

Canadian Politics and Public Policy

# Policy

Forestry for  
the Future



The background of the entire page is a stylized landscape. The top half features a sky with soft, horizontal bands of light green and yellow. Below the sky are rolling hills in shades of light green and yellow. The bottom half of the image is dominated by a dense forest of dark green, coniferous trees. The text is overlaid on the left side of this landscape.

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# Policy

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Public Policy

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# Forestry for the Future

By David Graham and Derek Nighbor

Welcome to our Forest Products Association of Canada-*Policy Magazine* special issue, offering a selection of fresh insight and intelligence from Canada's forest sector.

Today, the future of the forest sector and its more than 200,000 workers depends on the success of our ongoing commitment to innovation and sustainable development in every area of our business.

As was tragically evident from the recent personal, physical and economic devastation in Jasper, Alberta, we must better work with our forests and forested communities to mitigate the risk of more catastrophic wildfire patterns.

Canada is among the best stewards in the world in how we sustainably manage our forests for multiple values; and the work of Canada's foresters is constantly evolving as forest health and the safety of Canadians living in forested communities is challenged by a range of factors, from worsening pest and fire outbreaks to inadequate and outdated policy.

In this dedicated, special edition of *Policy*, we've assembled top experts in their fields for their views on what forestry can – and should – look like in Canada in the years ahead.

For this journey from the forest floor right into the future, Dr. Jen Beverly of the University of Alberta starts with how government needs to create conditions for more effective ways to anticipate and manage wildfire in the years ahead.

While the severity of the impact of wildfires remains uncertain, Bryce Jones and Angelique Ahlström of Flash Forest speak to the need for policy decisions on adopting technology to help this new era. John Desjar-

lais, Executive Director of Indigenous Resource Network, reminds us that unique and innovative solutions can be found in Indigenous-led forestry practices.

Dr. Jamie Stephen, Managing Director of Torchlight Bioresources, explains how trees can help meet climate goals while still growing our resource-dependent economy and meeting the energy needs of our global customers.

In *Forestry in The Digital Age*, forestry tech experts Tom Grabowski and Alex Bilyk warn decision makers that while technology is a game-changer, there's still no substitute for experience.

This modern era of forestry needs permanent shifts to achieve social, environmental, and economic benefits. Steve Kozuki, Executive Director of the Forest Enhancement Society of British Columbia, shows how collaboration among an array of organizations and communities produced stronger and deeper partnerships for climate-smart forestry.

If the Eiffel Tower were built today, it would be made of wood. That was the message from the 2024 Paris Olympics, which served as a showcase for the boom in mass timber structures. Bentley Allan of Johns Hopkins University and Net Zero Policy Lab, and Derek Eaton, director of Industrial Policy for the Transition Accelerator, look at how Canada's mass timber sector is scaling for a sustainable future.

Eric Miller, principal of the Rideau Potomac Strategy Group, lays out a path to affordable housing in Canada with harvested wood products and mass timber that also provide essential environmental, social, and economic benefits.

Are you an online shopper? 3M Senior Vice President and Chief Sustainability Officer Dr. Gayle Schueller explains how her company is fostering a circu-

lar economy through sustainable materials that minimize packaging waste and environmental footprints, while reconciling consumer needs and environmental impacts.

In a time of accelerated change, JP Gladu highlights the value of including Indigenous entrepreneurs and businesses in resource development plans. Founder and principal of the Indigenous bridge-building consultancy Mokwateh, Gladu writes about leadership and collaboration as the keys to creating a stronger Canadian economy.

Forest industry consultant and thought leader Dr. Alice Palmer brings us perspectives on the European Union Deforestation-free Regulation and how this well-intended initiative is creating frustration and confusion, not only in Canada but around the world.

Finally, Senior Fellow and Director of Natural Resources, Energy and Environment for the Macdonald-Laurier Institute Dr. Heather Exner-Pirot writes about how the current national policy framework is challenging Canadian forestry's ability to compete and grow.

Canada's forest sector is poised to help reduce this country's carbon emissions, support the conservation of biodiversity, mitigate the risks of more catastrophic wildfires, and grow a greener and more innovative economy.

Now more than ever, we need the federal government's commitment to improving policy coherence so the sector and its workers can achieve our full potential.

*David Graham is board chair of Forest Products Association of Canada and president of Weyerhaeuser Company Limited.*

*Derek Nighbor is president and CEO of the Forest Products Association of Canada.*



*'There is no one-size-fits-all approach to mitigating wildfire risk across Canada's diverse landscape,' writes wildfire expert Jennifer Beverly.*

# Rethinking Fire Risk and Forest Management

**By Dr. Jennifer L. Beverly**

Canada's severe 2023 fire season motivated many to pause and re-evaluate our understanding of wildfire risk, its underlying drivers, and the actions needed to ensure healthy and resilient socio-ecological systems into the future. In 2023, the area burned by wildfires in Canada was roughly 15 to 17 million hectares, presenting as a distinct outlier (Fig. 1).

Extreme fluctuations in national burned area from year to year are not unusual. Previous extreme years burned areas exceeding six million hectares in 1981, 1989, 1994 and 1995. Notably, the area burned in 1981 was five times the average observed in preceding decades – a relative increase not dissimilar to 2023. But on an absolute basis, the scope of area burned in 2023 remains unprecedented during the past century.

Despite decades of investment in research and modeling to predict fire activity into the future, and under a warming climate, no study, no model and no wildfire expert in the country predicted wildfires could burn over 15 million hectares in

Canada in a single year – and yet, it happened. The obvious conclusion is that we should not be relying on the data, research methods, and management practices of the past to effectively anticipate and manage wildfire in the years ahead.

An entrenched legacy of fire research and fire management ideologies that support a fire suppression mandate is a major constraint in conceptualizing and addressing fire risks. The system developed in Canada to rate the risk of wildfires was designed to help fire management agencies anticipate where and when fires could ignite and what those ignited fires could do over the course of metres and hours, all based on daily ratings of fuel moisture, potential fire behaviour, and associated predictions of fire characteristics such as intensity and rate of spread.

In recent decades, increased fire activity and impacts on socio-ecological systems have shifted the emphasis away from fire suppression and towards wildfire mitigation. This has elevated fire risk from a day-to-day consideration exclusive to operational fire response staff

who manage individual fire events, to a strategic-level consideration extending several years into the future and covering large regions over which mitigation efforts must be proactively planned and implemented by a suite of decision makers with diverse perspectives and needs.

Early efforts by federal government fire researchers to supply strategic wildfire risk assessments did so by repurposing the same models that were already in place for informing fire response operations. Advances in computing technology in the early 2000s made it possible to use those existing models in ways they were never designed for. For example, complex simulations meant thousands of fires could be grown across a computer landscape to map areas that burned most often. The resulting burn probability maps were promoted as a guide for mitigation action such as fuel reduction treatments. But more recently, studies in Alberta and Alaska have shown that real fires don't tend to burn in the hotspots of these simulated burn probability maps.

Alternative approaches for informing fire risk, such as landscape fire exposure

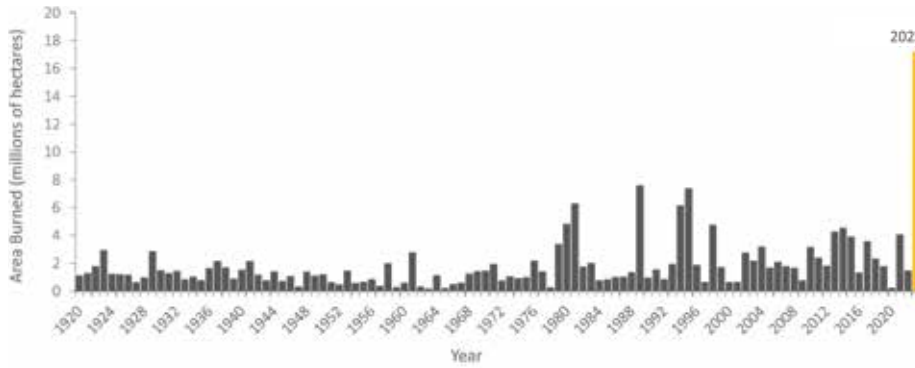


Figure 1. Annual area burned in Canada 1920–2023 (Source: National Fire Database, National Burned Area Composite, Canadian Interagency Forest Fire Centre).

assessments, show better alignment with real wildfires, but only due to a radical departure from the ideologies of the past. Instead of attempting to model all of the factors that dictate when, where and how fires burn (i.e., fuel, weather, topography and ignitions), these new assessments focus exclusively on the one thing we can know with any degree of certainty: the fuel hazard.

