



INSTITUT C.D. HOWE INSTITUTE

COMMENTARY

NO. 542

Branching Out: How Canada's Forestry Products Sector is Reshaping its Future

Wood products are now being used as the base materials for tall buildings, such as condo towers, as an important component to the nation's fuel supply, and more. With the right policies in place, Canada's forest sector can be a leader in innovation, environmental sustainability and international trade.

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COMMENTARY No. 542
May 2019
ENERGY AND NATURAL
RESOURCES;
TRADE AND INTERNATIONAL
POLICY

\$12.00

ISBN 978-1-987983-99-9

ISSN 0824-8001 (print);

ISSN 1703-0765 (online)



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THE STUDY IN BRIEF

The external forces buffeting Canada's forest sector – price swings, US trade protectionism, and shifting market demand for its core products – have challenged the sector to become an innovation leader. As a natural resource-based sector, it also has had to come to terms with the challenges of sustainability and associated changes in the regulatory environment. Today, Canada's forest sector shows potential as a leader in innovation, environmental sustainability and international trade.

Among key exporters of forest products, Canada has been more exposed to the dwindling demand for newsprint than many of its key competitors, who have been able to expand more rapidly their exports of other types of paper and related products. More generally, investments in new capacity have languished in Canada, while expansion (including by Canadian companies seeking to diversify and jump over protectionist barriers) has proceeded in the United States, Europe and elsewhere.

However, wood products are now being used as the base materials for tall buildings, such as condo towers, and as an important component to the nation's fuel supply. Meanwhile, bioplastics made from wood are being turned into everything from airplanes to product packaging. While many of these applications are in a somewhat nascent phase of development, they are fast evolving and show significant potential.

Even though the forest sector is already a leader in many parts of the emerging bio-economy and accounts for 12 percent of Canada's manufacturing sector GDP, it has the potential to do even better. Given the rapid growth in applications for wood products, supporting the forest sector directly reinforces Canada's desire to provide world-leading opportunities to its citizens in STEM professions. Moreover, sound forest management practices lead to better environmental and economic outcomes, including greater levels of carbon sequestration and increased biodiversity. Key recommendations include:

- Scale up the government contributions to FPInnovations, a non-profit innovation hub for the forestry industry, and other vehicles with a successful track record of commercialization.
- Consolidate the early product and process innovations supported by the federal government in partnership with the industry to make Canada a global leader in the emerging “tall wooden building space.”
- Endeavour to ensure “regulatory neutrality” for the use of emerging wood and wood-based products.
- Create a window supported by carbon tax revenues to drive innovative local solutions to forest management, adaption and utilization; and
- Develop a sectoral arrangement on trade in forest products with China, focused on the construction sector.

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In 1930, Harold Innis published his seminal history of *The Fur Trade in Canada*.

Dr. Innis, who told the story of the nation's economic development through the lens of that industry, famously lamented that Canadians were relegated to being “hewers of wood and drawers of water.” By contrast, nations such as the United States and the United Kingdom, he posited, were innovation leaders in manufacturing and production processes.

In the era of Dr. Innis, the forest sector was among the most basic parts of Canada's economy. Trees were turned into firewood, building materials and newsprint for the big papers in Toronto and Chicago. But as we will see, today's forest sector shows potential as a leader in innovation, environmental sustainability and international trade.

This is not to deny the significant challenges facing the sector. A country's ability to exploit its comparative advantages in global markets remains integral to its search for higher standards of living – and Canada's forests and the economic activities derived from them remain one of Canada's most significant advantages. Nevertheless, Canada's relative position in the global forest trade has been declining over the past 20 years.¹ Its lumber exports are being constrained by unfair US protectionism, while other countries have emerged alongside Canada as strong players in the market for wood pulp.

Among key exporters of forest products, Canada has been more exposed to the dwindling demand

for newsprint than many of its key competitors, who have been able to expand more rapidly their exports of other types of paper and related products. More generally, investments in new capacity have languished in Canada, while expansion (including by Canadian companies seeking to diversify and jump over protectionist barriers) has proceeded in the United States, Europe and elsewhere.

The industry's continued capacity to sustain good paying jobs and government revenues will rest on: (i) the ability to access forests and use them as productively as they are by key competitors; (ii) the ability to rely on dependable and competitive inputs and transportation costs; and (iii) the ability to export products derived from forests to large and growing markets.

Equally, however, the future, in this as in other resource-based industries, will depend on extracting greater value and generating new demand for forest-based products, through innovation and sustainability, a path along which the industry is already well started.

Indeed, wood products are now being used as the base materials for tall buildings, such as condo towers, and as an important component to the nation's fuel supply. Meanwhile, bioplastics made from wood are being turned into everything from airplanes to product packaging. While many of

The author thanks Daniel Schwanen, John Curtis, Steve Rhone, anonymous reviewers, and members of the International Economic Policy Council of the C.D. Howe Institute for comments on an earlier draft. The author also thanks the Forest Products Association of Canada for support and data. He retains responsibility for any errors and the views expressed.

- 1 Canada's earlier relative dependence on newsprint has been the dominant factor in the overall stagnation of the country's forest products exports over the 20 years since 1997, though it remains the world's top newsprint exporter. However, exports of other paper products from key competitors, including Germany, the United States, Finland, Sweden, and China, have far outpaced Canada's. The same is true for pulp, for which US exports have now passed those of Canada in top position, and exports from countries ranging from Chile to Finland and Russia have grown at a faster pace than Canada's. Canada remains the top exporter of wood, but is no longer as dominant as it was 20 years ago, with wood exports from Russia, Germany, and China, among others, having grown at a significantly faster clip since 1997. Source for the data: Forestry Production and Trade Data from FAOStat, Food and Agriculture Organization of the United Nations.

these applications are in a somewhat nascent phase of development, they are fast evolving and show significant potential.

As the old saying tells us: “necessity is the mother of invention.” Over the years, the external forces buffeting the sector – price swings, US trade protectionism, and shifting market demand for its core products, have challenged the sector to become an innovation leader. As a natural resource-based sector, it also has had to come to terms with the challenges of sustainability and associated changes in the regulatory environment.

Yet the changed nature of the forest products sector and the 210,000 jobs it provides all across the country (NRC 2019) – middle class jobs in both urban and rural areas – often seems unappreciated. Perceiving the sector the same as it was perceived in Dr. Innis’ time would not only be inaccurate but could lead to poorly informed policy choices that would hurt the industry and those employed in it as well as Canada’s global economic leadership.

Given the rapid growth in applications for wood products, which I will illustrate below, supporting the forest sector directly reinforces Canada’s desire to provide world-leading opportunities to its citizens in STEM professions. Moreover, sound forest management practices lead to better environmental and economic outcomes, including greater levels of carbon sequestration and increased biodiversity.

Even though the forest sector is already a leader in many parts of the emerging bio-economy² and

accounts for 12 percent of Canada’s manufacturing sector GDP,³ it has the potential to do even better. To advance this objective, Canadian governments should consider and remove barriers that prevent the forestry sector and forest-product-based activities from building on its – and the country’s – inherent strengths. This paper will lay out the shape of a policy and regulatory environment that would support this goal. Its key recommendations include:

- Scale up the government contributions to FPIInnovations, a non-profit innovation hub for the forestry industry, and other vehicles with a successful track record of commercialization.
- Consolidate the early product and process innovations supported by the federal government in partnership with the industry to make Canada a global leader in the emerging space for “tall wood buildings.”
- Endeavour to ensure “regulatory neutrality” for the use of emerging wood and wood-based products.
- Create a window supported by carbon tax revenues to drive innovative local solutions to forest management, adaption and utilization; and
- Develop a sectoral arrangement on trade in forest products with China, focused on the construction sector.

PART I – CANADA’S FOREST SECTOR: AN INDUSTRY OVERVIEW

Canada is a land of trees. Home to 9 percent of

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- 2 The Canadian Council of Forest Ministers define the forest bioeconomy as the “economic activity generated by converting sustainably managed renewable forest-based resources, primarily woody biomass and nontimber forest products, into value-added products and services using novel and repurposed processes.” <http://www.ccfm.org/pdf/10a%20Document%20-%20Forest%20Bioeconomy%20Framework%20for%20Canada%20-%20E.pdf>. Federal investments in green electricity have sustained more than 14,000 jobs, reduced greenhouse gas emissions by 543,000 tonnes, atmospheric emissions by about 15%, and the water used by mills by the equivalent of 4,000 Olympic-size pools. <https://www.ourcommons.ca/DocumentViewer/en/42-1/RNNR/meeting-76/evidence#Int-9794735>.
- 3 See *Value-Added Products in Canada’s Forest Products Sector: Cultivating Innovation for a Competitive Bio-Economy*. Report of the Standing Committee on Natural Resources. House of Commons. May 2018. <http://www.ourcommons.ca/Content/Committee/421/RNNR/Reports/RP9828469/rnnrrp09/rnnrrp09-e.pdf>.

the world's almost 4 billion hectares of forests, its coverage area is behind only Russia and Brazil.⁴ Canada's forests contain an estimated 47 billion cubic meters of wood, which would be enough to build 1 billion average-size single-family homes. Given Canada's emphasis on sustainability, of course, that would never happen. In fact, levels of de-forestation are negligible, with the coverage area dropping a mere 0.34 percent from 1990–2015.⁵

According to National Resources Canada, the forest sector contributes \$24.6 billion to Canada's GDP. This accounts for some 1.6 percent of the nation's total economic output. The wood products manufacturing and pulp and paper manufacturing industries account for more than 80 percent of its contribution to GDP. These broad categories capture much of the value addition that is characteristic of today's forest products economy. Nevertheless, as the uses of wood-based biomass and similar inputs continues to expand, the actual contribution of the forest sector to Canada's economy is likely to increase. A medium-term challenge will be to ensure that these emerging sources of economic value are adequately captured in the statistics.

Canada's forest industry, as noted above, is truly national in nature, almost uniquely so. Some 52 percent of the forest industry jobs are located in Ontario and Quebec. Some 39 percent of the jobs are in Western Canada. About 9 percent of the jobs are located in Atlantic Canada.

According to the Forest Products Association of Canada (FPAC), the forest sector is the economic life-blood of over 650 communities across the

country, many of them small towns and villages. Half of those communities depend on forest sector for at least 50 percent of their household income and 160 communities rely solely on forestry for their economic survival.⁶

Yet the forestry sector, unlike, say, the dairy sector, is not arguing for costly policy support to "sustain rural Canada." Rather, the preservation of forestry-related jobs outside of Canada's major cities is a consequence of a successfully managed tradeable sector.

Having said this, Canada's governments are central to administering the country's forests. In fact, provincial and territorial governments own over 90 percent of its woodlands. Companies seeking to harvest timber on crown land are required to get a license to operate and to pay stumpage fees for the production undertaken. Only 6 percent of Canada's forests are owned privately. These are mostly located in the Maritimes and British Columbia. In the United States by contrast, 63 percent of producing forestlands are privately held, including almost all of those in the east and south of the country.⁷

Canada has a wide variety of species of trees forming the basis of valuable industry. Some species, such as the spruce tree (in its various species) are found in every province. Other species, such as Douglas-fir, for example, are geographically delineated – in its case in British Columbia. Having a wide variety of woods gives Canada options in terms of product uses and export markets. It nonetheless must be said that most Canadian varieties are not unique. The United States, owing to

4 The key statistics in this section are drawn from *The State of Canada's Forests 2018 Report* unless otherwise specified. The annual report is prepared by Natural Resources Canada for the purpose of providing an overview of Canada's forests and forest industry. It is available at: <https://www.nrcan.gc.ca/forests/report/16496>.

