



THE CASE FOR ACTION

As the global economy slowly emerges from the worst recession in generations, continuing job losses in Canada's forest products industry underscore that the industry isn't out of the woods yet. For every ribbon cutting at a new pellet plant creating a handful of jobs, a pulp and paper plant or sawmill announces further layoffs for hundreds of workers or permanently closes its doors. The industry continues to struggle as it adjusts to successive setbacks in recent years – from the drawn-out Canada-U.S. trade dispute over softwood lumber to new competitors from developing countries whose overall cost structure enables them to outcompete Canadian companies.

Executives, governments and communities looking for long-term solution to challenges confronting Canada's forest products industry need look no further than their existing operations. A year-long study commissioned by the Forest Products Association of Canada (FPAC) on the industry's prospects – the *Future Bio-pathways Project* – reveals that Canada's forest products industry has the potential to capitalize on the 21st Century bio-age. In addition to continuing to produce some of the industry's traditional products, there is an increasing opportunity to convert biomass – wood-fibre – into everything from electricity and heat to transportation fuels, bio-chemicals for solvents and plastics and next generation bio-materials.

That potential is already being seized by countries around the world actively transitioning to the new economy, in which renewable clean energy will play a leading role. With growing concerns about rising oil prices and energy security, the continued global focus on climate change, and the drive to generate knowledge-intensive jobs, key trading partners such as the U.S., Europe and China are retooling their economies to secure technology expertise,

About the Bio-pathways Project

The Forest Products Association of Canada (FPAC) wanted to determine how to best support the forest products industry by identifying the right transformational strategies.

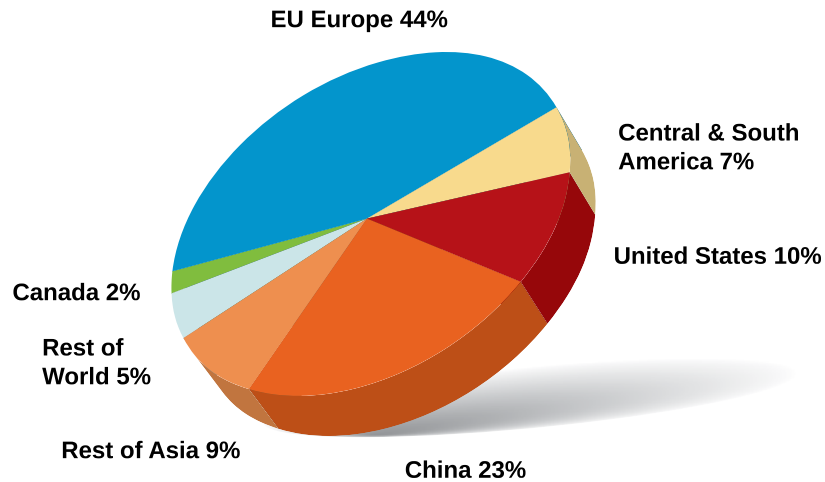
Investigators with FPAC and its lead partner, FPInnovations, examined 16 traditional and 11 emerging bio-industries to assess how wood fibre could create bio-energy, bio-chemicals and other bio-products.

By offering a balanced perspective that verifies facts vs. hype and by building bridges to connect traditional forestry companies with emerging bio-firms, FPAC's goal is to enable Canada's forest products industry to profit from the bio-economy in order to sustain and create jobs, increase revenues and create a healthier environment that benefits Canadians and the global community.

create employment, attract investments and capture fast-growing markets for more 'natural' products. From bio-fuels in Brazil to biomass energy in the E.U., governments the world over are establishing policies, providing financial incentives and luring investors keen to cash in on the next big opportunity.

If Canadian governments and the forest products industry heed the lessons from abroad, Canada can look forward to maintaining value-added jobs that will keep many rural communities viable and provide an alternative and renewable source of low-cost clean energy, and bio-products while enabling Canada to meet its greenhouse gas reduction targets.

GLOBAL BIOMASS ENERGY INVESTMENTS 2005-2009



The U.S. is not alone. Economies around the globe are very active in the bio-energy arena - establishing policies; financial incentives; and attracting investments. Different regions are focussing on different bio-energy forms (e.g. bio-fuels in Brazil; biomass in Europe and both in U.S.)