An emphasis on fuels alone recognizes just how unpredictable fires are over the longer decision horizons necessary for mitigation planning. Every negative fire impact is the product of a perfect storm: an ignition falls on fuels that happen to be dry and receptive to that ignition, which happens to align with a wind direction that happens to push the ignited fire towards more fuel that happens to imperil something of value. In the aftermath of such a fire, it is relatively easy to explain how that specific confluence of factors generated the observed outcome, which gives a false sense of confidence in our ability to predict and avoid these events before they happen (i.e., hindsight bias).

In reality, we cannot predict where lightning will strike across a management area nor where a spark will fly from a chainsaw somewhere in the forest; nor can we predict which way the wind will be blowing when those serendipitous ignitions happen.

This kind of deeply uncertain future means that we cannot assign fire likelihoods or probabilities with any degree of confidence. This demands alternative, non-probabilistic approaches to strategic risk assessment, such as robust decision making and futures and foresight analysis. Robust approach-

es would involve a broad exploration of the decision space in fire and forest management, while futures studies provide tools to imagine the future beyond what is probable, to include plausible futures, possible futures, and desired futures as well. Unfortunately, efforts to guide wildfire science nationally tend to define risk within a traditional likelihood-times-impact probabilistic framework that is championed by many in government.

Regardless of how fire risk is assessed, the prescription for mitigation from a forest management perspective remains unclear. Severe fires and fire seasons in Canada are routinely attributed to fuel build-up caused by decades of fire suppression and forest mismanagement. This may indeed be the case in some regions of the country, but the extent to which fuel accu-

mulation is broadly contributing to severe fire seasons across Canada's entire forested land base is unconfirmed.

Between 1986 and 2023, only about one fifth of national burned area occurred within long-term forest tenure areas (Fig. 2). Suppression of fires beyond these areas is limited throughout much of Canada's boreal zone due to the sparse population and lack of values. Within forest tenure areas, where fire suppression has occurred for an extended period, it is possible that stands that would normally experience regular, lower intensity surface fires, predominantly in British Columbia, could develop unnatural fuel loads that support more intense fires. In the vast boreal forest, where high-intensity, stand-replacing fires are perfectly natural, fire suppression is thought to disrupt the age-class mosaic, creating expansive continuous forests at an advanced development stage, potentially supporting unconstrained fire growth.

If historical fire and forest mismanagement is contributing to severe fire seasons, we would expect to see older stands burning preferentially due to presumed fuel accumulation and increased forest continuity. But in 2023, wildfires burned stands of all ages within Canada's managed forest, generally proportionate to their availability (Fig. 2, 3). There were some dispro-



Figure 2. Locations of 2023 fires and historical fires (1986–2022) in relation to Canada's forest tenure areas (i.e., long-term tenure per Stinson et al. 2019).

portionate burned areas in the very oldest forest age-class (>150 years), but that represents a small proportion (2.7%) of the area burned within long-term tenure areas last year.

Nonetheless, there have been calls to redesign forest structure and composition to cool the forest in support of wildfire resilience. Fire-smart forest management involves strategically altering forest fuels across large areas to reduce fuel continuity using harvesting, prescribed fire, lower flammability fuel types and other potential disruptions to fire spread, such as roads. Despite being introduced over 20 years ago, the assumptions of landscape-scale fuel management in Canada's forests have yet to be thoroughly verified in the real world. Climate warming further complicates our understanding of how, when, and where to effectively manage fuels across not only broad landscapes, but at targeted localized scales as well.

We must accept that there is no one-size-fits-all approach to mitigating wildfire risk across Canada's diverse landscape. Efforts to force national standards, approaches and directions are likely to

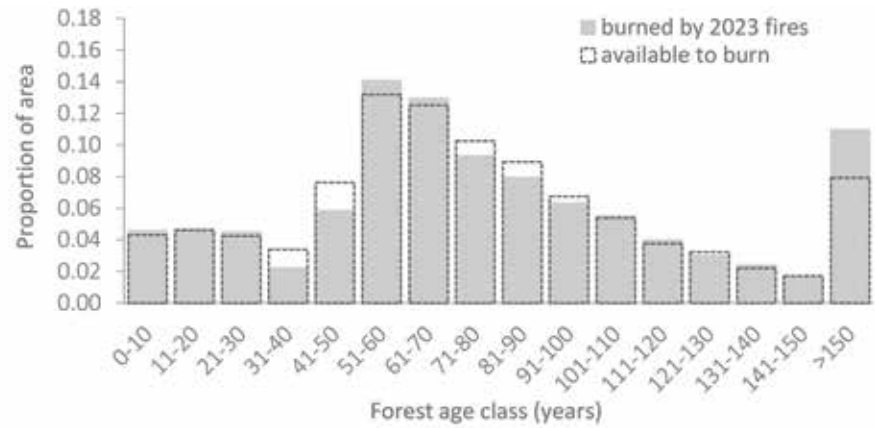


Figure 3. Forest ages burned by 2023 wildfires (gray bars) within forest tenure areas (i.e., long-term tenure per Stinson et al. 2019). Hollow dashed bars show the corresponding proportion of area available to burn. Burned areas are from the National Burned Area Composite; forest ages circa 2017 from Maltman et al. (2023).

fail, especially when focused on status quo approaches and entrenched ideologies. Wildfire mitigation can and should look very different from place to place, even within a single jurisdiction or management area. What is needed is funding to support these decentralized planning processes and commitment to remove jurisdictional and policy barriers to implementing locally planned action. Recent devastation in Jasper, Alberta, reminds us of the ever-present

wildfire threat. Imaginative approaches to a wildfire resilient future will be essential for identifying what actions are needed, uncovering vulnerabilities, cultivating innovative solutions, and guiding forest management to help build a brighter tomorrow.

*Dr. Jennifer L. Beverly is an associate professor in the Department of Renewable Resources at the University of Alberta and has been studying wildfires for more than 25 years.*

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*Flash Forest plans to plant a billion trees by drone in Canada by the end of the decade. —Flash Forest*

# Reforestation for a Changing World

**By Bryce Jones and  
Angelique Ahlström**

**F**orests respond to wildfires in ways one can't always predict, but how humans respond is paramount. Canada's boreal forest is one of Earth's four largest terrestrial carbon storehouses, yet is now experiencing record-breaking fires that compromise it. In 2023, over 17 million hectares of forest burned in Canada—six times the 10-year average—accounting for 43% of humans displaced by wildfires globally. Beyond demographic

impacts on exposed and vulnerable populations, severe wildfires hinder the lifeline of critical ecosystems that help regulate the biosphere. The future trajectory and impact severity of Canadian wildfires remain uncertain. However, the outcome will depend on a combination of factors, including fire management, approaches to nature restoration, and policy decisions on technology adoption, all of which shape how Canada adapts to the new “Pyrocene” — fire historian Stephen Pyne's term for this epoch of increased fire activity.