5 According to *The State of Canada's Forests 2017 report*, Canada's forest area has declined from 348.3 million hectares in 1990 to 347.1 hectares in 2015. <http://cfs.nrcan.gc.ca/pubwarehouse/pdfs/38871.pdf>.

6 See *Economic Backbone Map*. Forest Products Association of Canada. <http://www.fpac.ca/canadian-forestry-industry/economy/>.

7 See *United States of America: Forests and forestry sector*. Food and Agriculture Organization of the United Nations. <http://www.fao.org/forestry/country/57478/en/usa/>.

Box 1: The Difference between Hardwood and Softwood

Hardwoods are not necessarily a harder – or more dense – material than softwoods. Rather, the distinction comes from the manner in which the trees reproduce. Hardwoods are “angiosperms,” meaning that their seeds fall to the ground in some sort of covering, such as a fruit over hard shell. Softwoods are “gymnosperms,” meaning that their seeds fall to the ground as is, with no covering.

Hardwoods in Canada, such as oak and maple, tend to be used for non-structural, visual applications, such as furniture, flooring and cabinets. Softwoods in Canada, such as spruce, pine and fir are favoured for structural applications, especially framing for construction.

a similar geography, has many of the same varieties. Reasonable equivalents are also found for species in locations as diverse as Chile and Russia. This means that factors such as cost of production and transportation costs to market – and protectionist measures in countries that are both competitors and large markets for Canada – are crucially important.

At 67 million cubic feet in 2017, Canada is the second-largest producer of softwood lumber in the world, after Russia. This dwarfs its hardwood production, which totalled 1.3 million cubic meters in 2017. Major types of softwoods include spruce, pine, hemlock, and fir. At present, there are over 600 mills processing softwood lumber in Canada.⁸

The most significant use of softwood lumber is in building construction. An estimated 90 percent of homes in North America are framed with “dimension lumber,” especially 2x4s, which is almost exclusively spruce, pine or fir.⁹ Considering that US housing starts hit 1.24 million in 2018¹⁰ and given that the US only produces an estimated 70 percent

of its softwood needs,¹¹ it is little wonder that Canada sells a lot of lumber in this market. In fact, Canada supplies virtually the entire US softwood shortfall.¹² It is also, sadly for Canada and for the US building industry and its customers, not surprising that the US softwood producers regularly try to limit Canadian imports and thus drive up prices in their home market.

Canada is the world’s largest producer of newsprint. This product line is declining due to the continued migration of news online. While output of newsprint fell by 8.6 percent in 2017 relative to 2016 levels, Canada still produced 3 million tonnes. There is nonetheless, a wholesale transformation underway. While some mills have closed, many others are making improvements through operational efficiency, business process change, market development and new product development.

One of the obvious examples of this change is the move by some companies up the paper value chain. There appears to be a nascent renaissance

8 See *Softwood Lumber Fact Sheet*. Natural Resources Canada. April 25, 2017. <https://www.nrcan.gc.ca/19605>.

9 *Dimension Lumber*. Natural Resources Canada. March 5, 2019. <https://www.nrcan.gc.ca/forests/industry/products-applications/15839>.

10 *New Monthly Residential Construction, December 2018*. US Census Bureau. February 26, 2019. https://www.census.gov/construction/nrc/pdf/newresconst_201812.pdf.

11 *Ibid.*

12 *Ibid.*

Box 2: The Supercalendered Paper Case: The Fight for Value-Added Paper

In March 2015, the United States announced a countervailing duty investigation of supercalendered (SC) paper imports from Canada. Specifically, the investigation focused on alleged subsidies received principally by Port Hawkesbury Paper (Nova Scotia), Irving Paper (New Brunswick) and Resolute Forest Products (Quebec). After the United States imposed countervailing duties, Canada brought a World Trade Organization (WTO) challenge in 2016.

SC paper is uncoated paper that has undergone a calendering process in which the base sheet, made of pulp and filler, is processed through a set of supercalenders in order to enhance the paper's surface characteristics by imparting a smooth and glossy printing surface while increasing its density.

The beginning of the end of this dispute came in March 2018 when Verso Corp, the main US producer of supercalendered paper, reached a settlement with Irving and the successor company of Port Hawkesbury. The two companies agreed to pay Verso a percentage of refunded duties to a maximum of \$42 million. This move to settle was seen as unusual in the annals of trade disputes, in part, because it could not guarantee that an ultimate resolution of the case. Nevertheless, upon reaching the settlement, Verso, the US company allegedly harmed by the Canadian subsidies, told the Commerce Department that it was no longer interested in continuing with the case.

The settlement was approved by the US Department of Commerce in July 2018. The US announced the revocation of its countervailing duty order and ordered the refund of duties collected from Canadian exporters of supercalendered paper since August 3, 2015. Resolute Forest Products received a refund of some \$60 million in cash deposits paid plus accumulated interest.

in parts of the magazine industry.¹³ In addition to providing more durable content, many of the growing magazines tend to be glossier and use heavier, better quality paper. Some Canadian firms are producing for this market. The growth in glossy “supercalendered” paper production in Canada led to an unsuccessful US trade action

against Canada that was resolved in 2018¹⁴ (see text box). Others are moving to new types of paper products all together. For example, Kruger recently invested \$250 million to convert its Trois-Rivières plant from newsprint to recycled content containerboard.¹⁵

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- 13 As Jon Werther, President of Meredith, the publishing company whose titles range from Time to Travel and Leisure to Sports Illustrated, say “(w)e see it as print and digital; not print or digital.” See “Print is Still Big Business in Magazine Media.” Folio. February 22, 2018. <https://www.foliomag.com/print-still-big-business-magazine-media/>. Another article on this subject is Steven McIntosh. “Magazines: How print is surviving the digital age.” *BBC News*. August 12, 2017. <https://www.bbc.com/news/entertainment-arts-40897967>.
- 14 Commerce Fact Sheet: <https://enforcement.trade.gov/download/factsheets/factsheet-canada-supercalendered-paper-cvd-initiation-031915.pdf>. Verso reaches settlement: <https://www.midlandpaper.com/verso-corporation-reaches-settlement-canadian-supercalendered-paper-producers/>. “US is Revoking Tariffs on Canadian Paper.” <https://globalnews.ca/news/4322670/us-paper-tariffs-steel-tariffs-wto/>.
- 15 Brian Taylor. “Kruger Inc. invests in Quebec mills.” *Recycling Today*. July 31, 2018. <http://www.recyclingtoday.com/article/kruger-containerboard-investments-quebec-paper-recycling/>.

THE QUESTION OF PLANTATIONS

According to Natural Resources Canada, 234.5 million hectares – or 56 percent of Canada's total forest land mass – are classed as “commercial.” The remaining land is set aside for parks and other purposes. One assertion that is commonly leveled against Canada is that its commercial forestry practices are not “competitive.”¹⁶ Critics specifically lament that Canada lacks the type of sizeable forestry plantations found in other countries, ranging from the southern United States to Scandinavia. They note correctly that the efficiency and output volumes of a well-run plantation cannot be matched by even intensive forest management techniques. Yet, the externalities associated with plantations, if not properly managed, can be considerable.

Plantation forests are characterized by “even aged stands” that are typically derived using “seedlings or clones from a common set of parents.”¹⁷ These are typically planted in rows and later clear cut at the same time. Given the emphasis on efficiency, they tend to use fast-growing trees that minimize rotation times.¹⁸ The whole system is managed through a system of “Super-Intensive Silviculture” (SIS). Not only does it involve ongoing thinning and pruning, it uses fertilizers, herbicides and pest control agents throughout the process. The Canadian experience suggests that the mean annual increment

(MAI, a measure of annual growth over a certain number of years) for plantation-grown trees is 3-12 times greater than trees in unmanaged forests.¹⁹

Due to measurement challenges, the UN Food and Agriculture Organization reports globally that Canada has no plantations (Cockwell 2012). This is not in fact the case. Commercial scale plantations actually account for an estimated 5 percent of the annual timber harvested from Canada's forests. It is true, however, that Canada is well below the estimated average global rate of 30 percent (*Ibid.*). That said, Canada has abundant “planted forests” and the distinction between these and a “plantation” can at times become murky depending on the definitions chosen.

Despite the steady interest in plantation production models within Canada's forest science community, three main factors militate against their substantial growth in Canada: 1) climate; 2) the history and the ownership structure of its forests; and 3) political considerations.

Trees in tropical climates grow faster than those in more northerly climates. Since the 1920s, there has been steady research in Canada on fast growing trees, especially poplars and willows.²⁰ While the work of creating hybrids coupled with improved forest and plantation management have dramatically increased output, wood quality and rotation times, it is always challenging to make

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- 16 See, for example, Konrad Yakabuski. “It Ain’t Pretty.” *The Globe and Mail*. November 29, 2007. <https://www.theglobeandmail.com/report-on-business/it-aint-pretty/article1090274/>. In this article, Mr. Yakabuski contrasts the Canadian experience with that of Finland. The assertion of a lack of competitiveness due to an “unwillingness” to deploy plantation-style production methods was also raised in reviews of earlier drafts of this paper.
- 17 “Estimation and Projection of Stand and Forest Conditions.” *Science Direct*. <https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/even-aged-stands>.
- 18 Andrew Park and Edward Wilson. “Beautiful Plantations: can intensive silviculture help Canada to fulfill ecological and timber production objectives?” *The Forestry Chronicle*. November/December 2007. <http://pubs.cif-ifc.org/doi/pdf/10.5558/tfc83825-6>.
- 19 *Ibid.*
- 20 G.R. Larocque, et.al. “Research on hybrid poplars and willow species for fast-growing tree plantations: Its importance for growth and yield, silviculture, policy-making and commercial applications.” *The Forestry Chronicle*. February 2013. https://www.researchgate.net/publication/235340909_Research_on_hybrid_poplars_and_willow_species_for_fast-growing_tree_plantations_Its_importance_for_growth_and_yield_silviculture_policy-making_and_commercial_applications.

additional improvements given the severe winters in much of the country.

A more significant challenge to the growth of plantations in Canada is the ownership structure of forests. As noted above, most of Canada's forests are owned largely by provincial and territorial governments. While there is much collaboration between the government and the private sector, the lack of private ownership affects the long-term investments that companies are willing to make. Simply put, companies are reticent to deploy substantial amounts of capital on land that they cannot control. Establishing and operating forest plantations is expensive and ties up a lot of capital for an extended period of time. Without sustained public support to offset the disincentives imbedded in the Canadian ownership structure, companies will continue with their current production model: acquiring licences and paying stumpage fees to allow them to harvest existing forest stock on public lands.