Source: New Energy Finance

The Forest Products Association of Canada's comprehensive study has concluded this vision is achievable with decisive action by public and private sectors. While some parts of the industry will continue to struggle, others have the potential to excel and capture new markets in a world hungry for clean energy, green jobs and climate change solutions. How? By transforming their operations to also produce bio-energy and bio-chemicals from wood fibre that can be turned into a host of innovative bio-fuels, bio-products and bio-materials.



PROJECT OVERVIEW

Given the abundance of Canada's forest resource, the number of new technologies on the cusp of commercialization and Canada's global leadership in sustainable forestry, Canada has the potential to become a bio-energy, and bio-product powerhouse.

Gathering the facts to confirm this potential was one of the main reasons FPAC undertook the *Future Bio-pathways Project*. The association purposely set out to examine the various new bio-technologies being developed to determine which ones are feasible and hold the greatest promise for the forest products industry.

An FPAC Steering Committee and Project Team – supported by FPInnovations as well as a large network of leading government, academic, environmental, and industry authorities – compiled key financial, social and environmental data comparing emerging bio-products with traditional products. The rigorous research process and wide-ranging

group of experts provided an exceptional depth of knowledge and experience to enable the study's authors to conclude which bio-options are the most promising and in the industry's best interests. This is a unique and comprehensive study that examines a broad range of options for the sector across a wide array of economic, social and environmental indicators.

To help the forest products industry make sound decisions based on research evidence, the FPAC project focused its initial investigation along three lines of inquiry to:

- Gauge the market readiness of emerging bio-technologies
- Quantify the economic, social and environmental costs and benefits associated with existing and emerging bio-products
- Examine the economics of the wood fibre supply

The project resulted in a framework for decision making regarding future investments, recognizing the inevitability of, and need for, change. A suite of interactive tools allows companies to analyze their individual

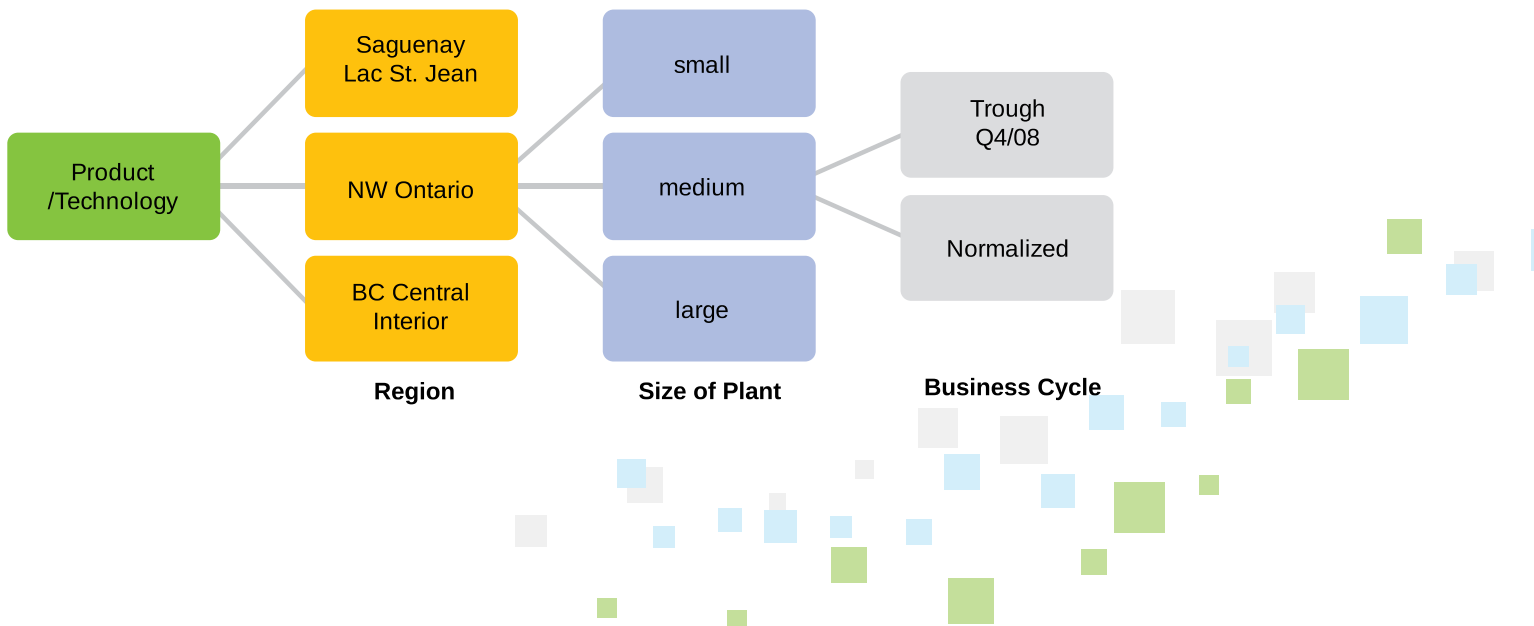
situations and gauge their best prospects. Equipped with this evidence and connected to potential partners, forest companies can seize new opportunities as the economy recovers and global demand for clean energy and bio-products increases.