## **Forest Change and Reforestation**

Wildfires in a warming climate are changing the overall shape and composition of Canada's forests and reducing tree cover in areas failing to naturally recover. Black spruce, for example, show decreased recovery rates and shift their composition towards deciduous trees. After 10-16 months on the ground, their seed loses viability. If no germination occurs one year after a fire event, regeneration chances are low. More frequent fires also lead to mortality of younger stands, leaving less seed



available after fires. You can see how this feedback loop unfolds. There remains a large and increasingly unmet but crucial need to reforest severely burnt stands in Canada.

### Limits of Tree Planting

Tree planting using the traditional hand-and-shovel method is arduous, important work. The value it provides to Canada's forests and economy is significant. There are three main challenges facing traditional planting: 1) Tree planter availability, 2) Safety, and 3) Scalability.

- 1) Forestry experts have consistently communicated that it's getting increasingly difficult to source tree planters to meet the annual reforestation demand.
- 2) Tree planting is known for its physical demands and challenging conditions. Burn sites present additional challenges – including hazard trees, pointed snags, ground cavities, and carbon dust, which can sometimes make these areas legally restricted for planting. Despite these challenges, tree planting remains a vital activity for forest restoration.
- 3) Tree planters have a biological limit to scale. On average, a human plants somewhere in the order of 2,000 seedlings per day. Without technological advancements, significantly higher planting scales using traditional planting methodology can only be achieved by hiring more planters.

One existing alternative to traditional planting is known as “seed broadcasting” or “aerial seeding” (commonly mistaken for “seedpod planting” by drone), and involves the indiscriminate scattering of seeds by helicopter or plane. A requirement of 100,000 seeds per hectare is not uncommon. A key issue with this approach is that seed waste rates of 95 to 99% (due to seed misplacement, desiccation and predation) are making seed broadcasting more and more untenable.



*Traditional planting remains foundational to Canada's forestry industry (Flash Forest employee shown) —Flash Forest*

### Flash Forest

Flash Forest was co-founded in 2019. Having worked in the tree-planting industry years prior and witnessed the lack of technology available for reforestation in addition to observing the impacts of wildfires experienced in our BC backyards, the founders saw the urgent need for more advanced solutions to address large-scale forest loss in Canada. The mission of Flash Forest was set to accelerate forest restoration at scale using new technologies, with a target of one billion trees by the end of the decade.

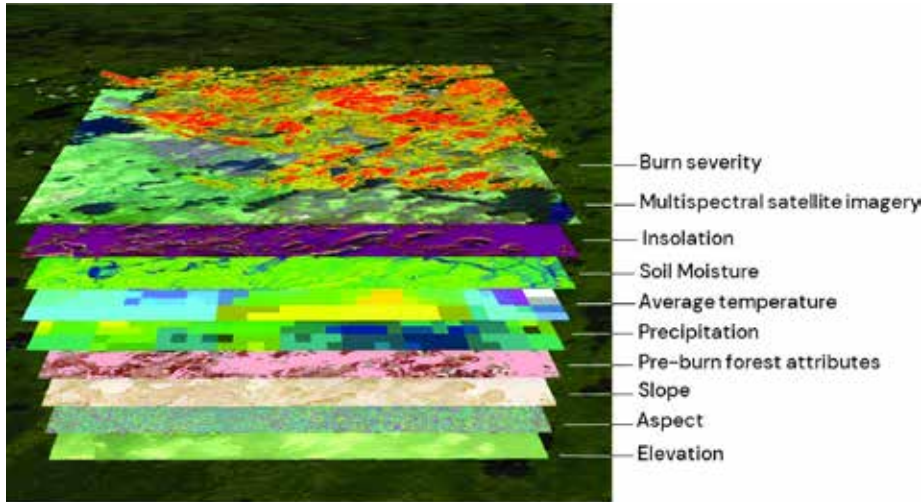
### Technological Alternative

Over the past five years, Flash Forest has been developing solutions with the intent of addressing the above concerns within Canadian forestry with a viable technological alternative. After four years of trials across Canada, the planting of millions of pods and hand-collected data on failed and successful proj-

ects, Flash Forest recognizes that (1) site-selection and (2) species-selection remain two of the most crucial drivers of a successful reforestation/afforestation effort. Land conversion from wildfires and drought is also altering the species-mix required for long-term survival of forests. As of this year, Flash Forest has built a deep-learning model which takes historical germination and survival data from our planting efforts and correlates it with environmental and climatic factors to predict suitability for our approach.

Within Flash Forest's tech suite, these are the primary innovations brought to our projects: 1) Biodegradable Seedpod Technology, 2) Seedpod Embedment, 3) Manufacturing Automation and 4) AI Software models for site selection.

- 1) Seedpods contain a combination of bioavailable nutrients, minerals and a symbiotic microbiome (19 mycorrhizal and 2 bacterial inoculants), promoting several key



Flash Forest's AI model assesses site selection factors for drone reforestation.

- benefits, including germination and survival improvements, and reduction of seed waste from desiccation and predation. Designed to support seedling growth during periods of heat and drought, upon first contact with rain, the seedpods expand to approximately 400% in volume, increasing the water holding capacity of the microsite that envelops the seedling.
- 2) Rather than planting seedlings by hand or scattering seeds, Flash Forest mechanically 'embeds' seedpods into soils using payload systems mounted to UAVs. The hard protective shell of the seedpods enables soil penetration and shields seeds from predation.
  - 3) Flash Forest's seedpod production facilities, based out of Mississauga, Ontario, have achieved substantial efficiencies at scale, where currently 450,000 seedpods are produced per day. Daily throughput is expected to reach one million seeded pods per day by Q4 2024. Flash Forest's six-month seedpod production value chain allows for quick response time to wildfire disturbances. It also allows for the nursery phase to be bypassed, requiring less water, space and energy, which reduces GHG emissions over the convention.
  - 4) Flash Forest's site suitability AI (deep learning) model, using real-time satellite imagery, analyzes en-

vironmental indexes (e.g. solar radiation, soil moisture, mean summer precipitation, etc.) that allow for selections of regions with the highest probability of planting success. This list of environmental and climatic factors has been exhaustively collected and modeled alongside Flash Forest's planting data to allow for macro and micro-site targeting. Flight path generation models trained on AI help optimize flight routes to maximize survival and species selection, while minimizing seedpod wastage on areas that are not mineral soil (e.g. roads, water, slash piles, etc.) or areas that have natural regeneration.

Flash Forest's process includes initial seed viability tests in Flash Forest's greenhouse facilities, suitability model-informed site selection through satellite data, end-to-end drone-based reforestation service, and post-monitoring and evaluation of germination and survival over several seasons post-plant. Flash Forest contracts out local cone collectors to achieve the required seed supply and ensure seedbanks of partners are not depleted. As of today, Flash Forest has anchored a specialization in boreal forest wildfire restoration, operating in six provinces, and has now expanded internationally in response to growing demands for its innovations, with client verticals spanning forestry, carbon, government, NGOs, and the corporate sector.

## Not a Silver Bullet

In no Canadian sector are the effects of climate change felt more strongly than in forestry. We need to re-think how forests are managed and how reforestation is engaged to adapt to a changing climate. New technologies, such as drone reforestation, hold promise for large-scale forest restoration efforts. They offer solutions to help meet this increasing demand in Canadian forests and beyond. Flash Forest is now actively expanding its operations with international partners in response to strong global interest in its innovations.

Within Canada, policymakers and provincial forestry ministries, landowners and private forestry companies must recognize that new technologies coming down the line are not a threat, but an asset to the domestic forestry industry. These technologies offer benefits of cost reduction, safety improvements, and increased scalability potential. They can also enhance long-term forest health through data-driven AI models, informing optimal site selection and forest biodiversity enhancement.

It's important to note that these new forest technologies are not a silver bullet for reforestation nor are they the best solution for all reforestation needs. Traditional planting will remain foundational in Canada's forestry industry into the foreseeable future. Drone-based and other new automated forest technologies are to be seen as a viable supplement to existing traditional practices, such as in severely burnt post-wildfire forests too dangerous or remote for traditional planting, or in areas which struggle to regenerate naturally. New and conventional methods together will enable meeting the increased scales and pledges required by corporations and federal governments, driven by our changing world.

