
# In Focus: FOREST INDUSTRY COMPETITIVENESS

## INDUSTRY AND COMMUNITIES in Transition

The past few years have brought sweeping change to the companies and communities that depend on Canada's forests. Changes in timber supply, technology, exchange rates, input costs and world markets are forcing the industry to examine how it operates, what it produces and where it stands in the marketplace. Costs are rising, demand is shifting, mills are closing, firms are restructuring. And forest communities are caught up in the tide, their futures shaped by the forces of change.

What are these forces altering the forest sector? How are they influencing industry competitiveness? What of the communities at the heart of the sector? How are they weathering the transitions? How are governments and firms responding and preparing to meet the future? In answering these questions, this article paints a picture of Canada's forest sector today—coping with transition, readying itself for the future.

### THE FOREST INDUSTRY: MANY INDUSTRIES

Though it is common to refer to Canada's "forest industry," the term is something of a misnomer. Far from being a single industry, the sector consists of many mini-industries, most of which fall into two groups: wood products, and pulp and paper. The wood products industry includes lumber, panels, engineered wood products and other value-added items. Pulp and paper covers market pulp, paper products (for example, newsprint, printing and writing paper) and paperboard products (for example, boxboard, containerboard). When all product areas are combined, Canada is the world's number-one exporter of forest products, responsible for 17 percent of global wood exports.

The forest industry varies according to region as well. Eastern Canada is dominated by pulp and paper, while the west is more focused on wood products. Quebec, Ontario and British Columbia are the provinces with the highest numbers of forest workers. The Atlantic region, Quebec and British Columbia are the most forest-dependent regions, with a large share of their economy based on the sector.

Key forest exports also vary by region. The United States is by far the largest buyer of Canadian forest products, purchasing 87 percent of our wood product exports and 72 percent of our pulp and paper exports in 2004. But reliance on U.S. markets is greater in eastern Canada than in the west. Unlike the eastern provinces, British Columbia ships nearly a quarter of its wood product exports offshore and fully 60 percent of its pulp and paper exports.

## THE FORCES OF CHANGE

With unfortunate timing, a series of domestic, market and trade forces are converging on the forest sector, brewing what some observers have called a "perfect storm." These forces are shaking the competitiveness of the forest industry, a critical part of Canada's economy, and threatening the future of forest communities.

### DOMESTIC FORCES

A steady, sufficient supply of low-cost wood is an essential ingredient for a competitive forest sector. But over the past few years, Canada's fibre supply has been changing. In some regions, less wood is available for harvesting because of provincial policies to reduce the amount cut and to protect non-timber values. Quebec, for example, is dropping its annual allowable cut (AAC) by 20 percent over three years. In other regions, such as Ontario, accessibility is an issue. Supply near the major mills is dwindling, drawing the industry northward to stands that are more costly to harvest. In the east, mills in New Brunswick and Newfoundland are reporting wood shortages. In the west, some areas cleared for oil and gas exploration are not being replanted, which may affect future AAC levels. The British Columbia interior, for the moment enjoying greater supply from the salvage of beetle-infested wood, faces serious shortages once the salvage is over. (See "The Economics of Infestation" on page 58.)

Technology is another force reshaping how the forest industry does business. Technology is, in many respects, a boon. It has enabled more efficient use of what is cut. It has helped companies become more productive and compete with global producers. It has led to more value-added products and improved wood panel products, especially OSB (oriented strandboard), laminated beams and I-joists. Yet technology has brought challenges as well. It has taken a bite out of employment, with fewer workers needed to cut and process wood. Workers now need more education and different skills, which means upgrading and training. Also, because of technology, low-quality fibres from other countries are now more useable for more products, eroding a long-time market advantage for Canada—fibre quality.

Finally, the escalating cost of energy, transportation and other basic inputs has been taking a toll on companies. Energy costs have been a factor in many recent mill closures, especially in Ontario, where the price of electricity has skyrocketed by up to 30 percent. High fuel prices, which affect logging, road building and transportation, have hiked the cost of delivered wood, especially in Ontario and Quebec, where timber is often trucked long distances to mills.

### What's driving change?

DOMESTIC FORCES:
- changes in regional fibre supply
- new technology
- higher energy and other input costs

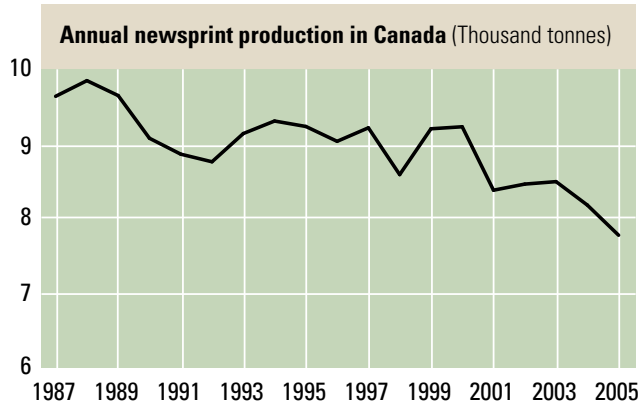
MARKET FORCES:
- shifting demand for traditional commodities
- changes in export markets
- more low-cost competitors on the global scene

TRADE FORCES:
- softwood lumber dispute
- stronger Canadian dollar

### MARKET FORCES

The global forest products market has been in flux for some time now. Demand is falling for some of the mainstays of Canada's industry. Newsprint, for example, has been hit hard by declining newspaper circulation and the rise of the Internet. At the same time, demand is growing for wood products such as OSB, which has rapidly gained market acceptance.

The geographical lines of the export market for forest products are being redrawn as well. The pulp industry, for instance, is shifting toward Asia, where booming economies are hungry for paper. At the same time, Canada is facing stiff competition from low-cost producers in Russia, Asia and South America. These operators, many of which harvest from fast-growing plantations, often have newer, larger, more efficient mills; lower labour costs; and little in the way of social and environmental protections compared to Canada. What do all these factors add up to? Tougher export markets, to the detriment of Canadian suppliers.