A related challenge is that the use of public lands is becoming politicized. Forestry plantations invariably engender concerns about monoculture, impact on species and chemical residues. Identifying ways to manage and mitigate these challenges would be essential from both a political and practical perspective. The bigger political challenge to scaling up the use of the plantation model in Canada is the growing resistance that some environmentalists have to any type of enhanced forestry project, especially using SIS techniques. Or, as Martin Weih, Professor of Plant Ecology and Eco-Physiology at the Swedish University of Agricultural Sciences, put it: "the major barriers for a rapid development of short-rotation forestry, especially in the major agricultural

regions of the boreal zone, appear not to be climatic, technical, or environmental constraints, but rather sociopolitical issues."²¹

Some critics, such as Konrad Yakabuski, might counter that Scandinavian countries, which also have cold climates and strong environment ethos, have found a way to do plantation style forestry, so surely it must be possible for Canada to emulate them.²² Finland and Sweden are, after all, major global players in the industry. Yet, the histories of Canada and Scandinavia could not be more different.

While most of the forests in Canada have been held by the Crown since before Confederation, in Sweden, almost 75 percent of all forests and in Finland some 60 percent of all forests are privately held.²³ Individuals and companies are therefore incented to make long-term investment decisions that consider economic welfare. Moreover, limited land availability embedded the ideas of forest stewardship and output efficiency in the Scandinavian ethos early on.

The over-exploitation forest resources coupled limited land mass brought forth the necessity of forest management earlier than in most parts of the world. Around Sweden's Falun Cooper mine, where forestry giant Stora, the oldest joint stock company in the world, was founded, King Charles IX issued what may be the first ever forest protection rules in 1607. (Logging and charcoal production were then integral to the mining process.)²⁴ While Scandinavia has converted its natural production limits into the maximization of its per-hectare potential, Canada has enjoyed both the blessings and challenges of natural abundance.

21 Martin Weih. "Intensive short rotation forestry in boreal climates: present and future perspectives." *Canadian Journal of Forest Research*, 2004, 34(7): 1369-1378. <http://www.nrcresearchpress.com/doi/abs/10.1139/x04-090#.XGGoos9KhEI>.

22 Yakabuski, op.cit.

23 *The Swedish Forestry Model*. <http://www.ksla.se/wp-content/uploads/2010/10/The-Swedish-Forestry-Model.pdf>. Forest Ownership. Finish Forest Association. <https://smy.fi/en/forest-fi/forest-facts/finnish-forests-owned-by-finns/>.

24 Brad Withrow-Robinson. *Postcard from Dalarna County, no. 2*. <http://blogs.oregonstate.edu/treetopics/2016/06/04/postcard-dalarna-county-no-2/>.

No country can ever import wholesale the model of another country and Canada is not going to suddenly privatize half of the government-owned land in hopes of becoming like Finland. If Canada opts not to widely deploy plantation style production models, that is a policy choice. The question would then become how to make up these forgone efficiency advantages in other ways. The expanded use of fast-growing varieties of trees is one way. Refinements in forest management, harvesting and processing techniques are another way. The development of cutting-edge products that incorporate wood and/or biomass and are not entirely dependent on “production efficiency” for their competitiveness is still another way.

PART II – FORESTRY INNOVATION: SHARING RISK, SHARING REWARD

With the 2018 publication of Mariana Mazzucato's *The Value of Everything: Making and Taking in the Global Economy* (Mazzucato 2018), the question of value, specifically who creates it and who benefits, has returned to prominence in economic debates. Dr. Mazzucato discusses at length the concepts of “value extraction” and “value addition.” Value extraction stems from either rent seeking behavior or privatizing public assets – physical and/or intellectual – for private gain. Value addition, in her view, happens through a strong state willing to take risks and through appropriately calibrated partnerships with the private sector and the government.

Using this framework, one can see the Canadian public sector and forest sector as genuine partners. Governments do not simply fund research or demand that the private sector do it on their own. Rather, they tend to pool their support for research, development, standards creation, export promotion and other activities through public-private-academic entities, such as FPIInnovations (described below), which in turn collaborates with the Canadian Wood Council, a wood products industry

association. These broad-ranging collaborative innovation and market development institutions simply do not exist in many other parts of the economy. In addition, the federal government's Scientific Research and Experimental Development (SR&ED) Tax Credit supports innovation intensive companies, including in the forest sector, in nurturing their emerging products and processes until they are ready to go to market.

Perhaps because in Canada, governments own all but a small fraction of the forested land, public institutions have developed around managing and garnering value from these resources. Concurrently, market forces in the forestry sector are constantly pushing its leading companies to develop new product offerings and strategies. Ensuring that each party, whether public or private, plays its most effective role takes focus and ongoing dialogue. Sustaining the type of collaborative partnerships found in the forestry sector, among other things, requires a regular articulation of the value they bring to the country.

Innovation Eco-System: Focus on FPIInnovations

The Canadian forest products eco-system includes institutions at the federal and provincial levels and in universities and companies. One essential institution at the heart of much of the contemporary forestry innovation eco-system is FPIInnovations. FPIInnovations took its current form in 2007 through the amalgamation of various forestry research institutes. FPIInnovations bills itself as: “a not-for-profit world leader that specializes in the creation of scientific solutions in support of the Canadian forest sector's global competitiveness and responds to the priority needs of its industry members and government partners” (Website).

The organization is headquartered in the Montreal area but has offices and research centers across the country. Its membership is vast. On

the corporate side, FPInnovations members include everyone from timber harvesters to users of sophisticated packaging. Most provincial and territorial governments are members as well as the federal government. It also includes an array of university research networks and First Nations partners. Its total budget for 2018 was \$78 million.²⁵

FPInnovations conducts research in forest operations, process and product areas ranging from environmental management, to paper and packaging innovations, to bioproducts. There is a big emphasis on creating outputs that can be commercialized. These products and techniques are typically licensed to major Canadian and international firms for the purpose of taking them to market. Examples range from new corrosion resistant alloys, that were licensed to Sandvik of Sweden, to “WoodDry” biochemicals, that were licensed to AEF Global of Quebec.²⁶ FPInnovations also undertakes a variety of joint venture partnerships that allow for risk sharing in the development of specific products and services.

While FPInnovations is undoubtedly one of Canada’s most important forestry research and development institutions, it is hardly alone. The provinces, universities and private companies across the country, as well as the federal government, run a variety of research institutions covering various elements of the extended forestry supply chain. Future public-policy priorities should be premised on strengthening these networks of collaboration.

Innovations in Canadian Forest Products

In order to illustrate the functioning of the Canadian forest products innovation model, it

is useful to examine a couple of examples. The first relates to the emergence of wood as a safe and sustainable material out of which to build skyscrapers. The second example describes a number of key applications for wood-based biomass.

Example One: Using Wood in High-Rise Applications

While wood has been the predominant building material used in the construction of single-family homes in Canada, it has been under-utilized in non-traditional construction applications such as commercial buildings or high-rises in North America. This is mainly due to regulatory impediments and public perception. Extensive research on fire and the structural performance of wood products and systems has been conducted in Canada and elsewhere. The findings demonstrate that wood buildings can be designed to be as safe as other types of construction and can meet or even exceed the building code requirements. These research efforts have led to revisions of building codes and improved perceptions among the design and construction communities and the building authorities.

The 20th Century skylines were mainly built with steel and concrete. Long-standing concerns about fire,²⁷ coupled with major technological and design advancements in steel and concrete products and systems, made these the materials of choice for high-rise construction.

All of this is changing, however, due to the recent advances in engineered wood products and building systems, including in the area of fire mitigation. Also driving the shift is an enhanced understanding

25 2017–2018 Annual Report. FPInnovations. <https://fpinnovations.ca/media/Documents/annual-reports-and-reviews-of-activities/2017-2018-annual-report.PDF>.

26 AEF Global is a Quebec City-based company specializing in the manufacture and marketing of biopesticides, which are increasingly used in the ornamental horticulture, agriculture and forestry sectors.

27 Instances such as the “Great Fire of London” (1666) and the “Great Montreal Fire” (1852) and “Great Chicago Fire” (1871) created enduring cultural concerns about the perceived fire risks associated with wood.

and concern about the environmental benefits of building with wood compared to other energy-intensive building materials.

Today we are entering what *Wired Magazine* calls “the age of timber”²⁸ – and Canada is at the forefront. One of the tallest wood buildings in the world is the 18-story Brock Commons Tallwood House, which is located on the campus of the University of British Columbia (UBC) in Vancouver.²⁹ Prior to that, the eight-storey Wood Innovation Design Center (WIDC) in Prince George, BC broke the mould.³⁰ Both these projects were designed and built by Canadian architects, engineers and contractors using Canadian building materials.

These buildings and the recently completed 13-storey Origine Eco-Condos in Quebec City, were built with prefabricated components and specially designed assemblies developed by Canadian engineering and manufacturing firms. Both the 18-storey UBC Brock Commons and the 13-storey Origine wooden towers were funded by Natural Resources Canada to showcase Canadian design and construction capacity. As the universe of tall wooden buildings grows, these suppliers are now well-positioned to take these products and expertise global.

Not only is wood safe and can look attractive, it also has significant environmental benefits. Concrete and steel account for an estimated 13 percent of carbon emissions globally.³¹ By contrast, trees absorb carbon dioxide and store it in their wood. So carbon gets locked in the buildings for their lifetimes, and even beyond if those building components are recycled or re-used. In short, wood buildings are the ultimate green buildings.

While Brock Commons has received enormous attention in the specialty and popular press, it would never have been built without the support of the 2013 Natural Resources Canada and Canadian Wood Council Tall Wood Building Demonstration Initiative (TWBDI). The Government of Canada wanted to prove that wood was a viable building material for massive scale projects as well as modest scale ones. Concurrently, FPInnovations published a *Technical Guide for the Design and Construction of Tall Wood Buildings in Canada*.³² The Brock Commons and Origine Eco-Condos were the two flagship projects of the initiative.³³

Much was learned in the construction of these two demonstration projects. Advances were made on everything from fabricating wood components at scale to fire safety engineering. The technical

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- 28 Elizabeth Stinson. “Get Ready for Skyscrapers Made Of Wood. (Yes, Wood).” *Wired Magazine*. May 30, 2017. <https://www.wired.com/2017/05/wood-skyscrapers/>.
 - 29 Brock Commons Tallwood House: Construction Overview. https://www.naturallywood.com/sites/default/files/documents/resources/brockcommons_constructionoverview_web.pdf.
 - 30 Emily Hooper. “Innovative Detail: Wood Innovation and Design Centre.” *Architect: The Journal of the American Institute of Architects*. March 24, 2015. https://www.architectmagazine.com/technology/detail/innovative-detail-wood-innovation-and-design-centre_o. The article details the innovative design and construction techniques deployed by architect Michael Green and build PCL Constructors.
 - 31 Zaria Gorvett. “Plyscrapers’: The rise of the wooden skyscraper.” *BBC*. October 31, 2017. <http://www.bbc.com/future/story/20171026-the-rise-of-skyscrapers-made-of-wood>.
 - 32 See *Technical Guide for the Design and Construction of Tall Wood Buildings in Canada*. FPInnovations. 2013. <https://fpinnovations.ca/ResearchProgram/advanced-building-systems/Pages/promo-tall-wood-buildings.aspx>. Also see Robert Jones. *Tall Wood Buildings: The Canadian Experience*. Natural Resources Canada. November 2014 for a good summary of the Guide. <http://www.woodworks.org/wp-content/uploads/TTBW-Jones-canadian-tall-wood-competition.pdf>.
 - 33 *Tall Wood Building Demonstration Initiative*. Natural Resources Canada. <https://www.nrcan.gc.ca/forests/federal-programs/20176>.

information developed through research funded by the TWBDI is “being used to support proposed changes to the 2020 edition of the *National Building Code of Canada*. These proposed changes ... aim to level the playing field for wood as a construction material.”³⁴ Specifically, the proposed revisions sought in the Code would include allowing tall wood buildings as high as 12 storeys from the current six-storey limit.³⁵

Since the construction of WIDC and Brock Commons, the interest in tall wood buildings, already growing, has exploded. Much of this seeks to directly apply the Canadian research and innovation that went into the development of these projects. Wooden towers of some 80-storeys are planned for London and Chicago while a 70-storey wooden tower has been proposed for Tokyo.³⁶ Given the strong expertise in Canada on all aspects of the design, engineering and construction of tall wooden building, Canadian professionals and materials should be in heavy demand as this transformation of global skylines takes flight. In February 2018, for example, Michael Green, the architect behind WIDC, was selected to build the largest wooden office building in the United States, which will be located in Newark, New Jersey.³⁷

With the success of the TWBDI, Ottawa announced the follow-on \$39.8 million Green Construction Through Wood Program in Budget 2017 to support demonstration buildings and other activities that will result in increasing the use of wood as a green building material in infrastructure

projects. In the tall building segment, 14 proposals were received in the first call for expressions of interest, which closed in December 2017.³⁸ With such public investments and private innovations, Canada can lead the wood building revolution.