*Bryce Jones is founder and CEO of Flash Forest.*

*Angelique Ahlström is co-founder and Head of Global Forestry Initiatives at Flash Forest.*



Indigenous Resource Network Executive Director John Desjarlais.- IRN

# Driving Canada's Economy Forward with Indigenous-Led Forestry

By John Desjarlais

Canada has a rich history in forestry, extending back to confederation and reaching far into the past with Indigenous communities utilizing the country's forests for various purposes. For instance, cedar holds significant cultural importance for the First Nations on Canada's West Coast. Canada is home to 9% of the world's forests, with 361 million hectares, or 40% of Canada's territory. The forestry sector contributed \$33.7 billion to Canada's economy in 2022 (nominal GDP), a 30% increase from 2020. Increasingly, that contribution is shared by the Indigenous economy, with about 1,400 Indigenous-owned businesses represented and 11,600 Indigenous Canadians employed in the sector, all contributing significantly to their communities and to Canada.

Climate change and the rising threat of forest fires have caused millions of dollars in damage, destroyed homes, and, tragically, claimed lives. Some of the major contributing factors to that spiralling damage can be addressed through Indigenous-led forestry practices. Indigenous forestry workers and entrepreneurs are leading the way in

innovative solutions, responsible development, and sustainable practices.

The Indigenous-led forestry industry can lead Canada's economy to finding unique innovative solutions to the problems facing decision makers. The Indigenous Resource Network's latest project, the documentary *Stewards of the Forest*, explores first-hand how Indigenous communities are facing these issues, and at the same time how Indigenous workers are leading the way in pioneering innovative solutions.

## Climate Change and Forest Fires

In 2023, Canada experienced one of the worst wildfire seasons on record, resulting in loss to homes and critical infrastructure, and posing risks to public safety and the health of Canada's natural ecosystem. Given the increasing impacts of climate change, more severe and frequent wildfires are a reality Canada must face and prepare for while we mitigate the devastating and costly impacts. Clearly, First Nations, Indigenous and even Inuit communities are at a higher risk of forest fires. In August 2023, the city of Yellowknife issued an evacuation order over forest fires. As early as May of this year, Doig River First Nation

and Fort Nelson First Nation issued evacuation orders for their communities early in the season.

Historically, forest fires have been seen as a natural part of the forest lifecycle; but climate change has resulted in more frequent and severe fires that have devastating consequences. In 2023 alone, forest fires generated 2.2 billion tonnes of greenhouse gas emissions and cost our country \$1 billion.

Through Indigenous-led, sustainable, and responsible forest management, the forest sector can lead solutions to help improve wildfire resiliency by removing sources of fuel on the ground to lower the intensity of wildfires, and increase both capacity and on-the-ground resources for Indigenous communities.

Indigenous knowledge and cultural practices, particularly prescribed burning, offer valuable insights into sustainable Indigenous forest management. First Nations, Indigenous, and Inuit communities have used cultural burning over millennia to manage forests, grasslands, and savannas. These controlled burns reduce fuel load, promote new growth, and maintain biodiversity, effectively reducing the risk and severity of wildfires.

Modern methods of forest management should integrate these Indigenous practices to promote holistic solutions facing Canada's ecosystem. By collaborating with Indigenous communities, we can blend traditional knowledge with contemporary science to create more resilient landscapes. This includes regenerating harvested areas with trees better adapted to future climate conditions and employing tree thinning and careful harvesting to remove decay and debris that can fuel wildfires. Foresters, alongside Indigenous firekeepers, can actively monitor and adjust harvesting schedules to favor older, insect-damaged, high-risk stands.

To unlock the potential of Indigenous-led and forest-based solutions to wildfire impacts, government support is essential. This includes:

- **Indigenous ownership:** Increase the access to capital for Indigenous communities to pursue ownership of forestry operations including timber, harvest areas, and in companies to help foster smarter and sustainable practices.
- **Indigenous-led wildfire management:** For millennia, Canada's Indigenous Peoples, acting as stewards, have used controlled burns to manage forests and rangelands. These burns were strategically timed and placed, drawing on deep traditional knowledge of the land.
- **Indigenous-led forest management:** Enhancing capacity for Indigenous-led fire management by extending financial and logistical support for Indigenous communities and leveraging existing clauses and programs for their participation.
- **Indigenous regulators:** Elevating fire protection as a national policy objective and devolving regulatory responsibilities to Indigenous communities. Indigenous ownership over regulation can be a more efficient and proactive approach to projects and harvesting.

To their credit, governments have been proactive in engaging in positive policy development, including the Canadian Council of Forest Ministers (CCFM), which recently released the Canadian

Wildland Fire Prevention and Mitigation Strategy. Among other functions, the strategy outlines capacity for Indigenous communities to prevent and mitigate forest fires. According to Derek Nighbor, President and CEO of the Forest Products Association of Canada (FPAC), "We must look at land planning and forest management through a fire lens in this country. That includes accelerating and increasing investments in fire shed mapping, supporting more active thinning and community fireproofing, and establishing a clear national effort to find valuable uses and markets for low-grade wood and biomass."

The safety of Indigenous communities, the environment, and the health of our forests are all at stake if government and our political leaders don't commit to proactive and urgent action that puts Indigenous communities at the forefront in Canada's solution to climate change.

### **Indigenous-Led Forestry**

Indigenous-led forestry plays a crucial role in managing Canada's forests, underscoring the deep cultural, economic, and traditional connections Indigenous peoples have with the land. The forest sector's commitment to economic reconciliation with Indigenous communities fosters opportunities for businesses and careers, ensuring Indigenous representation and talent development. This commitment is shown through real benefits for communities and workers, with the sector supporting jobs in over 400 Indigenous communities, with about 1,400 Indigenous-owned businesses represented and 11,600 Indigenous Canadians employed in the sector.

These businesses range from traditional infrastructure such as sawmills to innovative biofuel production, promoting diverse opportunities and inclusive employment for Indigenous people. Indigenous management of forest resources has increased by 135% since 2003, now encompassing more than 17 million hectares, or about 7.5% of Canada's total managed forest area. Each Indigenous-owned business typically employs between 10 and 30 people, with many generating over

\$1 million in annual revenue. This Indigenous stewardship is vital for both the preservation of cultural heritage and the economic growth of the Indigenous forestry sector.

### **A Beacon of Hope**

Canada's forestry sector stands at a crossroads, facing significant challenges related to the economy, climate change, and forest fires. The historical and cultural significance of forests to Indigenous communities highlights the deep-rooted connections and knowledge that can be pivotal in addressing these issues.

As Canada grapples with economic uncertainties, inflation, and slow production, the Indigenous forestry industry offers a beacon of hope. Indigenous forestry workers and entrepreneurs are spearheading innovative solutions and sustainable practices that can help navigate the country through its current economic and environmental difficulties. Through traditional knowledge, particularly in forest management and prescribed burning, Indigenous people provide invaluable insights into creating resilient landscapes and mitigating the risks of severe wildfires.

Government support is crucial to unlocking the full potential of Indigenous-led initiatives. This includes increasing access to capital, enhancing Indigenous-led wildfire management, and promoting Indigenous ownership and regulation in forestry operations. The Canadian Council of Forest Ministers' proactive stance and the Canadian Wildland Fire Prevention and Mitigation Strategy are steps in the right direction, but more urgent and committed action is needed.

Ultimately, prioritizing Indigenous leadership and expertise in forestry is essential for the well-being of Canada's forests, the safety of its communities, and the health of the environment. With collaborative efforts and strong government support, Indigenous-led forestry can be a cornerstone in driving solutions to Canada's most pressing issues.