### TRADE FORCES

The softwood lumber dispute, which has disrupted trade between Canada and the United States for several years, remained unresolved at the beginning of 2006. However, on April 27, the Prime Minister announced that Canada and the United States had reached an agreement-in-principle to end this long-standing conflict. When finalized, the agreement will result in the end of U.S. duties on Canadian exports of softwood lumber and see some 80 percent of the duties returned to Canadian lumber producers. U.S. softwood lumber duties have cost Canadian forest companies, many of them in British Columbia, more than $5 billion. Some companies have compensated for this by decreasing their unit costs; others have had to shut down their operations.

In addition, the industry has been hurt by the stronger Canadian dollar. As our currency appreciates relative to the U.S. dollar, our products become more expensive south of the border. This is no small matter given the huge proportion of our forest product exports that go to the United States. According to estimates from the Forest Products Association of Canada, for every cent our dollar gains, there is a $528 million drop in revenue for Canadian forest companies.

## INDUSTRY IN TRANSITION

The different sectors of the forest industry are reacting to these forces in different ways. The wood product sectors are faring best, particularly in western Canada. There, lumber capacity is expanding because of the large amount of beetle-killed timber entering the wood supply. Wood panels, especially OSB, are enjoying steady market growth and healthy investment. Capacity is increasing in this sector and large OSB mills are springing up. The west is capitalizing on its proximity to Asia, increasing exports to China and other booming economies. Also, western forest companies are continuing to consolidate, creating bigger, more efficient operations that can better withstand current market forces.

The picture is grimmer, though, for pulp and paper, the backbone of the industry through much of eastern Canada. The pulp industry is saddled with steep production costs, largely because of expensive energy; high delivered wood costs, especially in the east; and production inefficiencies arising from small, aging mills. Add to this low levels of new investment in the industry and growing competition from low-cost producers and plantations abroad, and it is no surprise the Canadian pulp sector is struggling.

Newsprint is not faring much better. Sinking demand has led to a series of mill closures and heavy job losses, again with the east bearing the brunt. Some newsprint mills are switching to other types of paper production, a good move with exports of printing and writing paper on the upswing. Yet, this shift has resulted in lower profit margins, causing Canadian production of some paper grades to cease.

In short, the sectors and regions of Canada's forest industry are performing differently in the current market. The east is suffering more as a result of its struggling pulp and paper industry and reliance on

## SNAPSHOT OF THE EAST: REELING FROM CHANGE

The dozens of communities in northern Ontario that rely on the forest industry have been especially vulnerable to recent economic conditions. Shutdowns have put thousands out of work and are sending some single-industry communities into a tailspin. In Kenora, Red Rock, Dryden, Thunder Bay, Terrace Bay, Kapuskasing and other centres in Ontario's north, residents are facing huge adjustments due to layoffs, closures and limited prospects.

The same forces behind shutdowns across the country are responsible for the rash of closures in northern Ontario. But one condition is worse for Ontario—the high cost of energy. Electricity prices have skyrocketed in the province, to the point where energy makes up 30 to 40 percent of the cost of getting wood from the forest to the mill. For many companies in northern Ontario, energy has become the make-or-break number on the balance sheet.

For residents of Kenora, a town of 16 500 near the Manitoba border, the lead-up to Christmas 2005 brought devastating news. One day before Squamish, a B.C. town of the same size, learned its pulp mill would close, Kenora received parallel news. Abitibi-Consolidated said it would permanently close the town's newsprint mill, leaving 390 people without work. The closure was one of two announced by Abitibi that day, the other in Stephenville, Newfoundland and Labrador.

Energy costs were the main reason behind the closure. Abitibi spent the fall of 2005 exploring ways of lowering costs to keep the mill running at a smaller capacity. The company even asked employees to take a 20-percent wage cut while it looked into co-generation to reduce energy costs. But talks broke off in December. Abitibi CEO John Weaver said the decision to close the mill was difficult. "However, these steps are clearly necessary as we continue to face softening demand in the newsprint segment, increasing energy costs and a very strong Canadian dollar."

Several weeks earlier and 500 kilometres east, forest workers in Thunder Bay had heard a similar announcement. In late November 2005, Cascades said it was closing its coated paper plant; 375 workers were affected. The company cited a similar list of reasons: falling prices for fine paper, reduced demand, the higher cost of raw material and energy, and the strong Canadian dollar.

Late January 2006 brought more bad news to Thunder Bay, this time from South Carolina-based Bowater. Another 280 people would lose their jobs because of a kraft mill shutdown. Said Bowater's Don Campbell, "Costs to operate this kraft mill have deteriorated and are at unacceptable levels right now, mainly due to high energy costs, including electricity, but also natural gas, and then the high and unacceptable fibre costs." As often happens, the closure will affect other operations, in this case, a Buchanan-owned sawmill that had long shipped wood chips to Bowater.

What does the future hold for the forest-based companies and communities of northern Ontario? At this point, it is hard to say. Industry and unions are lobbying the province for measures that will, among other things, ease the burden of high electricity prices. Around Kenora, there is even talk of separating from Ontario and joining Manitoba, where energy is abundant and half the price. In the meantime, efforts are underway to alert urban Canadians to what the *Toronto Star* has called "a quiet devastation . . . throughout Northern Ontario's forest industry."

U.S. markets. The west is in better shape because its soft pulp and paper market is offset by a somewhat healthier wood products industry. But regardless of how the regions are weathering the storm, there is no question that the Canadian industry as a whole—and therefore the Canadian economy and society as a whole—is being buffeted.

## COMMUNITIES IN TRANSITION

By all accounts, 2005 was a tough year for forest communities in Canada. According to an analysis conducted by the Canadian Forest Service of Natural Resources Canada, more than 50 mills announced closures or significant downsizing, which resulted in nearly 9000 job losses. In fact, since 2003 mill closures have resulted in more than 16 000 announced layoffs across Canada. Many of these jobs were high-paying and based in communities where the forest industry is a cornerstone of the economy.

