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PULP AND PAPER GREEN TRANSFORMATION PROGRAM

Report on Results

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Minister's Message

In 2009, the Government of Canada took decisive action to improve the sustainability of pulp and paper mills by creating the $1-billion Pulp and Paper Green Transformation Program (PPGTP). Now, three years after its launch, the PPGTP has fully achieved its objective. This program has significantly improved the environmental performance of Canada's pulp and paper industry through a record level of investment in green technologies. Pulp and paper facilities have been transformed, opening up access to new revenue streams from their production of renewable energy while reducing costs through energy efficiency improvements.

The 98 projects supported by the PPGTP are having direct, positive environmental, economic and social impacts on recipient mills and the communities they sustain. These include support for 14,000 jobs, improved air quality, lower fossil fuel consumption and reduced greenhouse gas emissions. In some cases, mills have added sufficient renewable electrical capacity to enable them to export green power to the grid, giving Canadians access to this clean and renewable energy source.

The Government of Canada is looking ahead to the next phase of transformation and continues to support innovation and renewal in the forest sector. The Investments in Forest Industry Transformation program and the Transformative Technologies Research Program are supporting the research and commercialization of leading-edge technologies that will enable forest sector facilities to capitalize on new products and processes. More recently, Economic Action Plan 2012 has reaffirmed the Government's commitment to forest industry innovation and market expansion through an investment of $105 million over two years.

The forest industry remains an important contributor to Canada's economy and is playing a key role in its own renewal. The Forest Products Association of Canada recently announced its Vision 2020 Challenge — an ambitious plan for the industry to reach its full potential by focusing on product innovations, further improving its environmental footprint and revitalizing its workforce.

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The Government of Canada supports the industry's strong commitment to accelerating its transformation. We remain committed to working in partnership with industry, the provinces and stakeholders to ensure that our forest sector and rural communities stand at the forefront of new opportunities in tomorrow's sustainable economy.

The Honourable Joe Oliver, P.C., M.P.
Minister of Natural Resources

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Introduction

Over the past several years, a major downturn has significantly challenged Canada's forest sector. This context has inhibited the adoption of environmental technologies by companies and reduced the economic security of forest-dependent communities across Canada.

Recognizing the interplay between competitiveness and the adoption of sustainable practices, the Government of Canada determined that the Canadian pulp and paper industry would benefit from targeted capital investments aimed at improving environmental performance and supporting the ongoing transformation of this sector. On June 17, 2009, the Government announced an unprecedented environmental initiative, the $1 billion Pulp and Paper Green Transformation Program (PPGTP), which was designed to help build a brighter future for Canada's pulp and paper sector.

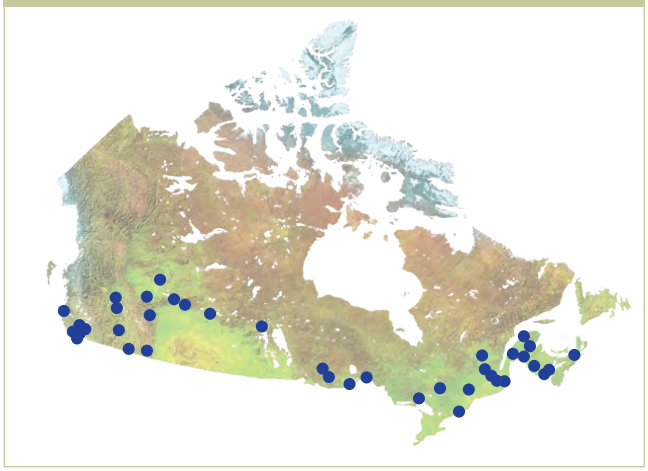
What is black liquor? **Black liquor is a liquid by-product of chemical pulping. It is routinely burned in recovery boilers, both to recover pulping chemicals for further use and to generate renewable heat and power. It is known as black liquor in the kraft pulping process. For the purpose of the PPGTP, black liquor included all liquid by-products of a chemical pulping process that have a positive calorific value and are burned in a recovery boiler to produce energy.**

Background

Under the PPGTP, credits were allocated at a rate of $0.16 per litre (L) of black liquor produced at Canadian pulp mills between January 1 and May 4, 2009, when the program cap of $1 billion was reached. Firms had until March 31, 2012, to draw on their allocated credits to finance approved capital projects that would generate measurable environmental benefits in areas such as energy efficiency and the production of renewable energy. Eligible projects included boiler upgrades, turbine installations and investments in energy-efficient motors and other equipment.