PROJECT APPROACH

To ensure the study would reflect the current realities confronting Canada's forest products industry and that the findings would be relevant to the industry's needs, researchers undertook case studies of the country's three main forestry regions – British Columbia, Ontario and Quebec. The regions selected for examination provide case studies of the potential for wood fibre based bio-industries but do not represent the full range of emerging opportunities.

Researchers analyzed 16 traditional forest products (e.g. lumber, pulp and newsprint) and 11 emerging technologies by region, the size of the operation and averaged it across the typical business cycle. They assessed the financial and social impacts of each scenario to establish the best return on investment, and the greatest jobs generator.

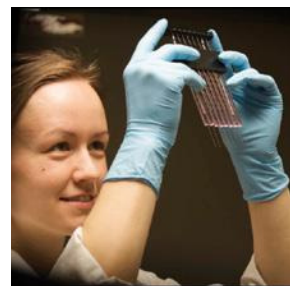
27 PRODUCT TECHNOLOGIES ARE EXAMINED IN THE FIRST ITERATION OF THE PROJECT



RESEARCH RESULTS

The *Future Bio-pathways Project* provides a compelling business and political case for integrating Canada's forest products industry with the emerging bio-economy, through bio-energy production, and bio-product creation. Investigators concluded that Canada has both a natural and a strategic advantage to grasp the enormous potential of the bio-economy.

The FPAC study identified a number of emerging bio-industries that use wood residue. A concerted effort was made to examine both technologies very close to commercialization and those in development expected to be market-ready in the next few years (3-5). While the bio-energy and bio-chemical markets are still in their infancy, the study concluded that a number of technologies hold considerable promise and are worth serious exploration. With the right investments in the right areas, the forest products industry can return to profitability and contribute to climate change solutions.

