Accelerating the Forestry Sector's Environmental Performance

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Forests and Climate Change

Climate change is a long-term shift in climate measured by indicators such as temperature, precipitation and winds, and involving shifts in both average conditions and extreme conditions. It is one of the most important environmental issues of our time, and requires urgent action.

The primary cause for concern now and into the immediate future is the build-up of greenhouse gases, particularly atmospheric carbon dioxide. Healthy growing forests address climate change by absorbing carbon dioxide and storing carbon – and solid wood and some paper products continue to store carbon for decades, or longer.

The Intergovernmental Panel on Climate Change says sustainable forest management and avoiding deforestation may significantly contribute to avoided emissions while providing other benefits such as conserving water resources, preserving biodiversity, supplying valuable products and supporting livelihoods for communities around the world.

Canada's Forests and Climate Change

Canada has close to 400 million hectares of forestland – representing 10 per cent of the world's forest cover and 30 per cent of the world's boreal forest. It produces quality forest products in a way that meets the highest environmental standards, and is uniquely positioned to meet the world's demand for wood and paper products from sustainably managed forests.

Canadians understand that they have a duty to be conscientious stewards because their forests meet their many environmental, social and economic needs, as well as those of the world community.

Canada's forest products industry is globally recognized for its environmental leadership, including reduced greenhouse gas emissions and the use of clean energy to meet its energy needs. It has pledged to become carbon neutral through the lifecycle of products by 2015, without purchasing carbon offset credits.

It is one thing to aspire to be carbon neutral and set ambitious goals to reduce greenhouse gas emissions. Canada's forest products sector is the first in the world to undertake industry-wide climate change mitigation measures.

The Many Values of Canada's Forests

As well as absorbing and storing carbon, Canada's natural forests support an immense array of values. They are home to about two-thirds of the country's estimated 140,000 species of plants, animals and micro-organisms – including some threatened species. They enhance the natural landscape, providing recreational space for leisure activities.

Canada's $54-billion-a-year forest products sector accounts for nearly 12 per cent of the country's manufacturing gross domestic product and about 600,000 direct and indirect jobs in hundreds of communities across the country. It provides a broad array of wood and paper products that are an important part of day-to-day lives in Canada and around the world.

In 2003, the pulp and paper sector became the first major Canadian industry to

sign a Memorandum of Understanding with the Canadian government to find ways to reduce the impacts of climate change at mills and through sustainable forest management practices.

In 2007, the Forest Products Association of Canada announced industry-wide carbon neutrality by 2015, without the purchase of carbon offset credits.

In 2010, forest companies and environmental organizations signed the Canadian Boreal Forest Agreement, which includes a goal aimed at reducing greenhouse gas emissions along the full life cycle from forest to end of product life.

Deforestation accounts for about 18 per cent of greenhouse gas emissions worldwide. Canadian law requires prompt reforestation after public lands are harvested, one of the reasons why it has virtually no deforestation even after more than 100 years as one of the world's leading forestry nations.

Illegal logging contributes to deforestation and habitat destruction, and is a serious detriment to forest sustainability. It is not an issue in Canada because of the country's multi-faceted governance structure for sustainable forest management.

Achieving Carbon Neutrality

In 2006, the New Oxford American Dictionary chose carbon neutral as its word of the year, with the following definition:

> "Calculating your total climate-damaging carbon emissions, reducing them where possible, and then balancing your remaining emissions, often by purchasing a carbon offset: paying to plant new trees or investing in 'green' technologies such as solar and wind power."

Achieving carbon neutrality generally involves three steps: measure existing carbon footprint; develop targeted goals to reduce emissions; and buy offsets to achieve a zero net emission. Canada's forest products sector has completed the first step, is working on the second step – and aims to become carbon neutral without buying offsets.

In 2007, the Forest Products Association of Canada commissioned the National Council for Air and Stream Improvement (NCASI) to produce *The Greenhouse Gas and Carbon Profile of the Canadian Forest Products Industry*. As a result of this groundbreaking research report, Canada's forest industry was the first in the world to assess its total carbon profile through the entire value chain.