Twenty-four companies were allocated credits under the PPGTP, based on the production of black liquor at 38 pulp and paper mills across Canada. Proponents were permitted to spend the credits earned at one pulp and paper facility on eligible projects at any Canadian pulp and paper mill owned by the same company (Figure 1). This flexibility allowed companies to invest their credits

Figure 1. PPGTP project locations across Canada



where it made the most environmental and economic sense, while broadening the distribution of investments geographically and across pulp and paper subsectors.

The PPGTP was designed in this way following consultation with the industry. It enables the efficient application of funds to profitable and competitive mills, maximizing the long-term benefits associated with this government funding. Also, the program, which is technology neutral, was designed to minimize market distortions by offering producers little to no incentive to increase or decrease production volumes.

Program achievements

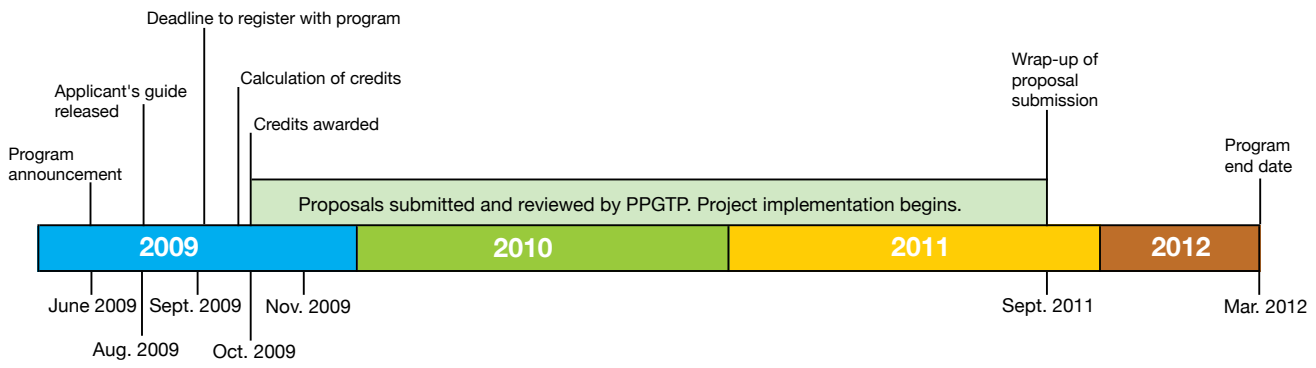
In January 2012, the PPGTP achieved its funding target, having signed contribution agreements worth $950 million with pulp and paper mills across Canada.[1] Ninety-eight project proposals were approved by the program; a process that involved the preparation of contribution agreements, federal environmental impact assessments, Aboriginal consultations, on-going communication with proponents, and project monitoring and audits (Figure 2).

The value of PPGTP project funding ranged from just over $80,000 to over $100 million dollars. The average value of PPGTP contributions was $9.7 million, with a median value of $4.1 million.

Through its emphasis on green capital investments, this program builds on the potential for environmental improvements to generate revenue streams and reduce costs, thus contributing to the transformation of the Canadian pulp and paper sector and generating lasting

1 $1 billion minus the program operating costs and reserves for year-to-year cash management.

Figure 2. Key program dates



benefits for mills and the communities they support. The remainder of this report will detail the environmental, economic and social results of the PPGTP, which will help stakeholders better understand the implications of this program in the context of the challenges and opportunities facing this important industrial sector.

Environmental results

Energy

Core benefits of the PPGTP include increased production of renewable energy by Canadian pulp and paper mills and improvements to their energy efficiency. Several project types increase the amount of renewable energy generated by recipient mills, including converting fossil fuel boilers to biomass, installing new turbines and/or generators and upgrading recovery boilers. Producing energy from renewable sources supports Canada's goal of becoming a clean energy superpower. It also offsets the production of energy from greenhouse gas (GHG)-intensive fossil fuels by conventional power plants.