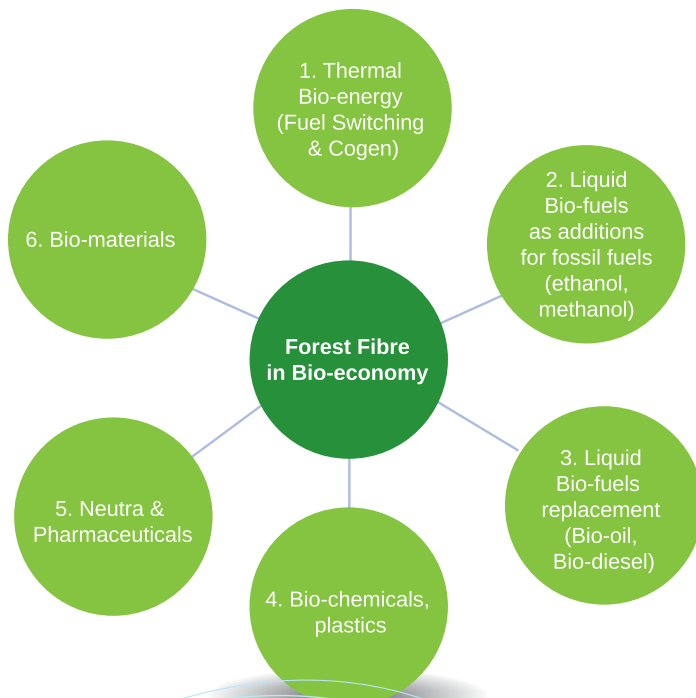


Among the most encouraging findings – the lumber sector is the cornerstone to the competitiveness of the traditional and emerging forest products industry. The lumber industry will continue be cyclical; however, over the business cycle they will be profitable.

There is good news for the pulp and paper sector, as well. Although many paper segments face very challenging economics without transformation, some segments in this sector will show financial potential under a bio-refinery scenario. In addition to pulp, this sector can become a major player in these new bio-products.

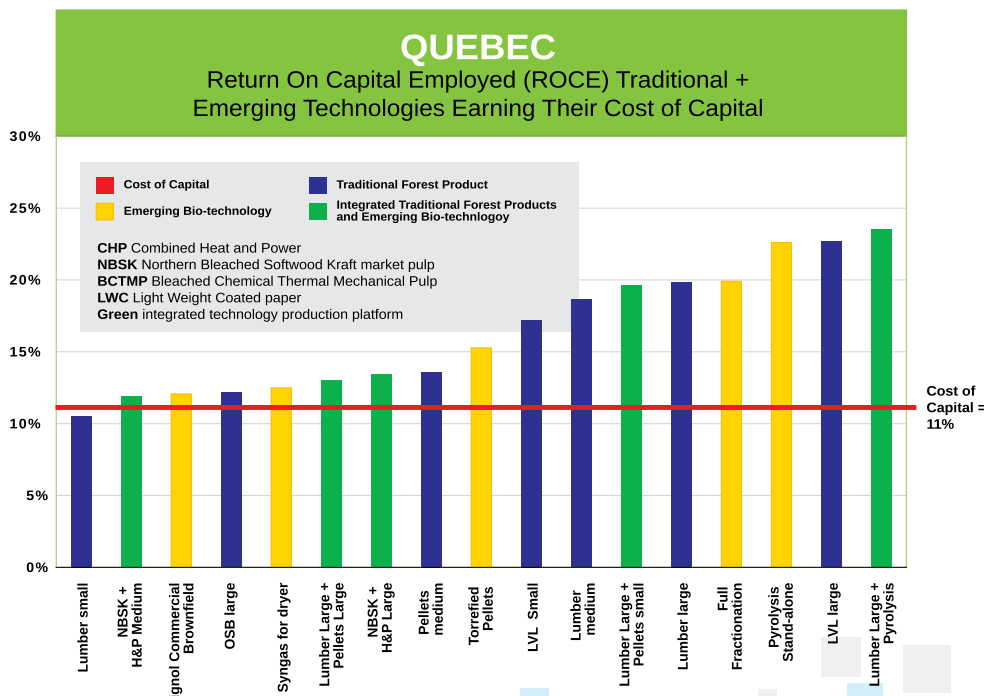
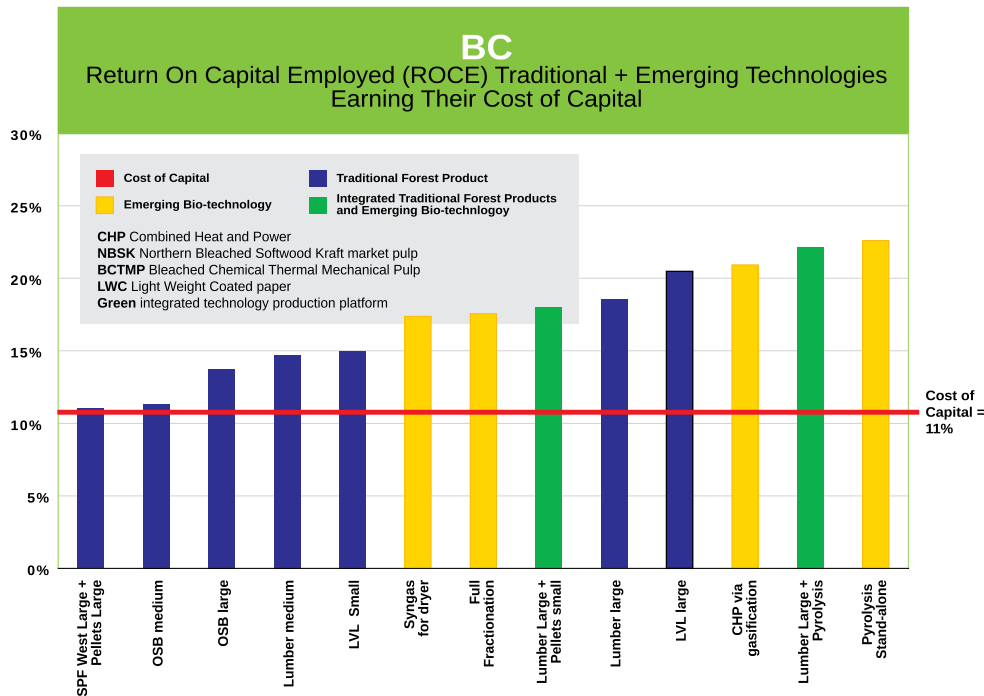
Most significantly, the research shows that bio-energy and bio-product opportunities are stronger economically and socially when integrated within the traditional industry's operations rather than on a stand-alone basis. Both the traditional and emerging bio-energy and bio-products operations enjoy higher economic returns and perform better when integrated.