In these communities, non-forest businesses feel the loss as well. Each job in the forest industry supports roughly two indirect jobs. When well-paid forest workers lose their jobs, the community's income drops and other sectors, such as retail, the housing market and the service industry, fall off. The community as a whole is left with an eroded tax base, an outflow of job-seekers and, in some cases, few prospects for economic growth. The full effects of milll closures may take years to surface. By then, especially in remote communities with few alternatives to forestry, the effects may be irreversible.

Pulp and paper has been hardest hit by recent changes in the forest sector, and eastern Canada, with its reliance on pulp and paper, has been the hardest-hit region. But no part of Canada has been exempt. From Grand Falls and Stephenville in Newfoundland and Labrador, to Prince Albert, Saskatchewan, to Port Alberni, British Columbia, communities are facing shutdowns and layoffs, and the economic instability, retraining and population loss that inevitably follow. Northern Ontario, home to some of Canada's most forest-dependent communities, has been especially pummelled. So has Quebec, where the sector is readying itself for

© Natural Resources Canada; West Fraser Sawmill

even more job losses in the coming years as reduced AACs take effect.

Even communities where the forest industry is still healthy have their troubles. Increasingly, the rural and remote areas where companies operate are losing residents, especially young people, to the cities. This migration will mean labour shortages when today's aging workforce starts to retire. There are two related complications. First, hiring is low on the agenda for most forest companies faced with downsizing and closures. And second, forestry is still widely dismissed as a low-tech, low-skill sector, when the opposite is true: more than ever, the industry needs a technology-savvy, skilled workforce.

One way to address these labour problems is to mount a recruitment effort that shows the industry for what it is—a leading-edge, world-class employer. Another, some say, is to tap more effectively into Aboriginal communities. Many of these settlements are already located in the remote areas where the industry operates, and many have a growing youth population. Aboriginal communities present an excellent opportunity—a ready supply of local young people who, given the right education and training, could buoy up the forestry workforce.

Aboriginal communities have some unique concerns. Their economic ties to the forest are strong: forestry and related businesses are the main economic activity and source of earned income for 80 percent of First Nation communities. For these communities, the

## SNAPSHOT OF THE WEST: COPING WITH CHANGE

Nestled between the waters of Howe Sound and the coast mountains, Squamish, British Columbia, is a kind of bellwether for Canada's forest industry. Once a thriving forestry town, this deep-water port northwest of Vancouver has gradually bid the industry farewell. First, there were cutbacks in local logging. Then, in 2004, a major sawmill owned by Interfor was closed and dismantled, throwing 120 people out of work. In December 2005 came the knock-down punch: the closure of Woodfibre, a 93-year-old pulp mill owned by Western Forest Products (WFP), leaving 323 full-time workers unemployed.

WFP's decision to close Woodfibre speaks to the changes sweeping Canada's forest industry. The pulp mill had been on shaky financial footing for years, said the company. Rising energy costs were a factor, as was the weakening pulp market. WFP made several attempts to sell the mill, all of them unsuccessful.

For WFP, the closure of Woodfibre is part of a larger deal with Canfor. The wood chips WFP once sent to Woodfibre will now go to the Port Mellon pulp mill in Howe Sound, run by Canfor and Oji Paper Canada. In exchange, WFP will take over Canfor's logging division on northern Vancouver Island. The deal means a more secure fibre supply for Port Mellon, a larger mill than Woodfibre and one that produces both pulp and paper. It is also an important step in WFP's plan to move from pulp to the more profitable lumber sector.

WFP's decision is typical of the path the forest industry is taking in western Canada. Staying competitive means consolidating, streamlining and focusing operations where they are most profitable. But it also means shaking up the communities where the forest industry does business. "This is a difficult decision as many long-term employees are affected," said Reynold Hert, WFP's president and CEO, when announcing the closure. "Our team at Squamish has worked hard to improve operations, but it is a relatively small mill by industry standards with outdated technology and high costs."

As for the town, Squamish has been working hard to switch its economy from a traditional resource base to a more diversified one. And the future looks promising. Squamish is in a better position than some other centres to cope with the shift away from forestry. For one thing, the industry's exit from the area has been gradual. For another, the town's location between Vancouver and Whistler makes it an ideal service and bedroom community for both. Plans are currently afoot to establish a privately funded alternative university in the area. Furthermore, a myriad of natural attractions has turned Squamish into a premier outdoor destination, one that will enter the world spotlight in the run-up to the 2010 winter Olympics in Vancouver.

The closure of Woodfibre, a fixture of the community for nearly a century, remains a harsh reality in Squamish, especially for the hundreds who lost their jobs. In this town, as in so many forest towns across Canada, change in the forest industry means change in the community. In Squamish, the community is doing what it can to cope with change, looking beyond the mill to a different way of living within the forest.

pressing question, through all the industry changes, continues to be who owns and manages the forest resource. In regions where their ownership is confirmed, Aboriginal people are increasingly managing their own forests and running their own operations. In regions where ownership has yet to be settled, the outcome of land claims could greatly affect the amount of forest land under Aboriginal stewardship. How this land is managed and whether it remains, or becomes, commercially available will have an overall effect on timber supply. Certain timber licences may be impacted by changes to who is responsible for managing and harvesting. In the long run, Aboriginal entitlement to forests will usher in yet more transitions for forest companies and the communities that depend on them.

## STRATEGIES FOR CHANGE

Governments and industry have been fighting to keep up with the changes affecting the forest sector. Provincial governments, as the jurisdictions responsible for 77 percent of Canada's forests, have introduced policies and programs to assist the industry and communities. The federal government also has an important role to play, given the forest sector's importance to the national economy. Industry, for its part, has been modifying its structure and operations to become more competitive. Here is an overview of the strategies that may help Canada's forest sector steer through these troubled times.

