery and recycling, reduce greenhouse gases, and remain open to public scrutiny. All FPAC members are third-party certified under one, or more, internationally recognized standard for good forest management – Canadian Standards Association (CSA), the Forest Stewardship Council (FSC), Programme for the Endorsement of Forest Certification Standards (PEFC), and/or the Sustainable Forestry Initiative (SFI).