FOREST BIO-PRODUCTS CONTINUUM

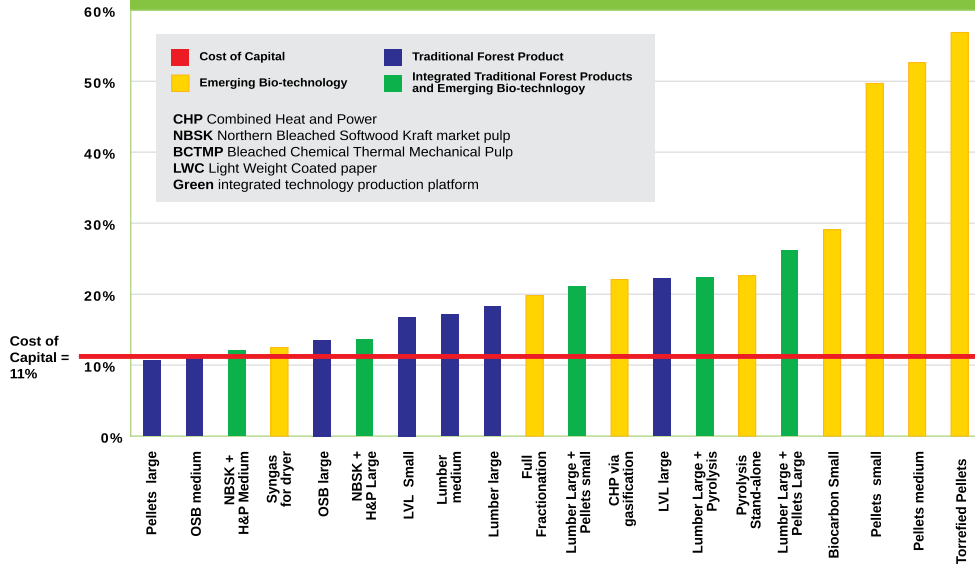


The following charts highlight the positive impacts of integrating the traditional industry with the emerging technologies. They also demonstrate the dramatic effects that government policy can play in skewing bio-industries'

performance. For example, some pellet plants fared significantly better than other sectors in Ontario, due to provincial policies aimed at promoting renewable energy production.