*John Desjarlais is executive director of the Indigenous Resource Network and is Nehi-naw Métis from Cumberland House, SK.*



*Managing and using forests for decarbonization is Canada's most valuable tool, writes Dr. Jamie Stephen. —FPAC*

# Going Negative: How Canada Can Help Decarbonize the World

**By Dr. Jamie Stephen**

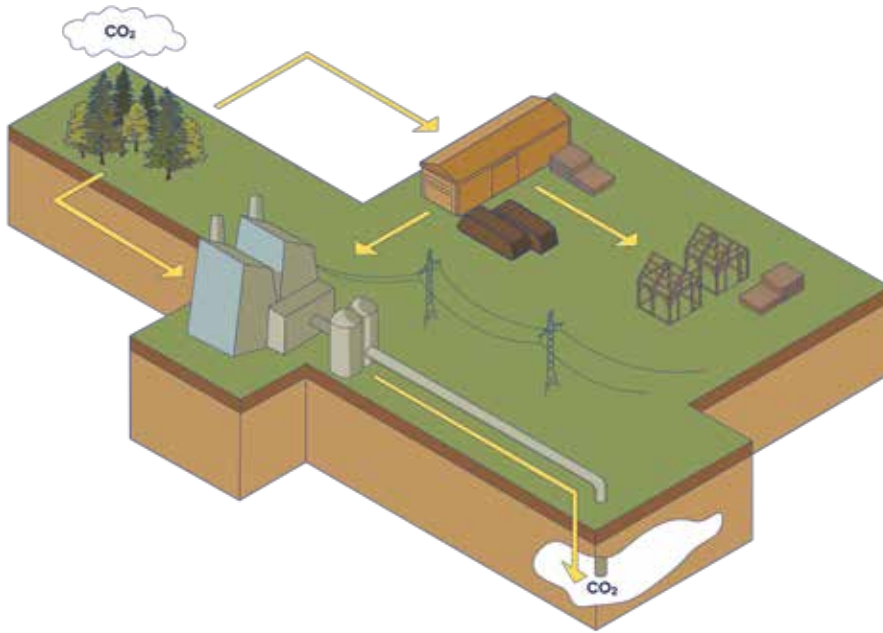
**W**hat is the primary problem with Canada's climate policy? It is not designed for Canada. It does not reflect our northern, resource-dependent economy. Nor does it reflect the geographic realities or regional differences of Canada. In general, a moral argument, instead of an economic one, has been used for climate policy. This, along with spurious claims that buying an EV or heat pumps will stop wildfires or floods, has led to public disillusionment on climate action. It doesn't need to be this way. Canada can be a

world leader in decarbonization – not only of our own economy, but those of other nations as well. But it requires a complete shift in climate policy approach and mindset to one that values economic efficiency, carbon efficiency, and exports.

First, let's be clear about what Canada, a trade dependent nation, supplies to the world. On a net basis, Canada's largest exports are oil, agricultural products, forest products, fossil gas, metal and mineral products, metal ores, and coal. These categories represent 97% of our net exports and are what the world looks to Canada to supply. We have a competitive ad-

vantage. In comparison, we are a major net importer of consumer goods, industrial machinery, automobiles (a negative trade balance of C\$40 B in 2023), electrical equipment, industrial products, and services. While there are certain subsectors where we excel, it is hard to see how Canada has a competitive advantage in any of these sectors broadly since they rely upon very large, low-cost workforces to be globally competitive. Canada has neither a large nor a low-cost workforce.

There is no scenario in which decreasing energy exports doesn't lead to a significant decline in the standard



*BioEnergy with Carbon Capture and Storage (BECCS) combines the CO<sub>2</sub> removing power of trees with technology/TorchLight graphic*

of living for Canadians. An energy transition consisting of widespread electrification using imported solar panels, wind turbines, heat pumps, and EVs, as currently envisioned by many policymakers, will simply not happen. It is too economically destructive to be supported by the population over an extended period of time, which means any government will lose power (pun intended) before this all-electricity utopia can become a reality. The idea that domestic consumption of renewable electricity will somehow replace oil, forest products, or fossil gas exports is disingenuous at best.

### What are trees?

Does this mean Canada must always be a laggard in climate action or that we must sacrifice economic growth for the sake of the climate? Absolutely not. Some will argue continued use and export of fossil fuels is simply not consistent with climate goals. That is true if you only consider one side of the carbon equation. Getting to zero absolute emissions would require eliminating all fossil fuels. But we don't call it absolute zero. We call it Net Zero. Economic efficiency and carbon efficiency require us to look at

the other side of the carbon equation: negative emissions. These negative emissions are a permanent removal of carbon from the atmosphere, with the carbon stored 2-3 km below the surface of the earth. While much attention in North America has been paid to the use of Direct Air Capture (DAC) – giant fans – to remove carbon from the atmosphere, we in Canada have an abundance of a much more advanced technology: trees.

What are trees? It may seem a ridiculous question but fundamentally, they are CO<sub>2</sub> removed from the atmosphere, water pulled from the ground, and solar energy captured from the sun. Combustion of wood releases that solar energy, the water, and the CO<sub>2</sub>. Obviously, trees are much more to us than these three components, but from a chemical and energetic perspective, trees are stored carbon, water, and solar energy.

So how do trees allow us to meet climate goals while growing our resource-dependent economy and meeting the energy needs of our international customers such as Japan, Korea, Germany, and the UK? By coupling the power of healthy, growing trees to remove CO<sub>2</sub> from the atmosphere with a technology com-

bination known as BECCS: BioEnergy with Carbon Capture and Storage. The BioEnergy component is the use of wood to meet domestic heat and power needs for buildings – via district heating – and industry. Then, there is the carbon capture and storage part of BECCS. Since the CO<sub>2</sub> in wood originated in the atmosphere, capturing and permanently storing it following bioenergy generation results in a net carbon dioxide removal (CDR) from the atmosphere.

Canada shares its atmosphere with all other countries, which means the emissions that are removed using BECCS in Canada could have originated anywhere in the world – including from the natural resources we export. In addition to supplying negative carbon heat to district heating networks in cities, we can use negative emissions energy from BECCS to recover and process natural resources to make them zero or even negative carbon intensity, removing the emissions before they occur.

### Going Negative

This is how Canada can outcompete in a world that values carbon – by producing and exporting crude, fossil gas, and refined products that are the lowest carbon in the world. The Middle East has lower crude production costs and upstream GHG emissions than traditional oil sands operations, but it lacks the forest resources to go negative. It also means that Canada can hedge the world's appetite for low-carbon but higher cost products by continuing to develop natural resources, knowing that if customers are truly willing to value carbon, we can supply low or even zero-carbon finished fossil fuels.

Why not just use those giant DAC fans to remove the CO<sub>2</sub> from the atmosphere and leave our forests alone? Three reasons. First, DAC is a massive consumer of energy. BECCS is called BioEnergy with CCS for a reason – it generates energy and CDRs. Second, cost. Under no circumstances will it be lower cost to pull CO<sub>2</sub> out of the atmosphere with fans than growing

a tree. And thirdly, the baseline. The baseline in Canada without BECCS is massive wildfires, air pollution, and carbon losses from our forests. DAC has no such imperative for action. In other words, BECCS generates valuable energy while realizing four decarbonizations at once: heat, electricity, CDRs, and avoided carbon losses from Canada's forests.

Alternatively, why not stop using fossil fuels and embrace 'clean fuels', the Government of Canada's shorthand for non-fossil fuels such as liquid bio-fuels? Carbon and cost efficiency. A tonne of wood used in a heat-and-power BECCS plant in Alberta reduces GHG emissions by six times compared to conversion of that same tonne of wood into renewable diesel or 'sustainable aviation fuel' (SAF). BECCS is also a fraction of the cost per tonne of CO<sub>2</sub> and the technology is much lower risk. We live in the economic reality that there is a limit, in dollars per tonne of CO<sub>2</sub>, that consumers or companies can bear. In many cases, such as aviation, it is simply much more carbon- and economically efficient to continue use of fossil fuels but to remove the emission via BECCS. We must be pragmatic about achieving our goals.