Photo: R. Gal, with permission from Papiers Masson

**Papiers Masson: One paper machine replaces three**

### PROVINCIAL / TERRITORIAL GOVERNMENTS

At the provincial and territorial level, governments are concentrating on leveraging new capital, ensuring the long-term sustainability of wood supply and enhancing value-added manufacturing. Especially in the east, the provinces have been stepping up with policies and funding to help industry and communities change with the times. Ontario announced a $350-million loan guarantee program in June 2005, followed by a bundle of measures to combat some of the industry's worst problems. Among them are conditional grants to leverage capital for value-added manufacturing and for programs that promote efficient fibre use, worker training, electricity conservation and co-generation. In February 2006, the province pledged another $220 million to subsidize the cost of access roads and reduce stumpage fees.

Similarly, Quebec has introduced various packages to help the forest sector adjust, especially to supply reductions in the province. The most recent measures, unveiled in the government's March 2006 budget, earmarked $925 million for the sector. Besides supporting new product development, technology transfer and market diversification, Quebec is also addressing social change—helping workers return to school or the labour market and providing training and upgrading.

New Brunswick, where the forest industry is central to the economy, has likewise put together an assistance package. Besides maintaining the annual allowable cut, New Brunswick is decreasing pulpwood royalties paid to the province. It has also announced strategies to leverage capital, eliminate capital tax, cut transportation costs, promote bioenergy and upgrade workers' skills.

### FEDERAL GOVERNMENT

Since 2002–2003, the federal government has invested $531 million in the forest sector in a number of areas:

- offshore market development
- funding for forest industry research institutes
- community and worker adjustment
- advocacy and litigation for the softwood lumber dispute
- mountain pine beetle infestation
- community adjustment in Quebec.

Photo: Courtesy of Cascades Resources

**Installation of biogas energy unit at Cascades Fine Papers Group**

The Canada Wood Export Program, a five-year partnership with the wood industry begun in 2002, concentrates on diversifying Canada's offshore wood exports. Projects funded by the program have led to higher overseas sales of products such as prefabricated homes, and have boosted exports of Canadian wood products to China by more than 76 percent. Another federal program, Value to Wood, encourages research and technology transfer in value-added production.

### INDUSTRY

On the front line of current changes, the forest industry has had to react quickly and decisively to shore up its competitiveness. Its most visible strategies have involved restructuring: streamlining operations in the east, consolidating operations in the west. This restructuring is far from over. Observers predict more closures and amalgamations ahead before the sector as a whole can return to profitability.

Forest companies are also working to diversify their products and their markets. Some mills are shifting from newsprint to higher-margin papers. Some companies are getting out of pulp and paper altogether to concentrate on the more robust wood products industry. There is growing interest in bioenergy which, besides easing energy costs, could become a product line. And the industry continues to develop new niche products and seek new markets for Canadian forest goods.

Improving productivity is the other key to remaining competitive. Recent moves to close small, outdated, inefficient mills will help with overall productivity. However, innovation is crucial. Forest research institutes, universities and other R&D bodies are more important than ever in helping the industry find ways to become more efficient and gain more value from Canada's wood. (See "Innovation and Competitiveness in Canada's Forests" on page 62.)

To chart the industry's future course, the Forest Products Association of Canada (FPAC) has proposed an agenda of changes that industry and governments can make to ensure a healthy, competitive forest sector. The agenda is outlined in the February 2006 publication *Industry Vision: Building Towards the Future.*

## BUILDING A STRONG FUTURE

The changes sweeping through Canada's forest sector are not over yet. Rationalization, especially in the pulp and paper industry, is expected to continue over the next few years as companies respond to market signals and adjust their production accordingly. And forest communities, especially those with few economic alternatives, will continue to feel the effects.

Restructuring in Canada's forest sector is unavoidable. But it is also necessary if the industry and the communities that depend on it are to remain healthy and competitive in the long term. This period of transition is steering the sector on a new course, opening up new ways of capitalizing on Canada's valuable forest resources. Tapping into expanding markets such as China, developing Canada's value-added wood industry, embracing innovation and new technologies, increasing bioenergy—these are just some of the opportunities that can help forest companies and communities strengthen and rebuild for the future.

# Mountain Pine Beetle: THE ECONOMICS OF INFESTATION

At a time when the Canadian forest industry is consumed with questions of change, including change in wood supply, British Columbia's forests are being consumed much more literally. Since the mid-1990s, the mountain pine beetle has been swarming the province's pine forests, leaving behind a wake of dead and dying blue-stained trees.

The impact of this tiny invader is immense. The current epidemic has killed pines across millions of hectares and thrown forest ecosystems out of kilter in the process. And it has unbalanced the fibre supply equation in British Columbia, Canada's largest producer of wood products, turning the outbreak into a national concern. For the industry as a whole, the infestation is raising sobering questions. Chief among these questions are how to adapt operations today, how to prepare for the long-term consequences, and how to do both while balancing forest health and competitiveness.

## THE EPIDEMIC

The mountain pine beetle is native to the lodgepole pine forests of western North America and is a periodic source of disturbance in these stands. Normally, forest fires and cold temperatures combine to keep the population low. But in this case, nearly a century of wildfire suppression and recent milder winters have combined to create ideal conditions for the pest. Western forests are full of mature pine, the invader's preferred host, and the beetle's mortality rate is low. The result: the largest infestation ever recorded in North America.

Spreading at an alarming rate, by 2005, the epidemic had extended to 8.7 million hectares of British Columbia forest. To date, some 450 million cubic metres of pine have been killed—that is six years' worth of harvest at pre-infestation levels. Forecasters believe that, by 2013, some 80 percent of the province's mature pine may be affected.

What's more, research shows that the beetle's suitable range is extending to the east and north and to higher altitudes. There are outbreaks in western and southern Alberta, over the border into Saskatchewan, and in several U.S. states. (See figure on page 60.) The epidemic is now threatening different pine species, including the jack pine of the northern boreal forest. Should the beetle take hold there, the infestation could go national.