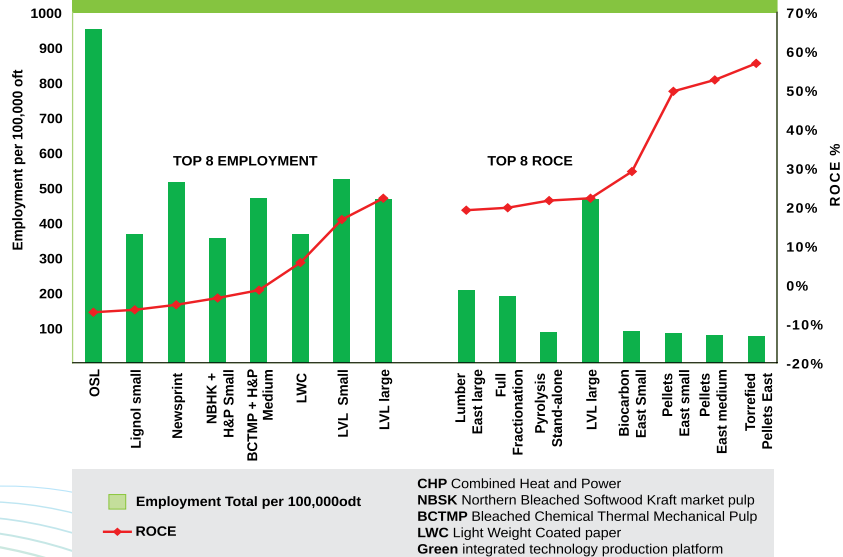
ONTARIO Return On Capital Employed (ROCE) Traditional + Emerging Technologies Earning Their Cost of Capital



The ability to produce energy, fuel and chemicals from wood fibre, along with forests' capacity to sequester carbon from the atmosphere, will change the nature of the game for Canada's forest products industry. As much as this is welcome news for forestry workers, it is also advantageous to communities and the national economy at large, since the forest products industry produces far more jobs and generates

greater GDP than emerging bio-industries in isolation. Investigators found that the employment multiplier ratios are dramatically higher with the forest products industry than with most bio-energy options. For example, new pellet mills produce few direct jobs relative to pulp mills (1:5 ratio). Therefore traditional forestry operations *integrated* with the bio-industries offer the best employment scenario.

TOP 8 EMPLOYMENT TOP 8 RETURN ON CAPITAL EMPLOYED



TIME IS OF THE ESSENCE

A blend of the old and the new – updated traditional business lines combined with sustainable bio-opportunities – will capitalize on the industry's strengths, enabling it to bounce back from its current difficulties and leap forward into the next generation economy. Companies that make the conversion can begin to cash in on a rapidly-growing international market for clean energy and carbon-neutral products. But there is no time to lose.

With few exceptions, many of Canada's traditional forest products industries are at a crossroads: they can continue on their difficult path or revitalize and capitalize on emerging global opportunities. A transformation of the sector is essential to retain and create jobs and to ensure a return on capital.

The forest products industry clearly cannot undertake this transformation on its own. Partnerships with emerging bio-industries, as well as with other sectors of the economy, are crucial if a viable bio-sector is to succeed in Canada. Neither is private sector action alone enough. The Canadian forest products industry is in the crossfire of international bio-energy financial incentives and will suffer greatly without adequate policy responses on the part of provincial and federal governments. Many of Canada's key trading partners are already pursuing bio-opportunities and leading the way in transforming their economies to remain productive and competitive in a carbon-constrained future. Canada can do no less.

Public policy makers need to recognize – and act – to support the integration of forest operations with bio-energy operations. This approach is a win for jobs, the national economy, rural communities, and the environment. Governments can support the industry by establishing a coherent policy framework



for bio-energy and bio-products that is market-driven, technology neutral – all technologies are treated equally – and enables the forest products industry to compete on a level playing field with other sectors. They can also provide the right program incentives to fast-track transformation and continue to foster innovation.