Example Two: Biomass and Its Uses

When one thinks of consumer products derived from wood, paper products such as tissues and napkins jump most readily to mind. Yet, thanks to advances in material science supported by federal and provincial governments as well as the industry, the universe of wood and wood-containing products has exploded. By breaking wood down into its central components – cellulose, hemi-cellulose and lignin – and applying advanced nanotechnology, it is possible to shape materials that can be used to manufacture an almost infinite number of products. Some examples of contemporary household products with wood components include bath towels, toothpaste, nail polish, makeup, disinfecting wipes, and paints. Even LCD screens and ping-pong balls are now “woody.”

These products are emblematic of a shift within the forest products sector toward seeing many of its products in a broader context. The market is growing rapidly for products ranging from bioplastics, to green chemicals, to carbon fibre. According to Zion Market Research, the overall renewable chemicals market was valued at US\$49.22 billion in 2016 and is expected to

34 *Ibid.*

35 Adam Stanley. “Wood reaches new heights as a building material.” *The Globe and Mail*. November 28, 2017. <https://www.theglobeandmail.com/report-on-business/industry-news/property-report/commercial-real-estate/wood/article37099104/>.

36 Jenni Marsh. “Tokyo to build world’s tallest timber tower.” CNN. February 20, 2018. <https://www.cnn.com/style/article/wooden-skyscrapers-timber-trend-catching-fire-duplicate-2/index.html>.

37 Eleanor Gibson. “USA’s largest timber office building proposed for New Jersey.” *Dezeen*. February 6, 2018. <https://www.dezeen.com/2018/02/06/riverwalk-square-michael-green-architecture-newark-new-jersey-usa-largest-timber-office-building/>.

38 *Green Construction through Wood (GCWood) Program*. Natural Resources Canada. <https://www.nrcan.gc.ca/forests/federal-programs/gcwood/20046>.

exceed US\$100 billion in 2022.³⁹ Scientists with the Canadian Forest Service and researchers at companies across Canada are working on perfecting new commercially viable green chemicals.⁴⁰ Green chemicals are engineered to be “benign by design,” through reducing and ultimately eliminating hazardous substances in the chemical reaction process.⁴¹ In practical terms, this often means re-formatting or entirely re-inventing existing chemical reactions.

Another growth product is biofuels. Since the mid-1970s, Canada has supported the growth of ethanol production in Canada. A suite of key policy instruments are applied to drive research and scale up these products, including tax credits, loans and grants. Such biofuels are produced for a variety of purposes. Take the case of Ensyn. The company partnered with and received funding from the Ontario Government’s Center for the Research and Innovation in the Bio-Economy (CRIBE) to produce heating oil from wood-based biomass. Trees are harvested in northern Ontario forests, processed in heating oil at Ensyn’s Renfrew, Ontario facility, and exported to the New England market. CRIBE is supporting a range of these projects around the province.⁴²

There also is a lot of innovation in the self-generation of energy at manufacturing facilities. The Federal government’s Investments in Forest Industry Transformation (IFIT) partnered with

Millar Western Forest Products to produce bioenergy from an anaerobic hybrid digester facility. The technology developed by the Millar-IFIT partnership allowed for the removal of organic matter from the effluent created in the pulp and paper production process. This was then turned into biogas and used to power the pulp and paper plant. This initiative cut the plant’s electricity purchases by 11 percent and its fresh water consumption by 10 percent.⁴³

Many of the uses of biomaterials are in the creation of inputs. For example, West Fraser recently partnered with IFIT in implementing the “Kraft lignin recovery process” at commercial scale. IFIT provided \$10 million of the \$22 million needed to implement the LignoForce process. This was developed by FPInnovations and further refined by NORAM at its mill in Hinton, Alberta. The extracted lignin, which is produced at Hinton, is turned into a renewable adhesive for engineered wood products. It also is used as an additive for thermoplastics and pulp-moulded products. This investment secured over 300 existing jobs and created some new ones while opening up new markets.⁴⁴

Questions for Innovation Policy

Governments speak at length about innovation, yet the process of innovating is inherently

39 “At 11.29% CAGR, Global Renewable Chemicals Market Size to be Worth USD 102.76 Billion by 2022.” Zion Market Research. April 17, 2018. <https://www.globenewswire.com/news-release/2018/04/17/1480053/0/en/At-11-29-CAGR-Global-Renewable-Chemicals-Market-Size-to-be-Worth-USD-102-76-Billion-by-2022.html>.

40 *Ibid.*

41 McGill-NSERC CREATE in Green Chemistry. <https://www.mcgill.ca/green-chemistry-create/>. A cornerstone of green chemistry, which seeks to make chemical technologies, processes, and services that are safe, energy efficient, and environmentally sustainable, are “The 12 Principles of Green Chemistry”. These are often read in parallel with “The 12 Principles of Green Engineering.” For more information, please see: <https://www.greencentrecanada.com/green-chemistry/>.

42 *Ensyn’s Initial Facility Dedicated to RFO Production*. <http://www.ensyn.com/production.html>. Also see the Center for the Research and Innovation in the Bio-Economy (CRIBE). <https://cribe.ca/>.

43 “Investments in Forest Industry Transformation: Performance Report – 2015-2016.” Natural Resources Canada. <http://cfs.nrcan.gc.ca/pubwarehouse/pdfs/38854.pdf>.

44 *Ibid.*

unpredictable. The questions for public policy are how to improve the odds of securing “commercializable” innovations and what to do with them when they are developed. Broadly speaking, Canadian public policy should continue to support experimental “world-first” projects and key market access initiatives, including product testing.

Some recommended pathways include:

Innovation Infrastructure

- Commit to “Owning the Podium” Globally by Ramping Up Support to Canadian Forest Sector Innovations Networks: The persistent challenge that Canada has had across its economy is not idea generation. It has been the commercialization of the ideas generated and ability to take them to global scale. Given the imperative of trade diversification articulated by the Trudeau Government, experimenting with different models of taking innovations to market is essential. Given the track record of FPIInnovations at creating commercializable products and processes, I recommend that the federal government aggressively grow the annual budget for flagship FPIInnovations, and work with the provinces to further top it up, as long as it can maintain this successful commercialization track record.

While growing FPIInnovations, other specialized programs that include forestry components should be maintained as well. For example, Natural Resources Canada’s *Clean Growth Program* includes a variety of forest-sector activities, from reducing water use in the production process to minimizing landscape disturbance. These activities contribute powerfully to the country’s transition to a greener economy.

Tall Wood Building: Thinking and Acting Coherently for Results

The growing interest in tall wood buildings offers a key opportunity to begin to do things differently. Canada should commit to a holistic strategy to make itself the centre of idea generation, architecture, manufacturing and services related to tall wood buildings globally.

Canadian tax dollars funded the proof of concept demonstrating that wood buildings could be built and safely operated at scale. Manufacturers in Quebec and British Columbia designed and built the modular inputs to make these buildings possible. Moreover, the Pan Canadian Framework on Clean Growth and Climate Change explicitly encourages the increased use of wood in construction.⁴⁵

Now what?

- Use Procurement as a Mechanism to Scale Innovations: How governments spend their considerable budgets can substantially influence the evolution of key industries. Governments supported the development of the techniques and inputs behind tall wood buildings. The key design elements and wooden modular pieces that make up these buildings are Canadian. The carbon benefits of wood over steel and concrete are clear. The federal government and key provinces should therefore develop specific targets for the use of wood as a primary building material in new construction of taxpayer funded buildings as well as in retrofits. Such an initiative would generate new uses of wood – and substantial data – that could be measured and used to inform further revisions to Canada’s Building Code beyond 2020. It would also help to stabilize the supply base of inputs for these buildings and encourage architects and manufacturers to innovate further in this space. Moreover, it is consistent with the federal government’s *Greening Government Strategy*, which aims to use procurement to drive a greening of the government operations and the broader economy. This includes using

45 *Pan Canadian Framework on Clean Growth and Climate Change*. 2016. <https://www.canada.ca/en/services/environment/weather/climatechange/pan-canadian-framework/climate-change-plan.html>.

lower carbon materials in construction and renovation.⁴⁶

- Grow Canadian Innovation by Pursuing Tall Wood Building Export Initiative: The world is starting to take notice of tall wood buildings. Canada should make a comprehensive push to promote the sector as a cluster through a series of export promotion.

One an important market to prioritize is China. In 2017, China revised its building code to allow tall wood buildings to reach five storeys high (up from the previous three storeys) and to reach 18 storeys high on a case-by-case basis.⁴⁷ While technical obstacles remain, these changes mark an important step forward. Separately, a group of senior Chinese business leaders recently announced plans to significantly cut carbon emissions in the construction and real estate sectors.⁴⁸

Tall Wood Buildings seems like a prime opportunity for Canada and China to work together on a mutually beneficial solution. For example, Canada could offer to partner with China on a series of experimental tall wood buildings. Once trust and confidence are established, Canada could pursue a coherent agreement with China that would aim, by using wood as a source material, to achieve a 1 percent (for example) carbon emissions reduction for new construction of tall buildings in select Chinese cities.

Such an initiative could incent the Government of Canada to coherently organize and deliver Canadian capabilities in a manner similar to that employed by the Japanese and Koreans on key projects around Asia. Essentially these countries organize consortiums through which projects and national expertise are delivered.

The Canadian tall wood building sector needs scale and coherence in approach in order to prosper. Developing a long-term strategic partnership in a market such as China could deliver that. The Business Development Bank of Canada,, Export Development Canada, and the Trade Commissioners service could play a key role in delivery.

Regulation

The pace of innovation often outstrips the evolution of regulations. As technology is refined, policymakers are confronted with the question of how certain products are treated in regulations.