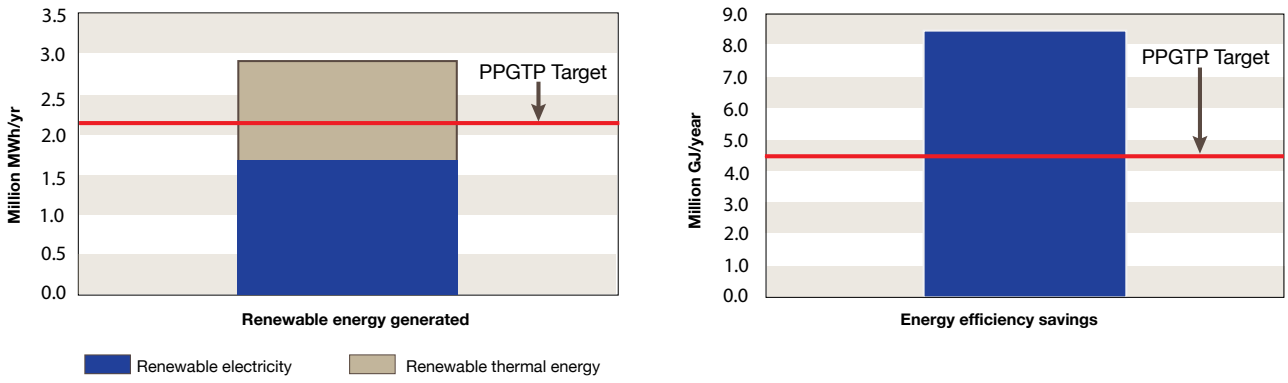
The types of renewable energy generated by PPGTP projects include thermal energy (steam) and electrical energy produced from the combustion of biofuels, such as hog fuel and black liquor. PPGTP projects are expected to generate 1.66 million megawatt hours (MWh) of renewable electricity and 4.4 million gigajoules (GJ) of renewable thermal energy per year (Figure 3). Collectively, this is enough to continuously power all of the houses in Calgary, Alberta (StatsCan 2011a).

Improvements to the energy efficiency of mills were also considered a core environmental benefit of this program. PPGTP projects are together expected to save 8.5 million GJ of energy per year (see Figure 3) – enough to heat all the houses in the city of Québec on an ongoing basis (StatsCan 2011a).

Improving energy efficiency and substituting other fuels for fossil fuels in mill processes directly reduce GHG emissions and lower the sector's contribution to climate change. Projects completed under the PPGTP are expected to reduce direct[2] GHG emissions by Canadian mills by

2 Direct GHG emissions are those emissions associated with the combustion of fossil fuels such as heavy oil and natural gas on mill sites.

Figure 3. Expected and targeted renewable energy and energy efficiency benefits of PPGTP projects



543 000 tonnes per year (t/yr) – the equivalent of the annual emissions of approximately 150 000 cars. These reductions represent more than 12 percent of the annual GHG emissions of the entire Canadian pulp and paper sector (Environment Canada, 1990–2009). This reduction is in addition to the 67 percent reduction in GHGs achieved by the sector between 1990 and 2007 (Forest Product Association of Canada [FPAC] 2011a).

Air

The Prince George Pulp Mill Odour Reduction project has been well received by local residents and community groups. This project is one of four that Canfor Pulp implemented in Prince George, British Columbia. A significant improvement in local air quality will be a primary result of these projects. They will also generate new renewable energy, improve energy efficiency and reduce GHG emissions.

The $11 million Odour Reduction project is expected to reduce the intensity and frequency of odour events by 60 percent. This project may have already achieved its goals because after the project was completed and the mill restarted, local residents did not realize that the mill was in operation. Some residents even called the mill to check if it was running again!

Atmospheric emissions from pulp and paper mills are a concern for some communities. The PPGTP has provided an opportunity for companies to upgrade their emissions-control equipment, collect and burn more of the emissions from their industrial processes and reduce their use of emissions-intensive fossil fuels, thus improving the air quality in regions surrounding recipient mills.