### Global Market Share

If you are under the mistaken belief that leaving Canada's forests alone will have a positive climate impact, have another look at the numbers. Forests are by far the country's largest source of emissions of both greenhouse gases and air pollution. Several times more than everything else combined. When forest emissions are included, Canada's GHG emissions in 2023 were more than those of the entire EU. On a per capita basis, 100 times that of Sweden, another northern, boreal country. Forest carbon offset projects, which seek to 'protect' forests and store carbon, massively constrain the contribution of forests to climate mitigation. There is a limited amount of carbon that can be stored on a hectare of land. In comparison, BECCS allows us to manage forests to be healthy, productive, and



*The wood chip-fuelled KVV8 combined heat and power plant in Stockholm —Holger Ellgaard*

continuously remove CO<sub>2</sub> from the atmosphere. Managing and using forests for forest products and BECCS is Canada's most valuable tool for decarbonization. Besides, as our wildfires show, offset 'forest protection' projects are temporary and, frankly, don't work in forests with high disturbance risk. Canada's National Parks, the epitome of protection, are a net source of GHG emissions. And as the damage from the Jasper fire showed, GHG emissions can be the least of our worries when wildfires rip through overaged, high-mortality forests.

The scale of the BECCS opportunity in Canada is beyond that of any other sector – in both carbon and economic terms. If Canada managed its forests like Sweden, which harvests seven times the volume per forested hectare as Canada and is, counterintuitively, increasing forest carbon stocks, Canada would generate an additional billion tonnes of wood per year. If we used that wood for decarbonizing industry and buildings while storing the captured CO<sub>2</sub> underground, GHG emissions could be reduced by approximately 1.4 billion tonnes per year. This is more than double Canada's total GHG emissions, meaning we could export CDRs of sufficient volume to eliminate all of the EU's transportation emissions or almost all national emissions of Japan. By far

Canada's largest net-export product is crude oil, which totaled \$124 B in 2023. A billion tonnes of CDR exports at \$170/t CO<sub>2</sub>. Well, the math is simple. The Intergovernmental Panel on Climate Change (IPCC) models that we need 5-10 billion tonnes of BECCS CDRs by 2050 to meet Paris Agreement goals. Why can't Canada have a 10-20% global market share?

Leadership starts at home. Canada's existing forest products industry already generates over 40 million tonnes of biogenic CO<sub>2</sub> stack emissions per year. Capturing the CO<sub>2</sub> from just four existing pulp mills in Alberta would eliminate all domestic aviation emissions in Canada. That is something Canadians can understand and get behind. And something that would show Canada is serious about its international commitments and customers. Oil and gas cap? Canada's wildfires of 2023 produced 75% more GHG emissions than the oil sands – for its entire history since 1967. Government policy has clearly lost the narrative that climate is a numbers game, and we are losing. No matter what your political stripe or rhetoric, it is impossible to argue that we are doing a good job on climate action or carbon emissions. Right now, we are not climate leaders. We need a new approach.

*Dr. Jamie Stephen is Managing Director at TorchLight Bioresources.*



*While new technologies offer powerful forestry tools, they're no substitute for 'boots on the ground' write the authors. —Adobe*

# Forestry in the Digital Age: Why Experience Still Matters

**By Tom Grabowski  
and Alexander Bilyk**

As with so many other sectors, technology has changed how the forest industry solves problems – whether in carbon monitoring, biodiversity management, EU Deforestation Regulation (EUDR), supply chain issues, ESG reporting, or active forest management. As natural resource management consultants who've been at the leading edge of technology and forestry for decades, we've repeatedly seen the purveyors of new technologies make promises they simply cannot keep. We're also concerned that the forest industry and government are re-inventing the wheel through an ignorance of historical research and accomplishments.

Canada has been a global leader in applying remote sensing and other modern technologies to map its vast forests and assist with forest management. Technologies deployed with much fanfare include Landsat in the 1970s, multispectral/multiscale imagery and RADARSAT in the 80s and, more recently, LiDAR, drones, and artificial intelligence. Yet, amid the excitement around new technology, it is essential to recognize a fundamental truth: technology is not a replacement for human experience. Accurately interpreting data comes from years of “boots on the ground”, not just from computer algorithms. LiDAR, the technology-du-jour, is now recognized as a critical tool for forest management. It is very accurate at measuring canopy height, densi-

ty, and even biomass. However, interpreting LiDAR data to distinguish among tree species, age classes, or forest-fire fuel types requires expert analysis. The raw data must be processed and validated by those with extensive field experience to yield meaningful insights.

Drones have revolutionized forest monitoring by providing high-resolution, on-demand imagery. They offer unprecedented flexibility in data collection, allowing for targeted surveys and frequent updates. However, processing and analyzing drone imagery to extract useful information requires significant expertise. Drones can identify harvest block boundaries, monitor regenerating forests, and assess damage from



pests or storms, but translating these observations into effective management strategies relies on practical field experience.

### Deep Understanding

Forestry professionals possess a deep understanding of forest ecosystems, enabling them to make informed decisions that technology alone cannot. This expertise is crucial for interpreting remote sensing data, validating results, and making practical decisions. The knowledge and intuition developed over years in the field cannot be replicated by algorithms or automated systems. For example, veteran foresters can recognize subtle signs of forest health issues, such as changes in leaf color or patterns of tree mortality, that may be missed by automated systems. Technology should empower forestry professionals to make faster decisions and improve field efficiency, but never be used as a full replacement. Chasing after the latest shiny object is not a substitute for solving problems by engaging professional foresters with years of knowledge and experience.

Recently, we have seen the pace of global image capture ramp up. With the advent of micro satellites like those deployed by Planet, the entire earth is imaged daily at a resolution 10x that of Landsat. This high-frequency data collection can significantly enhance forest monitoring efforts, allowing for the rapid detection of changes and more timely responses to issues such as illegal logging or natural disturbances. However, the sheer volume of data generated by such frequent imaging necessitates sophisticated analysis techniques and experienced interpretation to extract meaningful insights and actionable information.

Artificial intelligence (AI) has the potential to play a transformative role in forestry by automating data processing and enhancing the analysis of remote sensing imagery. Machine learning algorithms can be trained to identify patterns and anomalies in large datasets, potentially uncovering trends that might be overlooked by human ana-



*“Training programs must emphasize the importance of both technical skills and field experience,” write Grabowski and Bilyk. —Adobe*

lysts. AI can assist in tasks such as classifying tree species, detecting signs of disease, and predicting forest growth patterns. Nevertheless, the successful application of AI in forestry still relies on the expertise of experienced professionals, like well-trained photo-interpreters, to train the algorithms, validate their outputs, and integrate the insights into practical management strategies.

### Irreplaceable Insights

Remote sensing and other technology tools, when used in conjunction with the expertise of foresters, can lead to more effective and efficient forest management. This synergy allows for better monitoring, planning, and decision-making. For instance, accurately measuring and managing forest carbon stocks necessitates both advanced technology and expert validation. Remote sensing can estimate carbon sequestration potential and track changes over time, but ground-based measurements and expert analysis are essential to ensure accuracy and to interpret the implications for forest management and climate policy. Some of the recent debacles in the forest carbon validation space appear to be the result of too much trust being placed in purely theoretical or academic solutions by people with limited practical forestry expertise.

The forest sector must evolve to integrate technology with human expertise. Training programs must emphasize the importance of both technical skills and field experience, preparing new professionals to bridge the gap between emerging technologies and practical application. Collaborative efforts among academic institutions, industry and government agencies must foster this integration, ensuring that the next generation of foresters is well-equipped to face the challenges ahead. We cannot lose field experience in our post-secondary forestry and environment education.