Investigators analyzed direct emissions from forest product industry manufacturing facilities, most resulting from fossil fuel combustion. They explored indirect emissions associated with electricity purchases, as well those associated with harvesting and transporting raw materials and products. They looked at carbon sequestration, both in the forest products industry value chain and in carbon stored in forest products.

The Carbon Cycle

The glass panels of a greenhouse let in light and keep heat from escaping, providing warmth for the plants growing inside. A similar process occurs when the sun's energy reaches the Earth – some is absorbed by the Earth's surface, some radiates back into space, and some is trapped in the Earth's atmosphere, keeping the planet warm enough to sustain life.

Carbon is an element and a basic building block of life – the carbon cycle affects the amount of energy trapped in the atmosphere. If too much carbon dioxide is emitted, the atmosphere traps more heat, warming the planet.

Trees absorb carbon dioxide from the air during photosynthesis. They use the carbon to make sugars and starches to feed cell growth, and release the oxygen back into the air. Carbon dioxide is released when the plants or the resulting products decompose or burn. Humans and other animals inhale oxygen and exhale carbon dioxide.

When a tree is harvested, 40 to 60 per cent of the carbon stays in the forest and the rest is removed in the logs, which are converted into forest products. Some carbon is released when the forest soil is disturbed during harvesting, and the roots, branches and leaves left behind release carbon as they decompose.

Once the harvested area is regenerated, either naturally or by planting seedlings, the forest begins to store carbon again. This combination of harvest and regrowth – along with the fact that some forest products continue to store carbon for decades or longer – mean sustainable forest practices can lower greenhouse gas emissions.

The balance of the natural carbon cycle has been upset. Key human causes the consumption of non-renewable fossil fuels, such as oil, natural gas or coal, which increases the amount of carbon dioxide released into the atmosphere, and deforestation in tropical regions, which reduces the amount of carbon dioxide absorbed.

> ***"The battle against climate change cannot be won without the world's forests – this is now clear."***
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> — Ban Ki-moon
> Secretary-General of the United Nations. 2008.

Towards a Carbon Neutral Forest Industry in Canada

By 2015, Canada's forest products sector aims to be carbon neutral without having to buy carbon offset credits. Benefits will be felt across the entire Canadian forest products value chain and into other sectors. Since the impacts of greenhouse gas emissions go beyond Canada's borders, reducing them will yield global benefits.

The Carbon Neutral Pledge was undertaken by the Forest Products Association of Canada (FPAC) with the support of World Wildlife Fund (WWF)-Canada. It is

backed by an external advisory group of experts representing the Canadian Forest Service, FPInnovations (Forintek and Paprican), the National Council for Air and Stream Improvement, the Pembina Institute, the Rockefeller Brothers Fund, the University of Western Ontario Institute for Catastrophic Loss Reduction, and the World Resources Institute.

Through the Carbon Neutral Pledge, FPAC and WWF-Canada are looking for ways to reduce emissions and store more carbon through the entire carbon cycle – from the forest to product manufacturing and end use through to disposal. This includes reducing greenhouse gas emissions by switching to renewable energy sources such as biomass in mills or by improving transportation networks. In the forest, carbon storage may be increased by optimizing rotation ages, or through alternative harvesting and planning techniques that consider carbon along with other values such as biodiversity.

The Carbon Neutral Pledge

The pledge commits FPAC and WWF Canada to using their collective resources and influence to effect positive change, and leverage broader uptake within the forest industry, across the forest product value chain, and in other sectors. Together, they will:

1. Develop an implementation strategy to achieve carbon neutrality, including targets, monitoring, evaluation and periodic public reporting on progress.

2. Develop descriptions of potential measures for greenhouse gas mitigation and explore their applicability.

3. Encourage, support and advance the development and implementation of greenhouse gas mitigation measures within the forest industry and along the Canadian forest products value chain.

4. Ensure the implementation of practices that conserve biodiversity in carting out activities in support of this agreement.