"One of the best things we could do in Prince George to diversify the economy and create new opportunities for industry is to improve the airshed. I cannot underline enough how important air quality is to this community, and I cannot think of a better use of these funds." - Terry Robert, President, Prince George Air Improvement Roundtable, July 13, 2011

PPGTP projects are expected to reduce mill emissions of sulphur dioxide (SO_2) by approximately 5000 t/yr, total reduced sulphur (TRS) by approximately 725 t/yr and total particulate matter by 2200 t/yr. SO_2 is part of a group of pollutants that contributes to smog and acid rain events, and TRS is a primary cause of the odours often experienced in the vicinity of industrial facilities (Environment Canada 2011). These emission reductions build on the significant environmental improvements made before the PPGTP. Since 1990, the Canadian pulp and paper sector has reduced particulate emissions from mills by 62 percent (FPAC 2011a). Seventeen communities will benefit from air emission improvements.

Land and water

The PPGTP has also significantly reduced the impact of Canadian pulp and paper mills on local land and water resources. Projects that increase the reuse of water, better capture waste heat and reduce overall water requirements lower freshwater use and reduce effluent discharge. PPGTP projects reduced the biochemical oxygen demand loading of effluent by approximately 170 t/yr and reduced water use by nearly 11 million cubic metres per year – the amount of water needed to fill 4000 Olympic-sized swimming pools.

In addition, the increased recovery and/or combustion of wood fibre and other materials (e.g. construction and demolition debris, lime mud) reduces the amount of solid waste entering landfills. PPGTP projects are expected to reduce the amount of solid waste sent to landfills by more than 170 000 t/yr. This is more than the amount of residential waste generated by the entire province of Nova Scotia in 2008 (StatsCan 2011b).

"The PPGTP has assisted Northern Pulp immensely by providing much needed funds in the areas of energy reduction and environmental improvements. The implemented projects have been able to reduce the mill's dependency on fossil fuel, improve wastewater quality and reduce odour emissions from [the] facility." - Don Breen, Vice President Strategic Planning and Governmental Affairs, Northern Pulp Nova Scotia Corporation, December 12, 2011

Economic results

The environmental improvements funded by the PPGTP are linked to improved economic sustainability in two primary ways: increased revenue and cost reductions. In spite of these potential economic benefits, the extreme capital constraints facing the pulp and paper sector before the PPGTP made the likelihood of mill investment in environmental performance extremely minimal. Even projects that demonstrated high return-on-investment (ROI) were not being implemented because mills instead devoted their limited resources to emergency maintenance. The following section describes the positive economic impacts associated with the environmental improvements funded by the PPGTP.

Environmental investments also make good economic sense. PPGTP projects will add an estimated $278 million per year to Canadian mills' bottom lines – that is an ROI of 23 percent!

New revenue streams

Renewable electricity

Electricity represents a key opportunity for product diversification in the context of a changing and modernizing forest sector. In some cases, revenues from electricity sales have the potential to comprise substantial proportions of mill incomes. Governmental support for renewable electricity generation (e.g. Ontario's feed-in tariffs) further strengthens this potential profitability.

"The addition of a third product – electricity – transforms our business and enhances our viability for years to come." - Mac Palmiere, President, Howe Sound Pulp and Paper Corporation, September 8, 2010

The renewable electricity generated by PPGTP-funded projects is expected to create $149 million annually in revenues for Canadian pulp and paper mills (Figure 4). This estimate captures only those projects for which there are existing electricity purchase agreements and is based on the electricity prices set forth in those agreements. Selling this electricity will generate much needed revenue to further improve the financial position of Canadian mills and increase the proportion of electricity generated from renewable sources that is available to all Canadians.

Figure 4. Sources of value from PPGTP projects

Sources of value from PPGTP projects	Total Value (%)
Electricity exports	54
Net fuel savings	24
Other savings	11
Electrical savings	8
Carbon credits	3

Following the completion of all projects, the PPGTP is expected to add nearly 200 MW of renewable electrical capacity. This is approximately equal to the installed capacity of the Manic-1 generating station on the Manicouagan River in Quebec (Hydro-Quebec 2010). It is more than double the installed capacity of the Enbridge solar plant in Sarnia, Ontario, which occupies an area of 385 hectares (PV Tech 2010).

"GTP allowed us to get into green power in a big way. This investment helps to secure the longevity of our plant."- Daryl Nichol, Vice President Pulp, Alberta-Pacific Forest Industries Inc. (Al-Pac), June 9, 2011

Using existing pulp and paper facilities to produce electricity is a unique opportunity to increase the production of renewable power without making major alterations to the landscape and the habitats and communities found therein. This new electricity does not require new industrial developments or changes to existing harvesting practices. In addition, pulp and paper mills can generate renewable electricity regardless of weather conditions, which means the uptime of capacity installed by the PPGTP will be higher than that of conventional renewable installations (e.g. solar, wind, hydro).