- Ensure that Wood and Wood-Based Products are on a Regulatory Level Playing Field with Other Materials: As the potential uses of wood expands, it is important for the regulations around the use of wood and wood-based products to evolve. Thirty years ago, wood was not a suitable material out of which to build skyscrapers. Now it is – and the regulations should be updated accordingly. A key principle to adopt should be that of “regulatory neutrality” for wood and wood-based products, including wood components and biomass. Much like net neutrality in the tech space, wood “neutrality” opens exciting new opportunities. This suggests the importance of a regular review, so that innovative but safe products are not stymied from the outset.
- Develop a Mechanism for Assessing the Efficacy and Competitiveness Canada’s Forest Sector Regulatory Regimes: The rules around emerging products are not the only parts of the forest economy that require regular regulatory modernization. Some combination of the federal and provincial governments, industry

46 *Greening Government Strategy*. 2017. <https://www.canada.ca/en/treasury-board-secretariat/services/innovation/greening-government/strategy.html>.

47 Haiyan Zhang. “China introduces Tall Wood Building Code.” *Canada Wood Today*. March 24, 2017. <https://canadawood.org/blog/china-introduces-tall-wood-building-code/>.

48 The Society of Entrepreneurs and Ecology, a group of leading Chinese CEOs, has recently launched its Green Supply Chain in the Real Estate Industry Initiative. For more detailed information, please see <https://www.wilsoncenter.org/event/how-low-energy-and-carbon-can-buildings-china-and-the-us-go>.

and the scientific community should develop mechanisms for assessing the efficacy and impact of key regulations governing the forest products sector across the country. These would include silvicultural regulations, rules around sawmills and forest management requirements. Invariably, forest policies bring different interests to the fore. Yet, if Canada wants a competitive forest products sector that delivers ongoing innovation, it is important to assess whether long-standing regulations are still working optimally decades after their adoption.

Measuring Innovation in Forest Products

Peter Drucker, the famed management guru, once asserted, “If you can’t measure it, you can’t improve it.” Similarly, if you measure it incorrectly, the results are equally or even more destructive. Put another way, poor measurement leads to poor policy.

- **Ensure Definitional Inclusiveness:** In The State of Canada’s Forests 2018 and similar reports, the forest industry’s categorizations of its economic impact are defined very traditionally. All sector activity is covered by: (1) forestry and logging; (2) pulp and paper product manufacturing; and (3) wood product manufacturing. This clear understates the importance of key emerging segments of the forest industry.

The Canadian Council of Forest Ministers has usefully taken a key step towards inclusiveness by providing a definition for the forest bioeconomy:

*economic activity generated by converting sustainably managed renewable forest-based resources, primarily woody biomass and nontimber forest products, into value-added products and services using novel and repurposed processes.*⁴⁹

The Council’s *Forest Bioeconomy Framework* notes that as of yet “there is little official data on Canada’s bioeconomy,”⁵⁰ whether its nature or size. Closing this gap will be important as Canada seeks to systematically grow its forest bioeconomy. Specifically, the Government of Canada, led by Natural Resources Canada and Statistics Canada, should work with the Canadian Council of Forest Ministers, the industry, universities, think tanks and the provinces on the development of a methodology for capturing the value-added part of the forestry sector more accurately. This will lay the foundation for designing more targeted policies for assisting the sector.

- **Re-define the Measurement of Forest Products Innovation:** The innovation eco-system in Canada’s forestry sector does not reflect an economist’s ideal of what an innovation eco-system should be. Such scholars tend to fixate on Canada’s Business-enterprise Research and Development (BERD) spending. The implied ideal of the BERD methodology is big US multinationals with big in-house research functions. An important challenge in forestry is that many of the innovative players in the sector are a bit downstream from the actual harvesting of trees or processing of lumber. Without a conscious commitment to capturing the end-to-end production chain, forestry’s innovative contribution to the economy can too easily be dismissed.

This limited view was exemplified in the influential 2013 Counsel of Canadian Academies report on “The State of Industrial R&D in Canada.”⁵¹ The report found that for “Forestry, Logging and Support Activities for Logging,” firms across the combined sector spent only \$14 million on R&D or 0.1 percent of the Canadian total. Moreover, these R&D investments

49 *A Forest Bioeconomy Framework for Canada*. Canadian Council of Forest Ministers. 2017. <https://www.ccfm.org/pdf/10a%20Document%20-%20Forest%20Bioeconomy%20Framework%20for%20Canada%20-%20E.pdf>.

50 *Ibid.*

51 *The State of Industrial R&D in Canada: The Expert Panel on the State of Industrial R&D in Canada*. Council of Canadian Academies. 2013. http://www.scienceadvice.ca/uploads/eng/assessments%20and%20publications%20and%20news%20releases/research%20and%20develop/ird_fullreporten.pdf.

supported only 161 full-time equivalent positions across Canada.

In its conclusions, the Council report identified four sectors of industrial R&D strength. These were:

- Aerospace products and parts manufacturing.
- Information and communication technologies (ICT).
- Oil and gas extraction.
- Pharmaceutical and medicine manufacturing.

However, a key difference between these sectors and forestry is that the major R&D processes take place closer to the prime companies. It is therefore easier to spot and capture. A more complete view of Canada's forestry innovation chain would do Canadian policy makers much good as they assess their options.

PART III – ENVIRONMENT: A WORLD-CLASS LEADER CONSTANTLY IMPROVING

Many of Canada's forest management practices are arguably second to none globally from an environmental perspective.⁵² A key strategy it has employed is to not just say it is world class, but to be certified as such by credible third parties.⁵³ In fact 49 percent of Canada's forests are certified as following recognized principles of sustainable forest management (NRC 2019).

Canada's embrace of sustainable forest management among governments and industry far and away exceeds that of any other country. In fact, Canada is home to 37 percent of the world's

total certified, sustainably managed forests. Russia is second at a distant 11 percent followed by the United States at 9 percent. The rest of the world beyond the top five only account for 32 percent (NRC 2018).

Sustainable forest management is defined by Natural Resources Canada as “a way of using and caring for forests so as to maintain their environmental, social and economic values and benefits over time.” They further note that “sustainable forest management decisions and activities are based on scientific research, rigorous planning processes and public consultation.”⁵⁴ In other words, sustainable forest management is a holistic process that is to be administered on the basis of scientific, ecological, economic and democratic principles.

Canada's approach to sustainable forest management focuses on six core criteria areas. These are: (1) bio-diversity; (2) eco-system condition and productivity; (3) soil and water; (4) role in global ecological cycles; (5) economic and social benefits; and (6) society's responsibility. Below each of these criteria are a series of indicators and sub-indicators that are tracked over time.⁵⁵

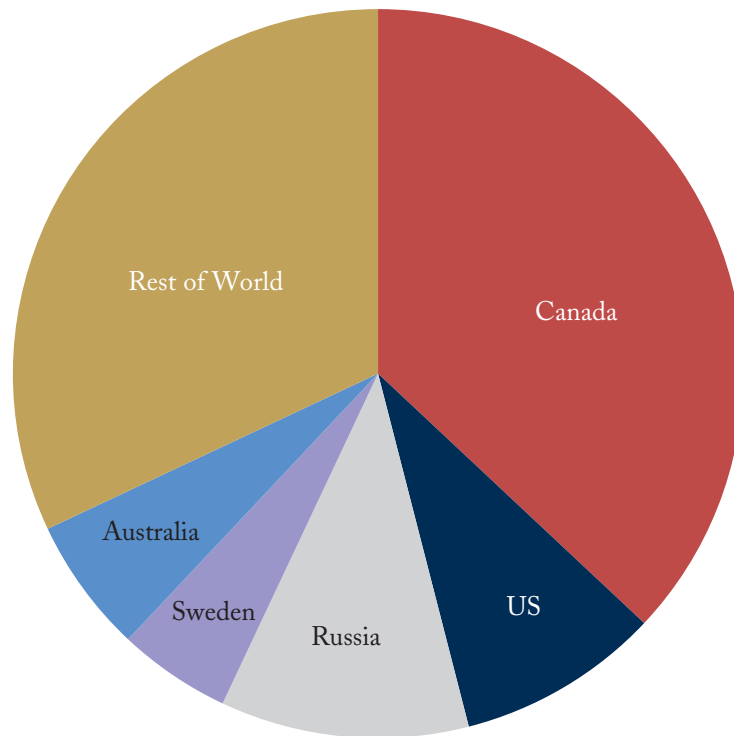
There are three major forest certification systems in Canada. Two of them – the Canadian Standards Association and the Forest Stewardship Council – are endorsed by the international Programme for the Endorsement of Forest Certification Schemes (PEFC). The third certifying entity, the Forest Stewardship Council Canada, operates four “Regional Forest Certification Standards,” which are endorsed by FSC International. Almost half of

52 For a description of the Canadian model, please see *Canada: The most experienced country in sustainable forest management!*, which was prepared by the European Union Forest Industries Association in 2012. <http://forestindustries.eu/content/canada-most-experienced-country-sustainable-forest-management>.

53 The three main sustainable forest management bodies are: Forest Stewardship Council (FSC) – <https://ca.fsc.org/en-ca>; Sustainable Forestry Initiative – <https://www.sfioprogram.org/>; and the Canadian Standards Association's Sustainable Forest Management Standard – <https://www.csasfinforests.ca/foreststandards.htm>.

54 *Sustainable forest management in Canada*. Natural Resources Canada. <https://www.nrcan.gc.ca/forests/canada/sustainable-forest-management/13183>.

55 *Criteria and Indicators Framework 2005*. <http://cfs.nrcan.gc.ca/pubwarehouse/pdfs/32560.pdf>.

Figure 1: Canada – World Leader in Share of Forests Certified as Sustainable

Source: Natural Resources Canada.

the world's PEFC certified forests and one-third of its FSC certified forests are in Canada.

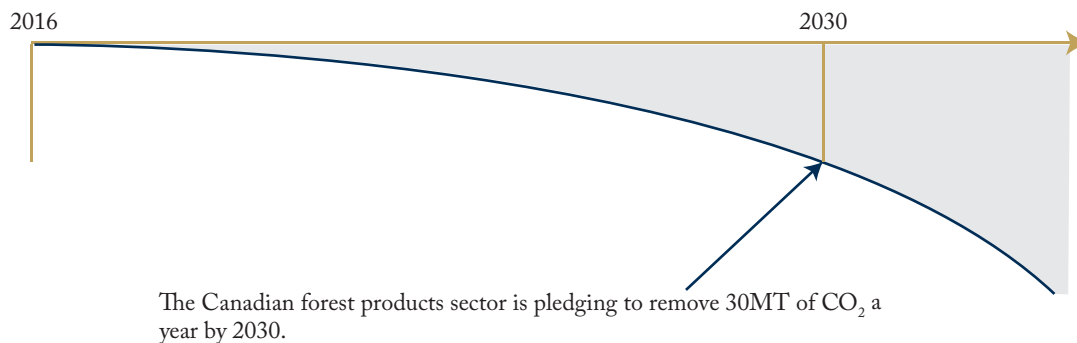
Since the 1992 UN Conference on Environment and Development in Rio de Janeiro (also known as the Earth Summit), following which the Canadian Council of Forest Ministers endorsed the national adoption of sustainable forest management principles, Canada's forest products industry – as much as governments – has been a driver of the movement toward sustainable forest practices. At a basic level, Canada mandates by law that all forests harvested on public land must be regenerated. Each province and territory has its own regeneration standards and regulations, including species composition, density and distribution across the landscape. More than half of the regeneration

in Canada is from planting and seeding, mainly by forest companies, and the rest is from natural regeneration (NRC 2019).