5. Communicate progress achieved and the forest industry's leadership on climate, in a manner that encourages similar commitments and actions in other industries, other sectors and other value chains, in Canada and internationally.

6. Advocate for and advance policy and fiscal measures to encourage broader implementation of measures to mitigate climate change.

The intended impacts are to provide measurable improvements in greenhouse gas performance across the forest industry in Canada; achieve greater accountability for greenhouse gas impacts across the forest products value chain; and increase support for implementation of voluntary sector-wide greenhouse gas commitments in other sectors and/or other countries.

Life Cycle Assessment

Life cycle assessment is increasingly being used as an important and effective tool to support sustainability goals. It considers the economic, environmental and social consequences of a product or process over its entire life, from raw material extraction to manufacturing, packaging, distribution, use and eventual reuse or disposal.

Life cycle assessment is a comprehensive environmental accounting tool with well-established procedures and methods that are governed by specific rules and standards, most notably those developed by the International Organization for Standardization (ISO).

While there has been a growing focus on carbon as an indicator of environmental performance, carbon and greenhouse gases are just one subset of a full life cycle assessment. There are specific carbon methodologies for the forest industry such as the Forest Industry Carbon Assessment Tool, a collaboration of the International Finance Corporation and National Council for Air and Stream Improvement, which addresses the overall life cycle greenhouse gas impact of forest industry manufacturing facilities or companies.

Improving Performance to Deliver Results

In the last 20 years, Canada's forest products sector has improved its environmental performance by upgrading equipment and implementing leading-edge technology.

Since 1990, Canada's pulp and paper sector has achieved dramatic results, including:

- a 93 per cent reduction in harmful toxins and 62 per cent reduction in particulate emissions from mills
- decreases of 75 per cent of total particulate matter and 65 per cent of total reduced sulphur released per tonne of output (between 1999 and 2009)

The sector has virtually eliminated dioxins in effluents, and installed biological effluent treatment systems at mills. It has reduced oxygen-demanding substances and suspended solids by more than 90 per cent and 70 per cent, respectively.

From 1990 to 2009, it reduced emissions from mills by 68 per cent – the equivalent of removing as many as 300,000 cars from the road annually.

Since 1990, Canadian pulp and paper mills have reduced total greenhouse gas emissions by more than 10 times Canada's Kyoto target reduction of six per cent. A tonne of pulp or paper produced in Canada results in 68 per cent fewer greenhouse gas emissions now than in 1990.

Canada's forest sector is converting more harvested fibre into useful products and energy – almost 90 per cent today, up from 61 per cent in 1970. With the right technologies, more and more of this biomass can be converted to other products and clean, renewable energy, which means less winds up in landfills.

Clean, Renewable Energy

Scientists agree that climate change is largely due to emissions of greenhouse gases, especially carbon dioxide from burning fossil fuels. There was a time when residues from harvesting and sawmills were sent to the landfill or burned – adding to these emissions. Today, Canada's forest products industry is using these residues to produce clean renewable energy as a sustainable alternative to traditional energy.

Bioenergy using forest biomass is an environmentally friendly and sustainable alternative to fossil fuel. It has no net greenhouse gas emission because the carbon dioxide produced was only recently removed from the atmosphere and is part of a natural cycle, to be re-absorbed by regeneration of the forest. Except for hydroelectric power, forest biomass is Canada's largest source of electricity from renewable sources – bigger than wind, solar and tidal combined.

Canada's pulp and paper facilities have reduced their reliance on purchased fossil fuels to the point where renewable energy – primarily forest biomass – now constitutes nearly 60 per cent of the total energy used by the forest industry. It has reduced its use of fossil fuels by 45 per cent and improved its greenhouse gas emissions intensity by 61 per cent.

Across Canada, governments and businesses are investigating biomass possibilities such as cellulose-based ethanol, transportation fuels and biochemicals. Fuels made from biomass could potentially replace the carbon-based fuels used in some manufacturing and industrial processes.