Carbon markets

The emergence of carbon markets in some Canadian provinces presents a potential stream of revenue for mills that have the capacity to reduce GHGs in a cost-effective way. Currently, Alberta and British Columbia have policies that assign a value to GHG emission reductions. Under these systems, the PPGTP generates values to firms in two ways.

First, it reduces costs: either in taxes owing ($25/t of GHGs emitted by consumers of fossil fuels in British Columbia [Government of British Columbia 2011]) or the costs of meeting legislated reductions (normally, firms would have to finance emissions reductions projects themselves or purchase offset credits).

Second, firms that are not facing binding reduction requirements or who are able to reduce their emissions by more than their regulated amount, may sell their offsets or performance credits to generate revenue (Government of Alberta 2011). The GHG reductions associated with PPGTP projects in British Columbia and Alberta are collectively expected to be worth more than $7.3 million annually to mills in these provinces. As the tax rate increases and a formal cap is introduced, the value of these GHG reductions will increase.

Energy efficiency improvements resulting from a PPGTP project at the RockTenn mill in La Tuque, Quebec, will reduce fossil fuel consumption by 49 percent (38.6 million L) per year!

New products

Domtar Corporation received $12 million under the PPGTP for the Nanocrystalline Cellulose (NCC) Demonstration Plant project in Windsor, Quebec. Domtar is partnering with FPInnovations. The project is also receiving funding from the Transformative Technologies Program ($11.2 million) of Natural Resources Canada and the Quebec Ministère des Ressources naturelles et de la Faune. The Windsor plant will produce 1 t per day of dried NCC, a specialized additive that can be used in a variety of applications such as coatings, pharmaceuticals and transportation. This new facility is the first of its scale in the world and represents a landmark in creating renewable industrial and consumer products from forest biomass.

This project has also set the foundations for a new company: CelluForce. This joint venture of Domtar and FPInnovations develops and markets new applications for NCC and is headquartered in Montréal, Quebec.

The Bio-pathways project (FPAC 2011b) highlights the role of product diversification in combination with cost-effective production of conventional forest products in the modernization of the Canadian forest sector. The PPGTP provides investment capital for environmental improvements that encourage "closed-loop" production practices that have high levels of material and energy recovery. This material recovery provides the building blocks for the production of new products, thereby adding revenue and market options for Canadian mills – revenue that, in the absence of the program, would have continued to be lost in the mill's solid waste and effluent streams.

The PPGTP and the Transformative Technologies Program of Natural Resources Canada provided the funding for Biogas Production from Mill Effluent Streams project of AV Cell Inc. in Atholville, New Brunswick. The project demonstrates the advantages of product diversification for pulp and paper mills. In collaboration with FPInnovations, the mill installed innovative, new technologies for the production and capture of biogas from mill effluent streams. This biogas can be burned to generate power, thereby replacing the use of fossil fuels.

Cost reductions

Reduced electricity use

The net savings from lower fuel and energy use associated with the PPGTP is approximately $70 million annually.

Electricity purchases comprise about 10 percent of the costs of production for recipient mills (Fisher International 2011). Reducing these costs increases a mill's profitability while reducing its sensitivity to fluctuations in the market price of power. Electricity savings associated with the PPGTP are valued at approximately $5.4 million annually (Figure 5).

Figure 5. ROI for PPGTP projects, by project type

Project type	Mean ROI (%)
Turbine	53
Energy efficiency	49
Boiler	41
Turbine and boiler	27
Others	11

Reduced use of fossil fuels

Fossil fuels are a significant expense for mills and generate GHGs and other air emissions. Mills' use of fossil fuels can be reduced by energy efficiency projects that capture waste heat and steam for reuse in mill processes or by substituting biomass for fossil fuels. Sixty-one percent of PPGTP projects reduced fossil fuel use on mill sites. Collectively, these fuel savings are worth approximately $65 million annually.[3]

3 This amount is a net cost reduction because it accounts for cost increases associated with the increased purchase of biomass in those cases where fuel switching occurs.