The pine beetle's mark on the forest, including ecosystems, habitat, watershed and species mix, is matched by its impact on forest companies and communities. The infestation has prompted British Columbia to raise its AAC (annual allowable cut) so that the industry can salvage wood affected by the beetle. This harvesting boost spells good economic times for industry and communities, and it is partly why western companies, especially in the wood products sector, are weathering current markets better than their eastern counterparts. But the supply boom will be short-lived. Once the salvage is over, the province will be left with damaged forests and some

## FEDERAL BEETLE ASSISTANCE

In 2002, the federal government unveiled its Mountain Pine Beetle Initiative (MPBI), a six-year, $40-million package to lessen the impact and spread of the epidemic. Administered by Natural Resources Canada, the MPBI complements provincial strategies in British Columbia and Alberta.

The MPBI is divided into land-based programs and a research program. The land-based programs have two aims. One is to provide financial and technical help to private, non-industrial forest owners affected by the beetle. The other is to address beetle-wood harvesting and forest restoration on federally managed lands, including national parks and First Nations territory. As for the research program, it promotes and shares the knowledge required for monitoring, controlling and responding to the threat of beetle spread. It also delivers options to soften the ecological, economic and social repercussions of the epidemic.

In the MPBI's first three years, 220 private and 92 First Nation forest-land projects were completed or initiated. Parks Canada has introduced more than 60 beetle-management projects in the Rocky Mountain national parks, the leading edge of the epidemic's eastward spread.

Early in 2005, the federal government gave British Columbia another $100 million to combat the effects of the infestation. The province is using the funds to deliver a three-year program that will concentrate on beetle control, fire safety, economic diversification in communities, product and market development and habitat protection.

tough challenges—among them an altered industry, a scaled-down workforce, changed communities and a pronounced impact on British Columbia's economic base.

## REACTING TODAY

The amount of beetle-killed timber in British Columbia is huge and growing. To capture some value before the wood deteriorates entirely, the province has raised the AAC and harvesting has increased. This decision has introduced a number of immediate concerns. High on the list is the question of how to balance current harvest levels with the broader goals of sustainable development, ecological health and non-timber values. Other concerns include how to manage the timber flow, how to modify operations to process salvaged timber and how to market the end products.

**Salvaged lodgepole pine with major splits and bluestain**

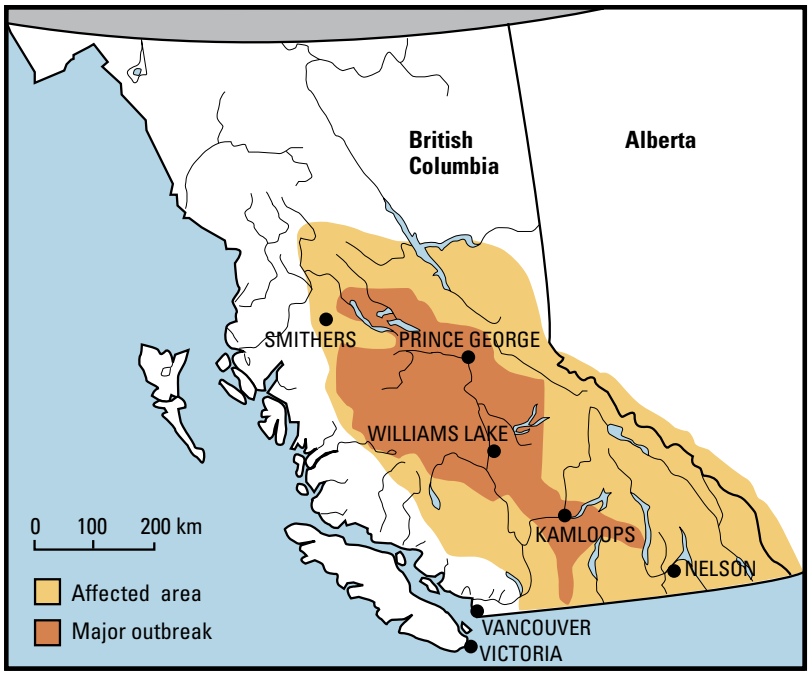
Photo: Courtesy of Paprican, 2005

For the forest industry, the key to staying healthy and competitive in the near term is to find the best ways of using and marketing this windfall of wood. Beetle-affected timber has characteristics all its own. It is more resinous and permeable than unaffected pine and is checked with cracks and splits. It is also stained blue from the fungus carried by the beetle.

These features are being investigated, with federal funding, by Canada's three national forestry research institutes—Forest Engineering Research Institute of

Canada, Forintek Canada Corp., and the Pulp and Paper Research Institute of Canada—to conclude how best to use post-beetle wood. The good news is that structurally, lumber made from this wood meets market standards. This means that much beetle-affected fibre can be used for traditional wood products. Just the same, research projects are underway to develop alternative products using the salvaged wood. Besides the work going on at the institutes, projects are being funded through British Columbia's Mountain Pine Beetle Action Plan and by Forestry Innovation Investment, a provincial Crown corporation. Here are some of the most promising uses to date.

**Total area affected by mountain pine beetle in western Canada**




Source: Natural Resources Canada (February 2005)

- Greater permeability may be an advantage for products treated with preservatives and fire retardants, such as decking, siding and termite-proof framing.
- Niche markets may emerge for blue-stained lumber products because of their unusual appearance.
- There is potential for producing glulam, as well as, wood cement and wood plastic composite products.
- The breakage from processing dry lumber will mean more wood available for remanufacturing and components.

Developing beetle-killed wood products is only half of the solution; marketing them is the other. To stay competitive now, and to pave the way for long-term opportunities, the industry needs to maintain its current markets and find new ones for new products. It needs to publicize the facts about the performance, durability and other good characteristics of beetle-affected wood. And it needs to reassure markets about regeneration and future supply in western forests.

## PLANNING FOR TOMORROW

Canada is just starting to come to terms with the long-range effects of this unprecedented attack. The physical and ecological legacy of both the infestation and the salvage harvesting is clear. But, fortunately, the outbreak, though unprecedented, is part of the natural disturbance cycle in pine forests, and the pine stands will likely recover on their own.

