

Sustainable Biomass— An Emerging Ontario Opportunity for Carbon Reduction, Jobs And Innovation



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Ontario's recent biomass investments in the Thunder Bay area recognize the significant economic and environmental benefits this energy source delivers and better positions our province to compete in the rapidly emerging global bio-economy.

The European Union (EU) developed its first biomass strategy in 2005 citing improved energy security, job creation, innovation and lower greenhouse gas emissions (GHG) as the benefits. The EU defines biomass as “the biodegradable fraction of products, waste and residues from biological origin from agriculture (including vegetal and animal substances), forestry and related industries including fisheries and aquaculture, as well as the biodegradable fraction of industrial and municipal waste”. Based on current EU assessments, biomass could account for two-thirds of their renewable energy target by 2020.

Denmark made an earlier start, building the world's first biomass-fuelled heat and power plant in 1989. About 70 percent of Denmark's renewable energy comes from dual fuel (coal or gas with biomass) or 100 percent biomass generating stations. Some of this biomass fuel is imported from Canada.

Today, Denmark has three bio-refinery projects underway producing high-value chemicals, materials to replace those based on petroleum, and transportation fuels. The Maabjerg BioEnergy Complex, expected to be operational in 2017, integrates an existing combined heat and power plant, a new biogas plant using manure and industrial waste, and a planned bio-ethanol plant.

Studies supported by federal and provincial ministries, the academic community and Ontario Power Generation (OPG) confirm that Ontario's agricultural and forestry wastes and purpose grown crops represent a substantial sustainable and renewable, carbon-neutral energy resource. They also corroborate that investments in a provincial biomass supply chain and related research and development underpin the creation of thousands of good jobs, world-leading innovation and economic growth. Ontario has begun to develop this exciting new opportunity.

The conversion of OPG's Atikokan Generating Station (GS), now North America's largest 100 percent biomass-fuelled power plant, provides low-carbon, dispatchable, peak capacity electricity. According to OPG, wood-based biomass compared to coal generation contains 75 percent less nitrogen oxide and virtually

no sulphur dioxide—both smog-causing pollutants. It also produces 80 percent less GHG emissions compared to combined cycle natural gas plants.

Besides being a lower cost option than building new generation, the Atikokan conversion recycles a provincially-owned asset, secures threatened existing jobs and continues support for local communities. One hundred percent of the biomass fuel for Atikokan is sourced within Ontario. This creates new jobs in forestry and transportation and First Nations and Métis communities.

Similar benefits have been realized from the conversion of the Thunder Bay Generating Station in 2015 to use advanced biomass. This is the first of its kind in the world. Advanced biomass, with its favourable handling and storage properties, makes it a leading candidate for coal plant fuel conversions. This helps place Ontario at the forefront of this technology.

In support of these conversions, Ontario has helped finance leading edge biomass research and development. Thunder Bay now hosts a

“biomass R&D cluster” that collaborates with similar partnerships in Eastern and Southwestern Ontario. In 2006, Ontario's Ministry of Energy tasked the Ontario Centres for Excellence with a \$4 million bio-energy research program related to the conversion of the Atikokan Station. Between 2007 and 2009, Ontario also helped establish a biomass focused R&D project at Lakehead University and the non-profit CRIBE—the Centre for Research and Innovation in the Bio-Economy. In 2014, the OPG Bioenergy Learning and Research Centre officially opened at Confederation College.

Converting Ontario's now idle Nanticoke and Lambton coal GSs to use biomass and natural gas represent more valuable opportunities that could further stimulate Ontario's growing bio-economy.

The Power Workers' Union, like the academic community and stakeholders from Ontario's agriculture, forestry and power sectors applauds these advances in Ontario's emerging bio-economy. To be a global leader, Ontario will now need to take the next steps.

Biomass Investments: Good for the Northwest and All of Ontario

Ontario's forestry sector contributes 170,000 jobs and more than \$11 billion annually to the provincial economy.

Converting Ontario Power Generation's Atikokan and Thunder Bay Generating Stations from coal to renewable, carbon-neutral biomass, delivers significant benefits to northern communities, First Nations and the Métis.

- Reliable electricity to meet peak demands and to back-up intermittent wind and solar generation
- Lower Greenhouse Gas Emissions
- Good paying jobs in electricity generation and new biomass fuel supply chain enterprises

Thunder Bay and the surrounding area also profit from Ontario's investments in biomass research and development such as:

- CRIBE: Centre for Research & Innovation in the Bio-economy
- OPG Bioenergy Learning Research Centre at Confederation College, and the
- Lakehead University Biorefining Research Institute

Ontario's forestry and clean energy sectors can compete with other jurisdictions that have been advancing biomass for over a decade.

Investing in biomass and our provincially owned assets keeps the benefits here.

For more information please go to: www.pwu.ca

FROM THE MEN AND WOMEN WHO HELP KEEP THE LIGHTS ON.