Given that wood stores carbon, ensuring the regeneration of forestlands while expanding the use of wood as a substitute for more carbon intensive products is crucial to Canada's climate strategy.

On the emissions front, in 2016, the forest products sector launched a historic initiative known as the "30 by 30 Climate Change Challenge." Like other parts of the economy, the forest sector needs to undergo a transition if Canada is to meet its commitments under the Paris Climate Agreement. To that end, the Forest Products Association of Canada committed to industry to reach emission reduction levels of 30 megatonnes of CO₂ per year

Figure 2: Proposed Target



Source: "Forest products industry launches "30 by 30" climate change challenge". Press release, FPAC. May 2, 2016. Available at: <http://www.fpac.ca/forest-products-industry-launches-30-by-30-climate-change-challenge/>.

by 2030. By that time, these reductions are expected to contribute 13 percent of the emissions reductions committed by Canada in the Paris Agreement.⁵⁶

The forest products industry has had a commitment to reducing greenhouse gas emissions for some time. Thanks to investments in new technologies, the pulp and paper industry, for example, has cut its greenhouse gas emissions by 66 percent since 1990.⁵⁷ This reduction and a similar drop at lumber mills is substantially attributable to shifting energy usage patterns and a surge in self-generated electricity. In fact, some 30 mills across Canada now generate green electricity from residual materials onsite.⁵⁸

The latest move on the sustainability came in October 2018 when B.C.-based TimberWest declared its commitment to become carbon neutral

over the next 10 years. Importantly, the company is measuring its total carbon footprint, which goes beyond its direct operations to incorporate its supply chain energy use, forest carbon and its distribution network.⁵⁹

Sustainability also relates to the species in Canada's forests and the eco-systems that support them. In 2017, key forest products companies partnered with Ducks Unlimited Canada (DUC) on the *Forest Management and Wetland Stewardship Initiative*.⁶⁰ The initiative has brought DUC and the forest products sector together to share information and work collaboratively on conserving wetlands and waterfowl in forest management planning and operations.

Canada's forest products industry has been consistently working to reduce its environmental

56 "30 by 30" Climate Change Challenge. Forest Products Association of Canada. 2016. <http://www.fpac.ca/sustainable-forestry/30by30/>.

57 *Ibid.*

58 *Ibid.*

59 "TimberWest pledges carbon neutrality." *Wood Business*. October 11, 2018. <https://www.woodbusiness.ca/harvesting/logging-profiles/timberwest-pledges-carbon-neutrality-5224>.

60 The key partners in the initiative include Ducks Unlimited Canada, Alberta-Pacific, Canfor, Forest Products Association of Canada, Millar Western, Tolko, West Fraser and Weyhaeuser. <http://www.cif-ifc.org/wp-content/uploads/2018/10/3-Bev-Gringas-FMWSI-DUC-CIF-conference-2018-Final-Sept-10.pdf>.

footprint and enhance its contribution to sustainability. While not every initiative yields equal results, the willingness to work with a wide range of partners on innovative and constructive initiatives is now baked into the forest products industry's DNA.⁶¹ When managing sustainability commitments, forest products companies are employing the latest technology: from LIDAR to drones to remote sensing. The information these systems generate is useful to companies both measuring their own environmental footprint and those trying to ensure proper management of ecosystems as a whole.

Ultimately, the Canadian forestry sector and all of the innovative products it produces have, at their core, a common ethos: that sustainability is good for the country, good for the company and good business. When the Forest Products Association of Canada, the main industry group, asked Leger Research Intelligence Group to assess the market acceptance of Canadian forest products around the world, it found that "Canada is perceived as the best supplier of forest products in terms of environmental practices and reputation."⁶² Developing further ways to take advantage of this premium position continues to be important.

Questions for Environmental Policy

On the whole, Canada has done remarkably well over the past 25 years on the environmental front in the area of forestry. Federal and provincial governments, forestry companies, research institutes and others have been effective partners in facing these challenges. The key question, of course, is: what can Canada do better in the years ahead and

what are the optimal policy instruments for getting there?

Allow Forestry to Make a Maximum Contribution to the Fight against Climate Change by Building Consensus around Putting a Price on Carbon

The Pan-Canadian Framework on Clean Growth and Climate Change, which was approved by the federal, territorial and most provincial governments, proposed to put a price on carbon. While different provinces approached this differently, taken together, they provided mechanisms for curtailing Canada's emissions. British Columbia has had a carbon tax for a decade while Quebec has applied a cap-and-trade scheme. Putting a price on carbon has brought to the fore the unique role of forests in Canada's climate strategy. As noted, wood retains carbon – a characteristic that becomes particularly valuable when carbon is no longer "free." As a consequence, investment in new or enhanced applications of wood becomes much more attractive. Some even argue that a price on carbon will allow renewable sectors such as the wood pellets and other biomass products to obtain a more secure and predictable market position.⁶³

Yet, Ottawa and a growing number of provinces seem to be on a collision course over carbon pricing. For example, the newly elected government of Ontario scrapped the province's cap and trade scheme in July 2018. Manitoba has just backed away from imposing a carbon tax. Saskatchewan remains unalterably opposed. The federal government has nonetheless passed legislation to impose a federal "backstop" carbon tax on those provinces that do not set one themselves,

61 To get a sense of how this looks over time, it is worth reviewing the annual "Sustainability Reports" that most of the large forest products companies produce. For a representative sample, see Canfor's reports going back to 2001 at: <https://www.canfor.com/responsibility/sustainabilityreports>.

62 See *Customer Market Acceptance Research*. http://www.fpac.ca/wp-content/uploads/Leger_Summary_V5.pdf.

63 Ron Kotrba. "Awaiting the signal." *Biomass Magazine*. March 19, 2018. <http://biomassmagazine.com/articles/15147/awaiting-the-signal>.

or an equivalent scheme.⁶⁴ The constitutionality of this legislation is now subject to various court challenges. Saskatchewan, for example, plans to appeal a recent court decision in Ottawa's favor.

Working to re-build a consensus on achieving a reduction of carbon in the atmosphere, including through an enhanced use of wood products and the strengthening of forest management, will be a long, but necessary process.

Invest Carbon Tax Revenues in Innovative Forestry

Sound public policy considers a variety of factors in its design and implementation. The federal government is intent on implementing a framework that would put a price on carbon. To make the tax politically more palatable, Ottawa seems intent on returning the taxes raised on fuels via the federal carbon backstop to individuals in the provinces where tax revenues are collected. A key part of other carbon revenues should be used to advance innovation on parts of the economy that can move the needle on the carbon front. Forestry is an essential part of this equation. Ottawa should therefore work with the industry to establish a window into which some of the carbon tax revenues would be placed for reinvestment in Canada's forests and their sustainable management. Under the Low Carbon Economy Fund, \$500 million has been set aside for challenges.⁶⁵ Given the essential role that wood plays in the fight against climate change, and the federal government should consider prioritizing local solutions to forest management, adaptation and resilience. Consequently, a commensurate share of these resources should be allocated to a separate Forest Futures Fund.

Use a Competition Model to Drive Innovation in Forest Sustainability Technology

With Canada's vast landmass, monitoring the health of forests can be a complex undertaking. The use of LIDAR, GIS, drones and remote sensors have helped significantly in the quest to better understand the workings of these complex ecosystems. The key question is how to take that to the next level. As part of its digital innovation cluster, Canada should support the development of the next home-grown generation of this technology, which can be used to gain a more precise understanding how forests work, to assess the health of these ecosystems and to develop more precise methodologies for understanding how forests contribute to a reduction of carbon in the atmosphere.

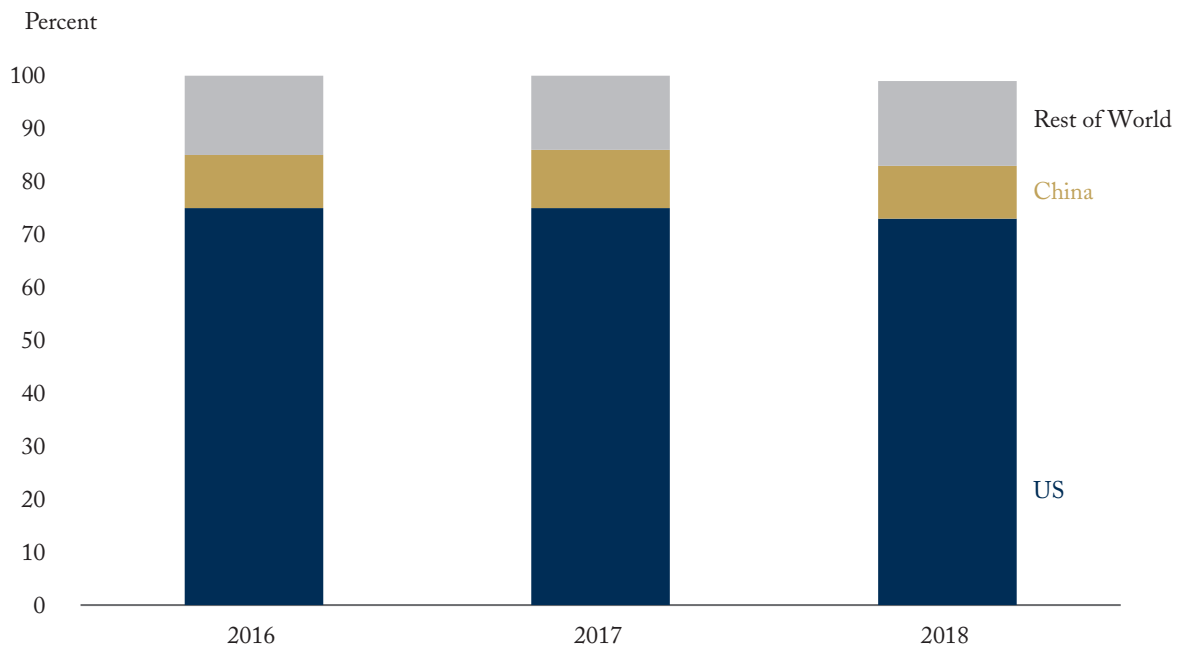
Develop a "carbon lens" When Considering Government Procurement and Infrastructure Spending

One of the key lessons of the past 25 years from the forest products sector is that one must holistically assess one's carbon footprint in order to reduce it in one's operations. The federal government should do the same. Where there are opportunities to reduce the carbon footprint of these projects through the employment of wood-based substitutes, they should be pursued. Such a lens would provide great opportunities for Canadian products and producers while advancing the public good of reducing Canada's carbon footprint. Construction and energy generation are but a few examples of sectors where such a holistic initiative could have a beneficial impact both on Canada's industrial development and on its environmental performance.

64 Mia Rabson. "Trudeau government defends carbon tax plan as provinces push back." *The Globe and Mail*. October 9, 2018. <https://www.theglobeandmail.com/politics/article-trudeau-defends-carbon-tax-plan-as-provinces-push-back/>.

65 *The Low Carbon Economy Fund*. <https://www.canada.ca/en/environment-climate-change/services/climate-change/low-carbon-economy-fund.html>.