PPGTP projects are expected to reduce the Canadian pulp and paper sector's consumption of Bunker C oil by 40 percent! (Statistics Canada c, Preliminary 2009 data).

Other cost reductions

In addition to energy and wood fibre, significant amounts of other, often expensive, inputs are required for the production of pulp and paper. Chemical purchases represent approximately 11 percent of the cost of production for recipient mills (Fisher International 2011). Reducing chemical use has both environmental and economic advantages. As a whole, PPGTP projects decreased the use of a variety of chemicals on mill sites from bleaching chemicals, to effluent treatment nutrients, to lime kiln inputs. In addition, the significant reduction in the amount of freshwater used and effluent discharged associated with this program is expected to result in lower costs of water pumping and treatment. Cost reductions associated with lowering the quantity of solid waste sent to landfills, though not associated with the majority of PPGTP projects, can also mean significant savings for some mills.

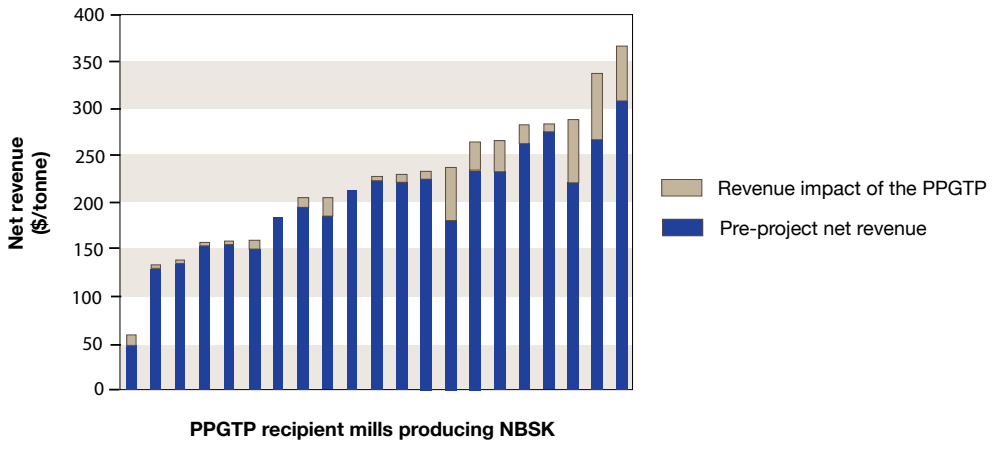
Because of PPGTP funding, the AV Nackawic pulp mill in Nackawic, New Brunswick, has been able to improve the energy efficiency of their lime kiln and significantly increase the proportion of lime mud recovered from the pulping process. This project will save enough energy to power nearly 4000 homes while also reducing airborne emissions and the amount of solid waste sent to landfills. At the same time, these improvements allow the mill to reduce the costs associated with quicklime delivery and lime residue disposal.

Indirect economic benefits

The PPGTP has had a profound impact on the economic sustainability of Canadian pulp and paper mills. According to Joe Nemeth, CEO of Canfor Pulp, the program was a "well-needed shot in the arm for the industry" (June 9, 2011). PPGTP investments have fundamentally transformed several recipient mills, making them more attractive for future investment by the company. As illustrated in Figure 6, the PPGTP increased the net revenue of recipient mills that produce northern bleached softwood kraft pulp (NBSK) by an estimated $22/t[4] (PPGTP data, Fisher International 2011). For example, in Boyle, Alberta, the PPGTP-funded installation of a condensing turbine and transmission line is only the start of the mill's green transformation. In the following years, Al-Pac intends to implement Phase II of the project, which is expected to nearly double the potential renewable electricity output of the mill – and Al-Pac is not alone. Several companies have expressed their intention to invest further in mills that received PPGTP funding.

4 This amount uses a pulp selling price before discounts of $700/t. Bars show the mills' net revenues per tonne before and after the PPGTP. In figure 6, net revenue equals revenue from selling pulp plus revenue from selling electricity, minus the direct costs of production. This calculation excludes the costs of transportation and capital, etc. and is based on Fisher International's Q2 2011 cost estimates.