The commercial and social legacy is just as clear. The future shortage of timber in some of Canada's largest, most abundant forests will have obvious consequences. Estimates vary, but harvesting will likely dip 15 to 25 percent below pre-epidemic levels. Exactly how this reduction will affect western forest operations and communities is difficult to predict, but work is already underway to try to soften and offset the long-term effects.

For forest companies, getting more value from less wood may be the key to staying competitive in the face of future wood shortages. Current research could lead to new engineered wood products, for instance, that carry a higher price tag than lumber. Bioenergy is another promising avenue, one that would

enable companies to capture value from degraded pine and the waste wood left over from processing. It may also prove worthwhile to develop new and underused species as substitutes for pine in certain products.

For forest communities, the main concern is stability. This concern underlies the first objective of British Columbia's Mountain Pine Beetle Action Plan: "Encourage long-term economic sustainability for communities affected by the epidemic." The province is placing special emphasis on programs for First Nations, as more than 70 bands have traditional territories within the beetle-infested area. First Nations are particularly vulnerable to the disruption of forest ecosystems, which can affect trapping and hunting and can increase the threat of fire near isolated communities. At the federal level, the Canadian Forest Service is looking at ways to diversify the economy of communities at risk. As well, the Mountain Pine Beetle Initiative offers programs for First Nations on beetle control, forest rehabilitation and reducing fuel loads on reserves.

For industry and communities alike, long-term planning is the key to meeting this unprecedented infestation head on. For both groups, a successful future depends on diversification. The mountain pine beetle outbreak in British Columbia is without question extensive and destructive, but from this destruction may come new growth.

## INVASIVE ALIEN SPECIES—AN UNWANTED IMPORT

Canada's forests are harbouring aliens. The emerald ash borer, the gypsy moth, European scleroderris canker—these are just some of the invasive alien species threatening our country's timber. Often arriving in the wood used to pack goods in containers, these exotic pests have few, if any, natural predators here. As a result, some of the new arrivals thrive in their new home, multiply quickly and can have devastating effects. In the 20th century, for instance, chestnut blight and Dutch elm disease nearly wiped out the American chestnut and American elm from our southeastern forests. In the 1980s, the gypsy moth defoliated thousands of square kilometres in Quebec and Ontario.

Invasive alien species are attracting more attention than ever here at home and around the world. According to Canada's 2004 Invasive Alien Species Strategy, "The current threats posed by existing and potential invasive alien species are significant and are growing at an alarming rate." The World Conservation Union says alien pests are the second biggest threat to biodiversity after habitat loss.

Canada has played a key part in developing an international standard for treating solid wood packaging to kill pests. Our country is also promoting international standards to reduce the transport and introduction of invasives. As well, Natural Resources Canada is assessing, with other federal departments and with the provinces and territories, the merits of a national forest pest strategy.

Not only do alien invaders wreak havoc on the environment, they also threaten our economy. Once they gain a toehold in the forest, they can consume huge amounts of timber, taking a bite out of the industry's supply. To compound matters, invasive alien species travel in both directions. Other countries fear species that might enter their borders from Canada, and have imposed restrictions that affect our shipments and, in turn, our economy. One example is the European Union's requirement that all Canadian softwood lumber (except cedar) be heat-treated to eliminate pinewood nematodes. This measure coincided with a considerable drop in our lumber exports to the E.U.

Canada is in a double bind when it comes to invasive alien species. On the one hand, we need protection: restrictions to keep foreign pests from entering our forests. On the other hand, we need movement: continued access to our international markets. The challenge is to strike the right balance between protection and movement of goods. Arriving at that balance is in the best interest of everyone, importing and exporting nations alike.

# INNOVATION AND COMPETITIVENESS in Canada's Forests

***"To act on its challenges and attain its vision of being among the world's top three forest products nations, it is crucial that Canada's forest sector accelerate the pace of industry renewal and innovation."* (*Forest Products Association of Canada,* Forest Sector Renewal: Putting the Pieces Together, 2002)**

Photo: R. Gal, with permission from Papiers Masson

The past couple of years have been anything but smooth for Canada's forest industry. As described elsewhere in this report (see "Industry and Communities in Transition" on page 50), a number of forces—including changes in supply and demand, competition from low-cost producers, the softwood lumber dispute, higher input costs, a strong Canadian dollar—have combined to create an unsettled climate for this vital Canadian industry.

Yet the demand for forest products is there. In fact, it is growing. According to the Forest Products Association of Canada, the global appetite for forest products is expected to increase by US$4–7 billion a year for the next few years. If the Canadian industry is to help satisfy this appetite, it must adapt to the current climate. Our country's traditional advantages—high-quality fibre that is easy to access and low energy costs—have eroded over time. To keep pace, the forest sector must become more responsive to customers' needs, more diversified, more focused on getting maximum value from the forest resource. The message is clear—innovate or stagnate.

## INNOVATION AND THE FOREST SECTOR

At first glance, innovation seems like a simple concept: the creation or adoption of something new. But in the forest sector, innovation means many things. It may mean bringing a new or improved technology, process or service into a company. It may mean designing a new or improved product. It may mean changing the way a firm is organized or conducts its business. It may mean tapping into human ingenuity to dream up processes, products and solutions that no one has ever thought of before.

Innovation has long shaped Canada's forest sector. It gave rise to hardwood pulping, to oriented strandboard, to sawmills able to handle small-diameter logs and to products made from undervalued species. Thanks to innovation, the sector has improved its environmental record by reducing carbon dioxide emissions, using more biofuel for energy and leading the world in certification of sustainable forest management. In some cases, the forest sector has developed its own innovations. In others, it has looked beyond itself, becoming a leader in adopting new

technologies from other manufacturing sectors and from service providers.

Forest innovation has gone through several phases. Initially, because harvesting was the main industrial activity, research focused on improving how trees were removed from the forest. When the sector shifted its focus to production, research shifted to improving productivity and trimming manufacturing costs. Recently, the sector has taken another turn. In the face of stiff competition, marketing has become a key issue. Research is following suit, concentrating on innovations that are more customer-driven, more tailored to the marketplace.