Figure 3: Canadian Softwood Lumber Exports to the United States, China and the Rest of the World – 2016-2018*



*Trade Data Online. <https://www.ic.gc.ca/eic/site/tdo-dcd.nsf/eng/Home>.

Source: Trade Data Online.

INTERNATIONAL TRADE

Almost from the beginning of European settlements in what would become Canada, the land has supported an export-oriented forest sector. The United States imposed its first tariff (set at 5 percent) on Canadian softwood lumber imports in 1789, after Massachusetts timber barons successfully petitioned Congress for trade protection. There were US tariffs on Canadian lumber in the 1930s. Yet, the modern epoch of Canada-US lumber relations started in 1982 with the initiation of the first of what has now become five rounds of investigation,

countervailing duties, and litigation under US and international trade rules.

The United States Government has been steadily focused on trying to limit Canadian softwood lumber imports precisely because Canada represents virtually all softwood imports. While this is supposed to help domestic producers, by raising prices through constraining imports, the US policy has fueled market volatility. When the grace period for the softwood lumber agreement expired in October 2016, the futures price per 1,000 feet of board averaged \$300. This rose steadily until May 2018, when prices peaked at \$639 per 1,000 feet of

Table 1: Canada's Position in Global Forest Products Markets*

Product	Canada's World Rank for Production (2016, by quantity)	Canada's World Rank for Apparent Consumption (2016, by quantity)	Canada's World Rank for Exports (2017, by value)	Canada's Top Export Markets (2017, by value)
Softwood lumber	2	4	1	United States, China, Japan
Northern bleached softwood kraft market pulp	1	7	1	China, United States, Japan
Packaging	17	17	7	United States, China, Italy
Printing and writing paper	8	12	8	United States, Mexico, Germany
Newsprint	1	15	1	United States, India, Brazil
Oriented strand board	2	2	1	United States, Japan, China
Plywood	9	4	7	United States, United Kingdom, Australia
Household and sanitary paper	11	11	6	United States, United Kingdom, Turkey
Logs (industrial)	4	4	2	China, Japan, South Korea
Dissolving pulp	5	14	4	India, Indonesia, China
Wood pellets	2	16	2	United Kingdom, United States, Japan
Hardwood lumber	12	9	4	United States, China, Japan
Recovered paper	16	28	8	China, United States, South Korea

* Forest Fact Book: 2018-2019. Natural Resources Canada. http://publications.gc.ca/collections/collection_2019/rncan-nrcan/Fo1-17-2019-eng.pdf.

Source: Author's compilation.

board. Prices have then fallen to average \$343 by April 2019.⁶⁶

By value, Canada is the fourth largest exporter of forest products in the world. Softwood lumber and wood pulp have significant shares of the Canadian forestry mix. (NRC 2019). Canada presently exports softwood lumber to 140 countries. Even with the tariffs, the United States remains the dominant market for Canadian softwood lumber, especially for producers in eastern Canada.

Because, as noted above, the US is incapable of supplying all of the lumber it consumes, US lumber tariffs have gone directly into the cost of home construction, repairs and re-modelling.⁶⁷ While the US pursues a policy regime that benefits its lumber producers over its builders and its citizens, it is imperative that Canada re-double its efforts to further expand trade opportunities for its forest products beyond the United States.

With the onset of the fourth round of softwood lumber litigation (Lumber IV) in 2002, the Canadian federal and provincial governments began to work on export diversification, an effort that was further accelerated with the crash of the US housing market in 2008-09. In 2002, the federal government established funding programs to help Canadian wood products associations diversify and expand export opportunities for their products in traditional and emerging overseas markets and also domestically within Canada; these activities were

later combined to form the Expanding Market Opportunities Program that is active to this day.

Sitting on the Pacific Ocean, it was cost effective for coastal and, increasingly, interior producers in British Columbia to export to Asia. With the support of federal and provincial governments, over time the Canadian forest industry opened market development offices in Shanghai, Beijing, Tokyo and Seoul under the “Canada Wood Group” umbrella. These offices conduct a range of activities such as training and education, branding initiatives, demonstration projects, quality support, and technology transfer.

The impact of these activities is best felt in China. In 2017, Canadian wood products exports to China totalled \$1.7 billion - wood product exports to China have grown 29-fold since 2002. According to the B.C. Council of Forest Industries (COFI), China now takes 24 percent of the provinces total forest products exports⁶⁸ and 21 percent of its softwood lumber exports.⁶⁹ China has also acquired a hugely important position for Canadian pulp exports, accounting for 44 percent by value of the nation’s exports in this segment.⁷⁰

Canada’s softwood lumber exports to China dropped marginally in 2018.⁷¹ Yet, the Chinese lumber market has continued to expand. Russia – a low cost producer with vast forests – sent record volumes to China. In fact, it has increased its share of the Chinese market from 36 percent in 2011 to 56

66 See “Lumber Futures Historical Data.” *Investing.com*. <https://www.investing.com/commodities/lumber-historical-data>. Also see Caitlan McCabe. “Did Trump’s lumber tariffs make your new house more expensive?”. *Philadelphia Inquirer*. October 17, 2018. https://www.philly.com/philly/business/real_estate/residential/lumber-tariff-trump-canada-softwood-forest-housing-price-affordability-costs-20181017.html.

67 Peter Eavis. “How Trump’s Lumber Tariffs May Have Helped Increase Home Prices.” *New York Times*. June 11, 2018. <https://www.nytimes.com/2018/06/11/business/dealbook/trump-tariffs-canada-lumber.html>.

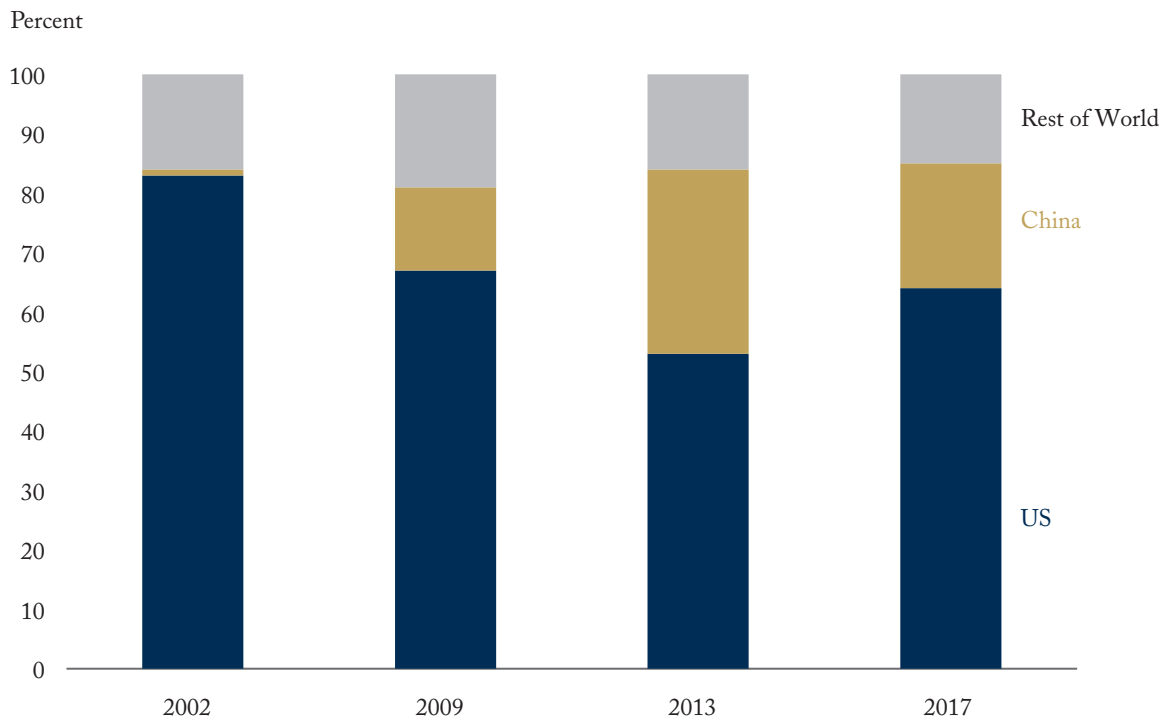
68 *Forest Products for the World*. COFI. <https://www.cofi.org/forest-products-for-the-world/>.

69 *Wood products and services from B.C. are in demand around the world. Learn about key international markets and the export opportunities for the forestry sector*. Trade and Invest British Columbia. <https://www.britishcolumbia.ca/export/industry-sectors/forestry/>.

70 *Forest Fact Book: 2018-2019*. Natural Resources Canada. http://publications.gc.ca/collections/collection_2019/rncan-nrcan/Fo1-17-2019-eng.pdf.

71 Dalheim, 2018

Figure 4: B.C. Softwood Lumber Exports to the United States, China and the Rest of the World – 2002-2017 (Exports by Quantity measured in Cubic Meters)*



* Softwood Lumber Exports. BC Stats. <https://www2.gov.bc.ca/gov/content/data/statistics/business-industry-trade/trade/trade-data>.

Source: BC Stats.

percent in 2018, making it a formidable challenger to Canada.⁷² Recent political developments between Canada and China also risk creating spillover effects into the bilateral lumber trade.

Japan is the now the third largest export market for Canadian forest products. Like China, B.C. is a natural supplier to Japan. According to the B.C. Council of Forest Industries, it took 9 percent of the province's lumber exports.⁷³ In the softwood lumber category, accounted for 11 percent of B.C.'s exports in 2017.

There are greater opportunities for these exports to grow even further as supply chains for furniture and other high value wooden products shift out of China to parts of Southeast Asia. For example, Vietnam is projected to see its wood and furniture exports grow to US\$10 billion per year by 2020, up from just US\$3.7 billion in 2011.⁷⁴ Anecdotal evidence suggests that the importation of key North American varieties of wood is already surging in Vietnam. With the Comprehensive and Progressive Trans-Pacific Partnership now in force, Vietnam's

⁷² *Ibid.*

⁷³ COFI.

⁷⁴ <https://www.statista.com/statistics/828456/vietnam-wood-and-furniture-export/>.

imports of Canadian forest products that, in turn, undergo further processing into furniture and other products for export, are expected to surge.

It is notable that from 2015 onwards, despite the strongest US growth in two decades, the US share of the export market for B.C. softwood lumber does not even exceed two-thirds of total exports. While in absolute terms, the US remains an incredibly important market, over the medium term, one can realistically see its share shrinking to a steady state of about 50 percent of B.C.'s total softwood export market.

One pernicious problem in the international trading system today is the trade of illegally harvested timber. While illegal logging is a global problem, very little illicit cutting and selling of wood takes place in Canada. Nevertheless, companies and downstream users of biomass must work with the federal government to guard against the introduction of "illegal wood," whether from foreign or domestic sources, into Canadian supply chains. It is in Canada's interests to work to strengthen the monitoring and traceability mechanisms for the trade in wood products. After all, such actions would support the environment and remove unfair competitors from the market.

Questions for Trade Policy

The forest products sector is a key part of the answer to the federal government's quest to diversify exports. The forest products sector is now the largest Canadian exporter (by value) to China. As noted above, this was not always the case. This is a concrete success story from past diversification efforts and highlights the role that forestry can play

in achieving this key Canadian policy objective in the future.