Figure 6. Impact of PPGTP projects on the net revenue of recipient mills that produce NBSK



Projects completed under the PPGTP have substantially changed the economic outlook for Canadian pulp and paper mills. Improved economic sustainability for Canadian pulp and paper mills generates economic advantages not only for the companies and mill employees, but for surrounding communities and the country as a whole. Through their tax payments, pulp and paper mills, and their employees, are often significant contributors to municipal budgets. The improved profitability associated with the PPGTP has the potential to generate up to $139 million per year in corporate and business taxes.[5] The improved economic competitiveness of recipient mills supports the continued contribution of an estimated $168 million per year in personal income taxes from mill employees. As mills are often primary employers in their surrounding communities, PPGTP funding has also generated spinoff economic impacts, supporting local demand for services and products and even bringing contractors and their spending into rural communities.

"Howe Sound Pulp and Paper, located in Port Mellon, British Columbia, is by far the largest, private employer in our community. [They] provide hundreds of good paying jobs in our community and the spill-over effect is felt by every business on the coast." - Adam Major, Holywell Properties 90 Day Realty, September 30, 2011

Social results

Across Canada, the forest sector makes up at least 50 percent of the economic base in approximately 200 communities (Natural Resources Canada 2010). PPGTP investments in the pulp and paper industry have benefited several of these communities by directly fostering job security, enhancing social capital and addressing aesthetic concerns of people living near mills.

"Our hope is that with funding from the Green Transformation Program, we will be able to quickly recommence this project [. . . and] allow the region's tradesmen to go back to work. [. . .] Completing the Green Energy Project will create immediate stimulus during this recession, both locally and regionally, and maintain long-term jobs."- Brian Merwin, Vice President - Strategic Initiatives, Mercer International, November 21, 2009

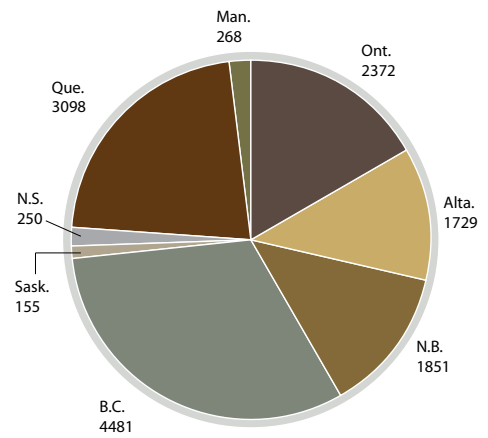
5 Using an average Canadian corporate income tax rate of 27.6 percent (OECD 2011) and the ratio of corporate income tax to other business taxes paid by Canadian industry (Wood & O'Brien, 2008).

Creating and protecting local jobs

Pulp and paper mills are the base employers in a number of towns and cities across Canada. Investments made under the PPGTP have improved the competitiveness of Canadian pulp and paper mills, thus increasing the job security of mill employees. Mills receiving PPGTP funding employ approximately 14 000 people across the country (Figure 7). PPGTP projects have also led to the creation of new permanent employment positions, as well as temporary positions during project implementation.

Approximately two indirect jobs are dependent on each job at a pulp and paper mill – that means jobs lost at mills will have a broader effect on communities (PricewaterhouseCoopers, 2007).

Figure 7. Employees at mills that received PPGTP funding, by province



"In 2008, the Thurso, Quebec, pulp mill was shut down with minimal hope that it would ever restart. A repositioning plan was put together, but like so many plans, it needed capital to be implemented. For a long time, the only confirmed source of capital for the plan was the PPGTP. With this program as a building block, hope was kept alive, and eventually repositioning of the mill took place. Today, more than 300 employees have returned to work as the mill transitions to dissolving pulp and a cogeneration plant is built. At one point in the middle of the crisis, the only faint light we had was the PPGTP – for the community of Thurso and the families of the workers – this program meant getting their pride back."- Marco Veilleux, COO, Fortress Specialty Cellulose, December 20, 2011

Benefits derived from PPGTP investments extend beyond the forest sector. Nearly 80 percent of the mills where PPGTP investments were made are in small communities of less than 20 000 people, so major investments like these make a noticeable difference for local businesses.

PPGTP projects provided employment for numerous construction workers. Within mill communities, PPGTP investments filled up hotels and restaurants and booked transportation companies. Through the PPGTP, a renewed focus was placed on the importance of pulp and paper engineering knowledge and skill sets, enabling consulting firms to refresh and enhance their capacities in this area.