While new technologies offer powerful tools for forestry, they are not substitutes for the expertise of experienced forestry professionals. A balanced approach, combining technological advancements with experience, is essential for sustainable forest management. By recognizing the limits of technology and valuing the irreplaceable insights of experienced forestry professionals, we can ensure that our forests are managed effectively and responsibly.

*Tom Grabowski is president, CEO and co-founder of the Silvacom Group.*

*Alexander Bilyk is director of innovation for Silvacom.*



B.C. is striving to be a leader in climate-smart forestry practices, writes FESBC Executive Director Steve Kozuki (R). —Tiffany Christianson Photography

# British Columbia's Transition to Modern, Climate-Smart Forestry

**By Steve Kozuki**

The Forest Enhancement Society of BC (FESBC) was established by the Province of British Columbia (B.C.) as a crown service delivery agency to create lasting benefits to the province's environment, wildlife, forest health, and communities. Over 300 FESBC-funded projects have advanced transformation in B.C.'s forest sector considerably by supporting modern, sustainable forestry practices as proposed by locals who live, work and play in its forests:

- Indigenous engagement: FESBC has increased Indigenous Peoples' participation and leadership within the forest economy, creating a shift toward more inclusive economic practices.
- Climate action: The Society has enabled local people to take actions which have resulted in a cumulative net greenhouse-gas benefit equivalent to removing more than one million cars from the road for a year.
- Wildfire risk reduction: More than 120 communities have seen reduced wildfire risks through FESBC-funded projects, enhancing community safety while at the same time creating numerous co-benefits.
- Ecological recovery: FESBC has accelerated ecological recovery in areas devastated by beetle epidemics and wildfires.
- Wildlife habitat enhancement: The Society has improved wildlife habitats for an array of species.
- Community stability: The Society has created sustainable jobs in forest-dependent communities and throughout the supply chain.

FESBC's approach involves collaborating and partnering with a wide array of organizations, including Indigenous Peoples, community forestry groups, grassroots community associations, municipalities, regional districts, woodlots, the provincial Ministry of Forests and Ministry of Environment and Climate Change Strategy, contractors, forest consultants, and forest companies large and small. These collaborations have not only been a catalyst for different groups to work together for the first time, but they have also provided a platform to forge stronger, deeper partnerships leading to innovative solutions.

## Fostering Transformation

Since its establishment in 2016, FESBC has advanced an ambitious vision: to enhance forest resilience to wild-fire and climate change for the lasting benefit of British Columbia's environment, wildlife, forest health, and communities. FESBC has created permanent shifts contributing to the transition of B.C. to a modern era for forestry. Recognizing that forests contribute significantly to the well-being of wildlife, people, and broader environmental health, FESBC-funded projects have demonstrated that it is not only possible but desirable that forestry projects achieve multiple objectives at the same time with the same funding. Well-designed projects synergistically and simultaneously achieve social, environmental, and economic benefits.

## Achievements and Impact

FESBC's initiatives have led to significant, lasting transformations:

- Utilization of low-quality wood fibre: Transitioning from burning to utilizing waste wood (left over from normal harvesting or other forest operations), FESBC has improved the economic and environmental viability of low-quality wood fibre. This shift required overcoming substantial economic barriers, fostering partnerships, and investing in proper equipment, ultimately reducing greenhouse gasses, expanding the bioeconomy and creating benefits for local communities.
- Restoration of natural forest conditions: To address forest overgrowth due to historical wildfire suppression, communities — with support from FESBC — are taking steps to restore natural ecosystem functions. These include reducing wildfire risks, improving wildlife habitats and enhancing the health of forests, making them more resilient against diseases, pests, and climate impacts. While there will still be forest fires, as nature intended, the lower intensity of fires in treated zones near communities will help restore natural ecological functions and wildlife habitat.

- Empowerment of Indigenous communities: FESBC has significantly enabled Indigenous Peoples to lead forestry projects, blending traditional knowledge with modern forestry practices. A notable example is a tree thinning and fertilization project with the Williams Lake First Nation that not only aims to increase timber supply but also to enhance food resources such as berry production.

Since its inception, FESBC has encouraged local communities to propose projects that reflect their specific needs, leading to innovative solutions that address environmental challenges while supporting economic development.

## Forestry and Reconciliation

Over 30% of FESBC projects are led by Indigenous groups, enhancing reconciliation efforts and community empowerment. FESBC funding has greatly enabled Indigenous Peoples to participate more fully in the forest economy and the bioeconomy in B.C. In one project, two Nations melded their multi-generational caretaker cultural perspective with cutting-edge LIDAR and GPS-guided industrial drones to plant tree seeds in the aftermath of a mega-fire.

Today, as witnessed in many such FESBC-funded projects, First Nations are moving up the ladder and becoming leaders in forest management. They are becoming decision-makers about how, when, and in what manner their projects on the land are conducted. This approach has fostered mutual respect and understanding among Indigenous groups and other community stakeholders. In a small but important way, FESBC's funding of projects led by First Nations helps contribute to reconciliation.

## Growing the Bioeconomy

FESBC has played a pivotal role in advancing the bioeconomy by utilizing forest residuals (logging waste) for energy production and other bio-products, which helps mitigate climate change by reducing carbon emissions. The transition from waste burning to biomass utilization is a win/win solution

for the environment and the economy — something the province's Clean BC Plan strives for. This action on climate change contributes significantly to Canada's international commitments to reduce greenhouse gases.

Many FESBC-funded projects turn woody logging waste into green energy or useful forest products such as wood pellets. Logging waste is uneconomical — high cost, low value — and would otherwise be burned in slash piles. Not burning these piles results in less smoke in the air and a net reduction of greenhouse gas emissions (as verified by modelling in accordance with international carbon accounting standards). However, using waste wood from forests could be considered economical if benchmarked against carbon taxes of \$65/tonne CO<sub>2</sub>e.

Historically, sawmills supplied waste fibre to industries like pulp mills, pellet plants, and bio-electricity generators in B.C. However, in recent years with many sawmills shutting down, there has been a shift toward utilizing more forest-derived waste fibre (waste wood from harvesting). This transition has seen new partnerships formed to adopt innovative practices. A notable example involves the Simpcw First Nation, which contributes wood from their logging activities that would otherwise be discarded. This wood is processed by Arrow Transportation Systems at their River City chip facility, where they also innovated processes for using fire-damaged trees for pulp chips. Subsequently, the Kruger pulp mill uses these materials to produce sustainable building products like cement board siding and to generate green energy, enough to supply about 60% of the city of Kamloops' electricity needs.

## Factors of B.C.'s Success

A community-driven and inclusive approach: FESBC empowers local and Indigenous communities to define and drive projects based on their unique insights and priorities, ensuring relevance and impact. Inclusiveness is enhanced by requiring no proponent cost contributions, making programs accessible regardless of financial resources.

**Innovation and flexibility:** By supporting a diverse range of projects, including those that try new practices and technologies, and by encouraging new entrants without previous experience, FESBC fosters innovation and welcomes new entrants to the forestry sector.

**Strategic partnerships and synergies:** FESBC builds strong, cross-sector relationships that enhance project effectiveness and create synergies, facilitating collaborative and transformative outcomes.

**Supportive and accessible funding:** FESBC removes barriers to funding, actively coaching applicants and strategically allocating funds to maximize the achievement of multiple benefits.

**Operational excellence:** With the lowest administration costs among com-

parable programs, FESBC delivers excellent value for the money.

**Communication leadership:** FESBC provides communication leadership to project proponents, equipping them with the tools and strategies necessary to help them tell their stories to their communities. This effort helps build a broader understanding and acceptance of forestry initiatives, building social license and engaging the community at a grassroots level.

**Commitment to long-term, transformational impact:** FESBC prioritizes projects that drive significant, long-term benefits, aiming to foster sector-wide changes that contribute to ecological sustainability, economic stability, and community resilience. FESBC focuses on projects that promise lasting benefits and structural

shifts within the forestry sector. These carefully selected initiatives not only support immediate economic needs but also ensure long-term sustainability and increased First Nations participation in the forest economy.