Find a Path Forward on US Softwood Lumber

Trade disputes are easy to start and hard to end. "Lumber IV" (2002-2006), the fourth cycle of softwood trade dispute since 1982, ended through a negotiated settlement that was facilitated by a distribution of the duties paid into escrow during the period of the dispute. Specifically, Canadian exporters received back 80 percent of the money paid into escrow.⁷⁵ With the Canada-US-Mexico Agreement (CUSMA) now concluded and a substantial amount of duties already paid into escrow,⁷⁶ it is time for policymakers in Ottawa as well as the industry to start developing creative solutions for ending this dispute over the medium term. While the 2006 Agreement financially rewarded the US Lumber Coalition members, it also bought peace and predictability for Canadian exporters for a decade. It may be time to explore whether a similar arrangement with the US government and industry would be of interest at this juncture. This would be done concurrent with stepped up advocacy by Canadian entities with home builders and other key users of softwood lumber.

Develop a Sectoral Arrangement for Trade in Forest Products with China

CUSMA Article 32.10 was designed by the United States to provide strong disincentives for Canada and Mexico to negotiate a free trade agreement with China. Under the most optimistic circumstances, a full free trade agreement with

75 *Softwood Lumber Agreement* (2006). Available at: <https://ustr.gov/sites/default/files/uploads/factsheets/Trade%20Topics/enforcement/softwood%20lumber/2006%20U.S.-Canada%20Softwood%20Lumber%20Agreement.pdf>.

76 Take the case of West Fraser, which reported in its First Quarter 2019 results that it had export duties paid or payable on deposit of US\$201 million for countervailing duties and \$75 million for anti-dumping duties for a total of US\$276 million since softwood lumber duties were imposed in 2017. <https://www.westfraser.com/investors/news/news-releases/west-fraser-announces-2019-first-quarter-results>.

China would take years. Article 32.10 coupled with recent political developments, and despite repeated Canadian protestations of policy sovereignty, makes a bilateral free trade agreement now seem like a remote possibility. The real question is what to do in the meantime. In the absence of a comprehensive trade agreement, one possibility is to pursue a sector-by-sector approach that is politically acceptable and mutually beneficial to Canadians and Chinese. Among the wide range of sectors of interest to the Canadian economy, the forest products sector is one that warrants continuous bilateral government and commercial engagements.⁷⁷ If trade talks were to resume, one could envision a “framework of engagement and cooperation” that includes a strong forest products trade component – perhaps even specific export targets – but also a model of collaboration on sustainable forest management and other priorities.

The two governments have enjoyed long and fruitful cooperation in the wood and wood construction sector. In 2012, with the help of Canada Wood Group, Natural Resources Canada signed a Memorandum of Understanding (MOU) with its Chinese counterpart, the Ministry of Housing and Urban-Rural Development, to cooperate in the development of eco-cities; this MoU was renewed in 2017 and remains active. The 2017 Canada-China Leaders Joint Statement on Climate Change and Clean Growth also underlined government support to establish new Sino-Canadian eco-districts and tall wood structures using Canadian wood products. Most recently, the first Canada-China Economic and Financial

Strategic Dialogue, which took place in November 2018, highlighted the two countries’ commitment in cooperate in the application of sustainable technologies and products to address climate change.

Undertake a Domestic Trade Facilitation Audit for the Forest Products Sector

If one wants to be a great trading nation, one needs to have the right legal, regulatory and physical infrastructure in place to facilitate it. The industry and government should appoint a third party auditor to examine Canada’s regime for facilitating exports of forest products to the world and make recommendations on how to improve it. The Jenkins Panel on Innovation (2011) and, especially, the Emerson Panel on Canada’s transportation system (2016) offered important recommendations. They did not, however, focus much on forestry. In B.C., it is uncommon for export logs to be transported more than a few hundred kilometers to the coast or to a major saw mill (Dumont and Wright 2006). The economics are simply not there to support it. This transportation-imposed limitation means that most of the B.C. logs exported to Asia come from near the coast. The audit could examine how to reduce transportation costs for the purpose of increasing the export catchment area. Similarly, this audit would examine how to make eastern Canadian lumber economical and more attractive in the European and Middle Eastern markets. Transport and trade facilitation are key parts of this equation.

77 Sectoral agreements were the key recommendation of the Public Policy Forum’s major 2018 report *Diversification Not Dependence: A Made-in-Canada China Strategy*. <https://ppforum.ca/wp-content/uploads/2018/10/DiversificationNotDependence-PPF-OCT2018-EN.pdf>. In November 2018, a ministerial delegation to China pursued discussions on a sector-by-sector approach with China. See Nathan Vanderklippe. “Ottawa shifts gears, now seeks smaller sectoral trade deals with China.” *The Globe and Mail*. November 9, 2018. <https://www.theglobeandmail.com/business/article-ottawa-shifts-gears-now-seeks-smaller-sectoral-trade-deals-with-china/>. Forestry was not on the list of four sectors of focus, but, given the volumes of Canadian exports to China in this sector, it should have been.

Explore Ways to Brand Canadian Lumber Products

Almost every product is branded. A potential solution to dealing with the problem of cheap Russian lumber in the Chinese and other markets is to explore how to brand Canadian lumber with clients and end consumers. Some combination of “certified, sustainable, ethical and legal lumber” sounds better than “lumber.” A first step would be to explore how other commodities have been branded and to whom they are targeted. The process of branding would not be limited to logs or standard-length lumber (2x4s and their metric counterparts). It also would focus on wood and wood-containing products. The Leger Survey note in the Environment section above found that Canadian lumber has a very positive reputation for quality and sustainability. Now it is time to turn this positive perception into market advantage.

Utilization of Trade Agreements

A central Canadian strategy for trade diversification has been the negotiation of free trade agreements. While free trade agreements provide important basic access, they are too often under-utilized by the companies they are meant to benefit. Some countries, notably Korea, have proven very successful in significantly enhancing free trade agreement utilization. This has been done through drawing on networks, market intelligence and seamlessly marrying up companies with trade finance and promotion resources. The Canadian government should consider working with the Canadian forest products sector, with its vast supply chain, to develop and execute a robust methodology for better utilizing the Canada-European Union Comprehensive Economic and Trade Agreement (CETA), Korea, Israel and CPTPP.

CONCLUSION

The Canadian forest products industry has a long history and, with the right policies behind it, a bright future. Ultimately, the key to the industry’s success is to stay true to Canadian models and methodologies. Canadian researchers in forestry, whether in public or private institutions, are pioneering new products and ideas on a continuous basis. An ongoing refinement of the important partnerships that turn ideas into products and services is essential.

Canada also has shown significant leadership on the sustainability front and in the fight against climate change. By placing sustainability at the forefront, companies are achieving positive environmental, business and branding outcomes.

Finally, on international trade, there is a world of opportunity. Different patterns of production and consumption, whether a rising furniture sector in Vietnam or the emerging use of Canadian-developed corrosive resistant alloys in Europe, are pushing for a constant reassessment of where to focus resources. Yes, there are low-cost producers that challenge Canada’s market position in certain locations. The key is to find ways to compete in these and other markets. A re-imaged relationship with federal and provincial export promotion resources would be helpful.

Canada’s forest products sector is integral to Canada’s economy as a whole and to the hundreds of lumber towns across the country it supports. Supporting and removing barriers to innovation and growth will allow Canada to better build on this great area of comparative advantage, making the forest products industry a bedrock for the next great era of Canadian prosperity, as it has been in the past.

REFERENCES

- Canadian Council of Forest Ministers. 2017. "A Forest Bioeconomy Framework for Canada." Available at: <https://www.ccfm.org/pdf/10a%20Document%20-%20Forest%20Bioeconomy%20Framework%20for%20Canada%20-%20E.pdf>.
- Council of Canadian Academies. 2013. "The State of Industrial R&D in Canada: The Expert Panel on the State of Industrial R&D in Canada. Available at: http://www.scienceadvice.ca/uploads/eng/assessments%20and%20publications%20and%20news%20releases/research%20and%20develop/ird_fullreporten.pdf.
- Cockwell, Malcolm. 2012. "The Forests of Canada: A Study of the Canadian Forestry Sector and Its Position in the Global Timber Trade." Limberlost Forest & Wildlife Reserve.
- Dumont, Bill, and Don Wright. 2006. "Generating More Wealth from British Columbia's Timber." Report for the B.C. Minister of Forests and Range. December. Available at: <https://www.for.gov.bc.ca/ftp/het/external/publish/web/exports/generating-more-wealth.pdf>.
- Finish Forest Association. "Forest Ownership." Available at: <https://smy.fi/en/forest-fi/forest-facts/finnish-forests-owned-by-finns/>.
- _____. "The Swedish Forestry Model." Available at: <http://www.ksla.se/wp-content/uploads/2010/10/The-Swedish-Forestry-Model.pdf>.
- Forest Products Association of Canada. 2016. "30 by 30' Climate Change Challenge." Available at: <http://www.fpac.ca/sustainable-forestry/30by30/>.
- _____. "Economic Backbone Map." Available at: <http://www.fpac.ca/canadian-forestry-industry/economy/>.
- FPIInnovations. 2017-2018 Annual Report. Available at: <https://fpinnovations.ca/media/Documents/annual-reports-and-reviews-of-activities/2017-2018-annual-report.PDF>. <https://fpinnovations.ca/ResearchProgram/advanced-building-systems/Pages/promo-tall-wood-buildings.aspx>.
- Government of Canada. 2016. "Pan Canadian Framework on Clean Growth and Climate Change." Available at: <https://www.canada.ca/en/services/environment/weather/climatechange/pan-canadian-framework/climate-change-plan.html>.
- _____. 2017. "Greening Government Strategy." Available at: <https://www.canada.ca/en/treasury-board-secretariat/services/innovation/greening-government/strategy.html>.
- House of Commons. 2018. "Value-Added Products in Canada's Forest Products Sector: Cultivating Innovation for a Competitive Bio-Economy." Report of the Standing Committee on Natural Resources. May.
- Innis, Harold. 1930. *The Fur Trade in Canada*. Yale University Press.
- Mazzucato, Mariana. 2018. *The Value of Everything: Making and Taking in the Global Economy*. New York: Hachette.
- Natural Resources Canada. 2018. "The State of Canada's Forests: Annual Report 2017." Available at: <http://cfs.nrcan.gc.ca/pubwarehouse/pdfs/38871.pdf>.
- _____. 2019. "The State of Canada's Forests 2018 Report." Available at: <https://www.nrcan.gc.ca/forests/report/16496>.
- _____. "Investments in Forest Industry Transformation: Performance Report – 2015-2016." Available at: <http://cfs.nrcan.gc.ca/pubwarehouse/pdfs/38854.pdf>.



Public Policy Forum. 2018. "Diversification Not Dependence: A Made-in-Canada China Strategy."

United Nations Conference on Environment and Development (UNCED). 1992. "Forest Principles." Available at: <https://www.un.org/documents/ga/conf151/aconf15126-3annex3.htm>.

United Nations, Food and Agriculture Organization. "United States of America: Forests and forestry sector." Available at: <http://www.fao.org/forestry/country/57478/en/usa/>.

United Nations, Food and Agriculture Organization. FAOStat. "Forestry Production and Trade." Available at: <http://www.fao.org/faostat/en/#data/FO>.

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