"The PPGTP capital investment at the Domtar Kamloops mill required over 800 contractors during the 35 day shutdown to execute the 2010 mill upgrades. The economic impact to our region was significant as these contractors and engineering consultants filled our local hotels and contributed to our local businesses. When the pulp price goes down, the Kamloops mill will be more competitive and should continue to run. The PPGTP initiative will remain a legacy. Not only in the excellent way it was designed, but [in] the professional way it is being executed." - Bill Adams, Manager, Domtar Kamloops, August 29, 2011

Strengthening community capacity

The PPGTP is also a successful example of the new standard in responsible government consultation procedures. Responding to the need for transparent and effective sharing of information and involvement of Aboriginal peoples in resource management activities, the PPGTP contacted more than 60 Aboriginal groups with information about proposed projects. In several instances, the PPGTP team engaged in a formal consultation process, including discussions with Aboriginal chiefs and councils, leading to improved relationships between mills and Aboriginal groups.

The Catalyst G12 Power Increase Project, valued at $13.3 million, has strengthened the relationship between Catalyst and the Sliammon First Nation in Powell River, British Columbia. A memorandum of understanding, developed following the environmental assessment completed for this project, includes the creation of a Sliammon-Catalyst Development Fund ($75,000), as well as a long-term skills development plan and a commitment from the mill to identify employment opportunities for members of the First Nation.

These efforts also opened the lines of communication between community members, mills and the federal government. Through their experiences with the program, mill operators have gained valuable experience dealing with government processes, while the federal government gained a greater understanding of the objectives, opportunities and challenges of Canadian mills.

Aesthetic benefits

The environmental benefits achieved through the PPGTP will ultimately be advantageous to all Canadians, but the people living near mills will benefit directly from projects that preserve and enhance aesthetic components of communities. PPGTP projects will result in improvements such as reduced odorous emissions, decreased noise from mills, and the elimination of visual disturbances, such as water vapour plumes. These improvements will contribute to improving the quality of life of Canadians (Florida, Mellander & Stolarick 2009).

Conclusion

Announced in June 2009, the $1 billion PPGTP continues to drive environmental improvements in the Canadian pulp and paper sector while improving the sustainability of mills and mill-communities across the country. Projects funded under this program are expected to generate enough renewable electricity to power nearly 140 000 homes, making mills more energy self-sufficient and diversifying their revenue streams. PPGTP-funded projects are also collectively expected to allow mills to save more than 8.5 million GJ of energy per year from energy efficiency improvements – enough to heat 135 000 homes on an ongoing basis (Figure 8).

Figure 8. PPGTP achievements

Projects completed under the PPGTP will
Generate enough renewable electricity to continuously power 140 000 homes
Produce enough renewable thermal energy to continuously heat 70 000 homes
Save enough energy to heat 135 000 homes on an ongoing basis
Cut the GHG emissions of the Canadian pulp and paper sector by 12 percent from 2009 levels
Reduce mills' water use, solid waste and air emissions
The PPGTP leaves behind more sustainable mills and stronger communities, working together toward the next phase of industry transformation.

"We would not be where we are today now without the smart strategic policies introduced by governments in past budgets such as the Pulp and Paper Green Transformation Program." - Avrim Lazar, President and CEO, Forest Products Association of Canada, December 12, 2011

The program will significantly decrease mill atmospheric emissions including GHGs, particulates and odour causing gases. In fact, upon completion of all projects, the program is expected to directly reduce the GHG emissions of the entire Canadian pulp and paper sector by more than 10 percent,[6] while significantly reducing mill water use, effluent discharge and the quantities of waste sent to landfills.

By the time the program concludes in March 2012, it will have provided funding for 98 projects in 38 communities across the country and supported more than 14 000 jobs. It will have positioned this industry as a leader in environmental performance and the production of renewable energy from forest biomass, while also providing a sustainable platform from which mills can embark on the next phase of industry transformation.

6 Environment Canada 1990–2009. Calculation is based on the 2009 Inventory figure.

Acknowledgements

The Pulp and Paper Green Transformation Program thanks the following individuals and organizations for their contributions to this report and their ongoing efforts in support of the sustainability of Canada's forest sector.

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Terry Robert, Prince George Air Improvement Roundtable

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