Canadian Boreal Forest Agreement

In 2010, 21 forest companies and nine leading environmental organizations signed the Canadian Boreal Forest Agreement which, once fully implemented, will lead to the highest environmental standards of forest management in 72 million hectares (178 million acres) of Canada's public boreal forest.

The agreement aims to conserve significant areas of Canada's boreal region, protect threatened woodland caribou and provide a competitive market edge for participating companies. It also recognizes the role forests, forest protection, forest management and forest products can play in mitigating and adapting to climate change, and commits signatories to take action on climate change, with a full life cycle approach to forest carbon management.

In the early stages of the agreement, the industry and environmental organizations will, among other things, identify areas of climate and energy policy that intersect with forest management and conservation, and create a work plan for developing joint positions.

A Promising Bio-future

Canada is in a unique position to become a leader in the 21st Century bio-economy by combining the environmental leadership of its forest industry with scientific breakthroughs. Canadian researchers are developing technological innovations to use wood fibre – including biomass such as harvesting and sawmill residues – to produce clean, renewable energy and fuel, as well as innovative bio-chemicals and bio-materials.

Through its *Future Bio-pathways Project*, the Forest Products Association of Canada identified the best opportunities for bio-technologies. More than 65 top Canadian experts, in fields as diverse as bio-technology, investment banking and carbon pricing, analyzed dozens of traditional and dozens of emerging bio-industries to assess how forest fibre could be substituted for fossil fuel. The project resulted in a framework for decision-making and interactive tools so companies can identify the best prospects to meet the global demand for clean energy and bio-products.

Canadian researchers are seeking ways to improve the quality and recovered quantity of forest biomass, and finding ways to convert it into energy. For example, gasification (a thermochemical process) is the quickest way to convert biomass into a gaseous fuel to heat homes or power vehicles. Thanks to recent technological innovations, wood fibre/forest residue has the potential to become a major source of clean energy for society at large, and could meet the energy needs of 2.5 million homes, or one out of every five homes across Canada.

Canada's forest industry is integrated for maximum efficiency. Lumber mills produce residues that become a source of fibre for pulp mills and products such as particleboard and medium-density fibreboard. These residues are also used as a source of clean energy in many mills.

Consumers Can Make a Difference

Concern for the state of the world's natural resources and environmental health has never been greater. Consumers want to know that climate change challenges are being addressed, that forests are being regenerated, that wildlife habitats are being protected and that forest biodiversity is respected and maintained.

As emerging economies improve the standard of living and quality of life for people around the world, there will be increased demand for the many products forests can provide, which will exert even greater pressure on global ecosystems.

With responsibility for 10 per cent of the world's total forest cover, Canada manages its diverse lands and produces quality forest products in a way that meets the highest environmental standards.

Choosing wood products from Canada means using an environmentally sustainable product that is better for the environment than steel, plastic or concrete. Choosing pulp and paper from Canada means using products from one of the most environmentally responsible sources in the world. Canada's forest products industry is poised to continue to contribute significantly to the greening of society.

Resources

Canadian Boreal Forest Agreement www.canadianborealforestagreement.com

Canadian Forest Service http://www.cfs.nrcan.gc.ca

Don't Waste Wood http://dontwastewood.com

Forest Products Association of Canada www.fpac.ca

- The Carbon Neutral Initiative
  www.fpac.ca/index.php/en/carbon-neutral-pledge
- The *Future Bio-pathways Project* Study:
  www.fpac.ca/index.php/publications/publication-viewer/392/
- *Life Cycle Assessment and Forest Products: A White Paper*
  http://www.fpac.ca/index.php/publications2/publication-viewer/530/
- *CO2 Neutral Alliance*
  http://www.fpac.ca/index.php/en/carbon-neutral-pledge/

National Council for Air and Stream Improvement www.ncasi.org

PowerUp Canada www.powerupcanada.ca

Tackle Climate Change, Use Wood www.fpac.ca/index.php/en/publications/

Tree Canada www.treecanada.ca

World Wildlife Fund-Canada http://wwf.ca

International Finance Corporation

- Forest Industry Carbon Assessment Tool www.ficatmodel.org

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