With its history of innovation, Canada's forest sector has grown into a high-tech industry that boasts leading-edge technology. Today's mill employees are more likely to spend their days operating computers than handling hydraulic controls. Yet observers generally agree that the industry has further to go if it hopes to compete head on with other forest producers, many of which outstrip Canada in research and development (R&D) spending. The Canadian forest sector needs to push harder to improve productivity and environmental performance. It needs to develop technologies and products that use fibre more efficiently. It needs to develop more uses for residues, new by-products, alternative fuels. It needs to expand its markets and become more nimble and responsive to customers' expectations. It needs to think ahead, to create ground-breaking products and to find new markets for those products.

The way to innovate effectively, say many in the sector, is to harness the research conducted across the country and the funding available at different levels so that it serves a more unified purpose—namely, to maximize the sustainability, value and marketability of the country's forest resource. With the competitiveness of Canada's forest industry hanging in the balance, it is time for innovative research to be seen, not as a cost, but as an investment.

### THE MULTIPLICATION OF INNOVATION

Investments in innovation have the potential to pay for themselves many times over. The Canadian Forest Service's Value-Added Program, delivered by Forintek from 1998 to 2002, concluded that "as a result of the program, risks entailed in developing new value-added wood products were reduced, the length of time required to achieve change in manufacturing processes was shortened, and changes occurred that would otherwise have been unlikely to have happened." The study determined that the ratio of benefit to public-sector cost was more than 10:1, an unquestionably worthwhile use of public dollars.

## WHO ARE THE INNOVATORS?

Innovation in Canada's forest sector seldom comes about because of one scientist in one university lab, or one product designer in one company, or one technology specialist in one research centre. It comes about through a unique blend of public- and private-sector researchers, facilities, funding and ideas.

Governments, companies, universities, research institutes—all are vital links in Canada's forest innovation chain. Government researchers, at both the federal and provincial levels, tend to focus on forestry. The

Canadian Forest Service, for instance, is the largest forest science research organization in Canada, with five research centres across the country. Forest companies, on the other hand, concentrate on more competitive R&D related to products and processes; they often employ technology and service providers in their quest for innovation. As for academia, eight Canadian universities house forestry faculties whose work ranges from forest genetics to silviculture to processing to product development. Many other post-secondary institutions contribute to forest R&D through other disciplines, including biology, engineering and environmental studies.

Canada's forest sector is particularly fortunate to be able to draw on the expertise of three non-profit forest research institutes. These institutes, with funding from industry as well as support from governments (especially in the cases of FERIC and Forintek), concentrate on specific areas of forest R&D.

**Feric** (Forest Engineering Research Institute of Canada) does field-oriented research into the harvesting, processing and transportation of forest resources, as well as into silvicultural operations and small-scale forest operations. FERIC has dozens of projects active across Canada at any given time, each run by a team of scientists, researchers, industry representatives, government partners, universities, technology firms, equipment manufacturers and forest contractors.

**Forintek Canada Corp.** carries out research for the wood products industry. Forintek focuses on optimizing manufacturing processes, getting higher-value products from the available resource and meeting customers' needs for performance, durability and affordability. By transferring technology to its members, Forintek helps the industry take advantage of market opportunities created by technological innovation.

**Paprican** (Pulp and Paper Research Institute of Canada) conducts research intended to improve the competitiveness of the pulp and paper industry. Transferring technology to meet its members' needs is a large part of Paprican's mandate. The institute builds its research programs around issues such as product quality and value, cost competitiveness, environmental responsibility and sustainability.

For the forest sector, innovation is crucial at every stage—from stewardship and stand management in the forest to computerized technologies in the mill to product offerings in the market. As competition in the global forest industry heats up, many are realizing the importance of focusing Canada's research capabilities, lining them up so they serve a common end.

## FOCUSING INNOVATION

To strengthen its global competitiveness, Canada's forest sector has been re-examining the spread-out research structure that has served it in the past. In 2003, senior representatives from governments and the forest industry got together to create a national innovation strategy for the forest sector. The newly formed Canadian Forest Innovation Council (CFIC) noted, among other things, that the forest sector needs to place more emphasis on "upstream" research—research into how the forest itself (the qualities of wood and species, for instance) links upward to issues of productivity and competitiveness in the marketplace.

In response to CFIC's observation, on March 31, 2006, the Canadian Forest Service unveiled the new national Fibre Centre. This virtual centre—virtual in that it groups together existing research jobs and facilities rather than creating new ones—will develop a research program with three main aims: improving forest productivity, enhancing fibre quality and improving the forest balance sheet by either upping revenues or cutting production costs. (For more detail, see "Change and Innovation—Keeping Canada a Forestry Leader" on page 66.)

In a parallel move, work is also underway to restructure the three forest research institutes. The hope is

## B.C. FOREST RESEARCH—A CLUSTER APPROACH

June 2005 saw the launch of one example of the kind of "cluster" that may soon be guiding forest research at the regional level in Canada. Forest Research Opportunity B.C. aims to bring governments, industry and universities under one virtual research roof so that they can focus and coordinate their forest research. The goal is innovative research, productivity gains and breakthrough technology that serves the broad sector rather than just one component of it.

From an office at Forintek on Vancouver's University of British Columbia campus, Dr. Alan Potter *is* Forest Research Opportunity B.C. As the cluster's executive director, he has spent the past year identifying what kind of forest research is going on in the province and where it is happening.

"There's a big difference," Dr. Potter says, "between forestry research and forest products research. Forestry research is mainly carried out by governments and universities, forest products research mainly by private industry and the industry-sponsored research institutes." Similarly, he explains, there are distinct approaches to R&D in both domains. "Current forest science is very much about ecology and the non-timber values of the forest. But manufacturers are driven mostly by process efficiencies and profit margins. Between the two domains, the link with the ultimate value of products is often lost."