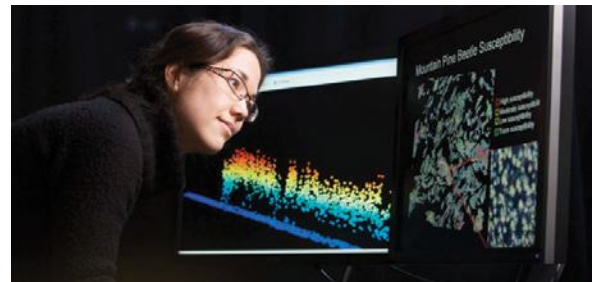
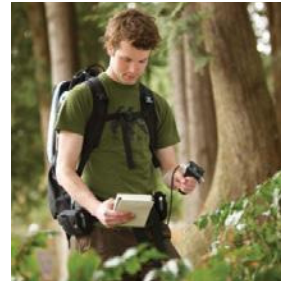
NEXT STEPS

With regulations in the works worldwide to address climate change, and growing public scepticism about the environmental risks associated with further development of oil sands and nuclear power, the time is right to showcase Canada's natural advantages and international leadership in sustainable forestry.

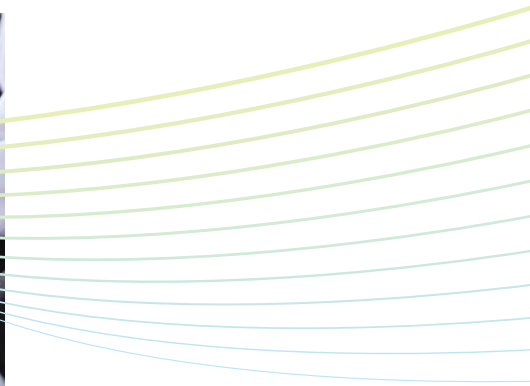
The early findings from the *Future Bio-pathways Project* represent only the first phase of analysis. What is clear from the study is that there is great potential for the forest products industry to integrate the traditional industry with emerging bio-technology to profit over the long-term through the integrated production of traditional products with bio-energy and bio-products. The forest products industry is poised to contribute significantly to the greening of the economy – and become the source of everything from wood-framing, paper, clean energy, rubber, plastic and drugs.

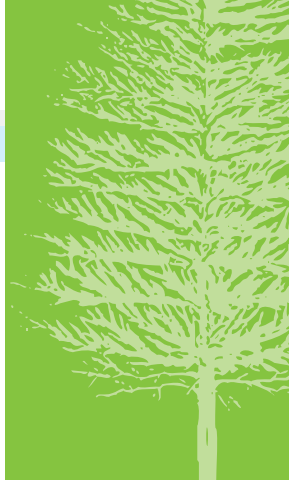
During the next phase, beginning in early 2010, FPAC will build on this effort to explore new approaches to: managing the value chain; opportunities to develop cross-sectoral partnerships; completion of the carbon footprint analysis, and gauge the market potential for wood-fibre based bio-products.

Whatever the research reveals, relentless technological change and growing global competition for knowledge-intensive industries is not going away. It is in the best interest of all Canadians to ensure Canada's forest products industry is evergreen, successfully adapting to changing circumstances and seizing new opportunities in the 21st Century bio-age.



FPAC would like to thank all those who collaborated on this project, in particular the staff of FPInnovations and Don Roberts, Managing Director of CIBC World Markets Inc. It would have been impossible to complete this work without access to the data, skills and project leadership provided by such excellent collaborators.





FOREST PRODUCTS ASSOCIATION OF CANADA

The Forest Products Association of Canada (FPAC) provides a voice for Canada's wood, pulp, and paper producers nationally and internationally in government, trade, and environmental affairs. The \$65-billion-a-year forest products industry represents almost 2% of Canada's GDP and is one of Canada's largest employers, operating in hundreds of communities and providing hundreds of thousands of direct and indirect jobs across the country.

FPAC represents the largest Canadian producers of forest products, and our members are responsible for 66% of certified forestlands in Canada. As a condition of membership, third-party certification of member companies' forest practices must be adhered to under one of three internationally recognized standards (CSA, FSC, SFI) – a world first.

FPAC's member companies adhere to five principles of sustainability:

- Harvest legally
- Regenerate promptly
- Reduce waste and promote recycling
- Reduce greenhouse gases and pursue carbon neutrality through the supply chain
- Welcome independent scrutiny of forest management practices

To learn more about FPAC and its members, please visit fpac.ca



Forest Products
Association of Canada

fpac.ca