As Dr. Potter sees it, many of the issues confronting the British Columbia forest products industry are shared by the industry throughout Canada. First, there is a need to put aside the idea of endless supply and concentrate instead on sustainable forests that serve non-timber values as well as manufacturing. Second, the pulp and paper industry must look beyond commodities to more specialty products, including new biomaterials and biofuels. Finally, the wood products industry needs to broaden its focus beyond efficient production and tap the potential of engineered building solutions for residential and non-residential construction. "It's key," says Dr. Potter, "that Canada capitalize on any unique advantages its fibre has compared to plantation fibre from the southern hemisphere."

In British Columbia the forest industry faces challenges of its own. Among them is the glut of lodgepole pine salvaged from the mountain pine beetle infestation. Another is the decreased demand for green hemlock products traditionally supplied by the province's coastal mills.

Dr. Potter has concluded that harnessing the forest sector's diverse capabilities in R&D and innovation will help the industry steer through these transitions. "There is excellent potential for innovation to guide the industry in a number of areas—dealing with the impacts of the mountain pine beetle, charting a future for coastal hemlock and developing alternative products such as biofuels and biocomposites for wood fibre historically directed toward pulp and paper."

It is still early days for Forest Research Opportunity B.C. Looking ahead, Dr. Potter expects the research cluster to grow and to concentrate more on technology. "Our focus will be to bring transformative technologies to the forefront. Our role here is to set a strategic agenda that will direct available funding to where it will do the most good for the sector as a whole."

that eventually the Fibre Centre and the institutes will form the core of a new national institute for research into forest products, expected to be the largest of its kind in the world.

Other plans are in the works to establish regional research "clusters" across the country. These clusters will enable provincial governments, universities, industry and other partners to work together on innovations useful to their regions and to bring those innovations to market.

Two such clusters were launched in 2005. The first is science enterprise Algoma. Headquartered in Sault Ste. Marie, Ontario, this cluster focuses on science-based economic development and commercialization. Among other activities, the cluster is currently working to establish the proposed Centre for Excellence in Forest Innovation, as well as an invasive alien species centre. It is also involved in bioproducts and bioenergy activities. The second cluster, Forest Research Opportunity B.C., is profiled on page 65. Innovation has already carried Canada's forest sector far. From the earliest harvesting equipment to the newest GPS systems, from turn-of-the-century sawmills to the latest high-speed paper machines, the forest sector has changed with the times, then changed again. The willingness to change, to invent, to be flexible, to tap into ingenuity—this is the most valuable asset of Canada's forest sector.


# CHANGE AND INNOVATION
## —Keeping Canada a Forestry Leader

### An Interview with Brian Emmett, Assistant Deputy Minister, Canadian Forest Service

***For decades, Canada has been a leader in the forest sector. What is our main competitive advantage?***

Canada is fortunate to have one of the world's most extensive forest covers and an industry that contributes $80 billion a year to the economy. But having a huge resource endowment does not necessarily translate into competitive advantage. What really makes the difference is our people—a resource we often overlook when we speak of the forest sector.

Our firms are well-managed and generally meet very high environmental and community standards. Our forestry workers are highly trained and skilled, and they have the advanced technology they need to do their jobs. Our governments have set up a governance framework for the forest industry that demands high levels of environmental, social and economic performance.

Forestry is not just about forests; it is also about people and technology because it is people who transform the resource into value. This is where we must look for Canada's main competitive advantage as aggressive competitors vie for our markets.

***Canada's forest industry has experienced many challenges in recent years, such as low return on investment, mill closures, the softwood lumber dispute and increased competition. What must Canada do to remain a forestry leader?***

As a country and as an industry, we need to work smarter. Specific areas where I see a need for change include technology and innovation, governance, and the skills that will be required of our labour force

I think we are on the right track in terms of technology and innovation, and in restructuring our institutions to get the best value from scarce innovation dollars. We need to determine if we are spending the right amount of money in the right ways, and we need to align our research and development priorities with the needs of our clients. When I say we are on the right track in this regard, I am thinking, for example, of the new national Fibre Centre, which was recently created to group existing research jobs and facilities into one "virtual" centre (for more detail, see the preceding article on "Innovation and Competitiveness in Canada's Forests").

But we still have work to do in this area. For example, our research institutes are more fragmented than they need to be, so their member companies and governments recently agreed to amalgamate them into a single institute to create the world's largest integrated forest research institute. Among the expected advantages are increased efficiencies through the sharing of technology and best practices, and less duplication of effort.

The way governments operate and make decisions in forestry, and the relationship between governments and industry, also need to change.

Governments cannot stay the same while others are changing. They need to be innovative in their decision making and in the way they manage their affairs. I believe the single most important thing people can do in this regard is to be vigilant about the capacity of governments to carry out their roles, and insist on efficiency in government.

The traditional relationship between government and industry has been largely ad hoc—workable relationships that vary considerably from place to place and time to time. Intense competition has put an end to being able to operate this way. We need a more efficient, systematic relationship between government and industry to keep our place as a leading forest nation.

***What labour-related challenges do you see affecting the future of the forest sector?***

On the positive side, we have highly skilled, creative and talented people—the people who have built the huge industry we benefit from today. On the negative side, the industry is facing uneven labour demands, with downsizing and layoffs in some places and employee shortages due to an aging workforce in others.

The parts of the industry that are expanding are going to require a new generation of highly trained people, perhaps with much different skills, to keep the sector energetic and dynamic. Our challenge in the coming years will be to build capacity in this regard and to attract highly skilled workers by showing them that there are exciting and meaningful jobs in the forest sector.

***What do you predict for the future of Canada's forest industry?***

I am optimistic about the future, but I expect that we will have to go through some painful transitions in the coming decade. As governments, as industry and as people, we will need to make farsighted decisions. Some of these decisions will be unpopular and we may make mistakes. But that does not lessen the need for governments to play an ongoing dynamic role in making forest-sector decisions. We must be dedicated to recognizing the changes that are needed and to making the decisions that will promote as easy and as sustainable a transition as possible.

I believe the forest industry will look quite different in 10 or 20 years. As former French president Charles de Gaulle once noted, the only way to get things to stay the same is to change. I think we as a country and an industry have the courage to change and the talent to succeed—that is my prediction for the future.