FESBC's approach is a case study of how careful and thoughtful targeted investments in forestry can result in transformative and lasting benefits. B.C. is striving to be a leader in climate-smart forestry practices that can serve as an inspiration for other jurisdictions in Canada and beyond.

To learn more about FESBC's projects, visit [www.fesbc.ca](http://www.fesbc.ca) or contact FESBC staff for more detailed information on how you can get involved or learn more from these initiatives.

*Steve Kozuki is executive director of the Forest Enhancement Society of BC.*

## Celebrating Excellence

### Recognizing Canadian Forestry Innovation Award Winners



Scan this QR code to read more about Penghui and Manon.

Forest Products Association of Canada (FPAC) is pleased to announce Penghui Zhu from UBC and Manon Beaufils-Marquet from ULaval as this year's Chisholm Awards for Innovation in Forestry recipients. This annual national award recognizes emerging young leaders and innovative research developments in climate-positive forestry, clean manufacturing, and the forest bioeconomy.

#### Penghui Zhu

Penghui's research pioneers the development of cellulose films for plastics replacement, offering a biodegradable solution to packaging materials.



#### Manon Beaufils-Marquet

Manon's project utilizes cellulose fiber from the pulp and paper industry to create sustainable insulation solutions that meet construction standards.





*The mass timber office building in the Paris Olympics Athlete's Village —Dezeen*

# Building a Sustainable Future: Scaling Canada's Mass Timber Sector

**By Dr. Bentley Allan  
and Dr. Derek Eaton**

If you watched the 2024 Summer Olympics, you may have noticed something different about the Paris Olympic Village landmarks visible in the coverage. From the saddle-shaped Aquatics Centre (prefabricated in a village near the German border) to the athletes' residences to the main Athlete's Village office building (above), the Paris games were an unprecedented global showcase for mass timber. As Bloomberg noted in its coverage of Paris's novel, sustainable approach to Olympic architecture, "The potential advantages of building in wood are legion."

Canada's mass timber industry is ready to seize mass timber's international moment, and close the gap with European leaders. The sector is already on the cusp of significant expansion, with the potential to revolutionize both our construction industry and our human landscape. More than a decade of work has already unlocked and demonstrated the advantages of mass timber, from its potential to support the drive to net-zero, to its role in addressing the housing crisis and the jobs it can create in rural and Indigenous communities.

The term "mass timber" describes a class of engineered, wood-based structural building materials increas-

ingly used in residential construction and large-scale infrastructure projects. The range of mass timber products includes cross-laminated timber (CLT), glued laminated timber (glulam), nail-laminated timber (NLT), dowel-laminated timber (DLT), mass plywood panels (MPP), laminated veneer lumber (LVL), parallel strand lumber (PSL), and laminated strand lumber (LSL).

With nearly 700 mass timber buildings completed in Canada and at least 140 more projects under construction or in planning stages, the burgeoning local and international demand for mass timber beams, panels and buildings underscores the indus-



Mass-timber construction can reduce embodied carbon by as much as 40%. —Adobe

try's capacity to add substantial value to our forest sector. However, there is still crucial work ahead.

Canada boasts excellent wood resources and supply chain expertise. To build on that foundation and develop a world-class mass timber sector, industry and government must adopt a strategic approach to forestry resource utilization. Instead of a commodity-based, volume-driven approach, we should view our forests as a national resource that can drive economic diversification. As an alternative to, and enhancement of, conventional building materials, mass timber presents a unique means of contributing to three crucial goals:

1. Addressing the housing crisis: Initially recognized for “tall wood” buildings and showpiece non-residential structures, mass timber is now primed to become a mainstream material of choice in residential applications, especially in the 4-6 storey range and more common 7-12 storey buildings, including hybrid structures that combine wood with steel and concrete. Mass timber designs, espe-

cially those incorporating prefabrication and modular approaches, offer a promising strategy to construct multi-unit residential structures more quickly and cost-effectively. Prefabrication allows entire wall assemblies to be manufactured and customized offsite, significantly shortening construction times by up to 20 percent and reducing costs.

2. Creating good jobs in rural and Indigenous communities: Mass timber can revitalize rural and Indigenous communities, creating good jobs and integrating these communities into a future economy which, too often, Canada's resource workers feel left out of. Mass timber offers a pathway to ensure these communities benefit from the net-zero transition.
3. Supporting net-zero buildings: Mass timber reduces the carbon intensity of construction by lowering emissions from conventional materials and by providing long-term carbon storage. Using wood products alongside other cost-effective decisions can reduce embodied carbon by as much as 40

percent, significantly lowering the overall lifecycle emissions of buildings.

Recognizing mass timber's social and economic benefits, countries worldwide are racing to seize the opportunities it offers in the transition to a net-zero world. Canada, however, is falling behind. Many domestic mass timber projects source products like CLT panels from Europe rather than local manufacturers. To compete globally, Canada needs an efficient, integrated forest-to-buildings value chain. Transforming primary resources into high-value products incorporating innovative technologies and advanced skills is crucial for Canada's long-term economic success. Capturing manufacturing value-added can increase productivity and drive growth, providing net-zero building solutions and green jobs to forestry communities.

### Our Vision and Roadmap

To address these challenges, in 2023, the Forest Products Association of Canada (FPAC), the Canadian Wood Council (CWC), the Energy Futures Lab (EFL) and the Transition Accelerator convened more than 50 participants from Canada's mass timber value chain, representing business, government, research institutions, Indigenous communities, and non-governmental organizations (NGOs). Over a series of workshops, these participants worked together to co-create The Mass Timber Roadmap for an integrated forest-to-buildings supply chain in Canada.

This ambitious plan envisions increasing the mass timber market to \$1.2 billion by 2030 and \$2.4 billion by 2035, reflecting expected market growth in Canada and the US.

### Achieving the Vision

To achieve this, coordinated efforts must address three critical actions:

1. Create a public-private collaboration to develop and advance a policy package that will add value to

Canada's forest resources while building homegrown capacity along the supply chain.

2. Standardize building archetypes, wood specifications, and connectors across the whole supply chain.
3. Develop and implement a skills development plan that covers all aspects of the supply chain.

To coordinate and clarify more specific actions, the roadmap divides the mass timber ecosystem into five workstreams, each with its own near-term goal, along with specific targets, goals and actions needed for each of these workstreams to advance the mass timber industry in Canada today:

- **Forestry and Wood Supply:** Advance mass-timber specific milling and drying needs while scoping out the transformative changes to harvesting and timber grading that would be needed to create an integrated mass timber supply chain.
- **Manufacturing:** Increase production capacity, including pre-manufacturing of lamina and billets, and prefabrication.
- **Architecture, Building Codes, Design, and Fire Safety:** Identify strategic niches for prefabricated connections and secure low-hanging-fruit changes in building codes.
- **Construction:** Drive the uptake of mass timber as mainstream material in construction and expand beyond one-off buildings into repeatable forms, large building markets, and hybrid construction.
- **Policy, Programs, and Sustainability:** Develop a policy package – with measures such as grants, tax incentives, R&D programs, and lifecycle analysis (LCA) synthesis, among others – that would help the industry scale-up while building homegrown capacity along the supply chain.

### A Call to Action

To scale, mass timber needs the right incentives to overcome a chicken-and-



*Modular mass timber structures offer a cost-effective solution to Canada's housing shortage. —Adobe*

egg situation in the value chain. Manufacturers need to see market demand to justify large capital investments, while building designers and developers need assurance of timely supply of mass timber products.

Given the integrated and dynamic nature of the challenge, the actions in The Mass Timber Roadmap now need to be advanced by an alliance of industry and other stakeholders, working closely with governments. A coordinating council should oversee implementation of the roadmap, supported by individual task forces for each of the five respective workstreams.

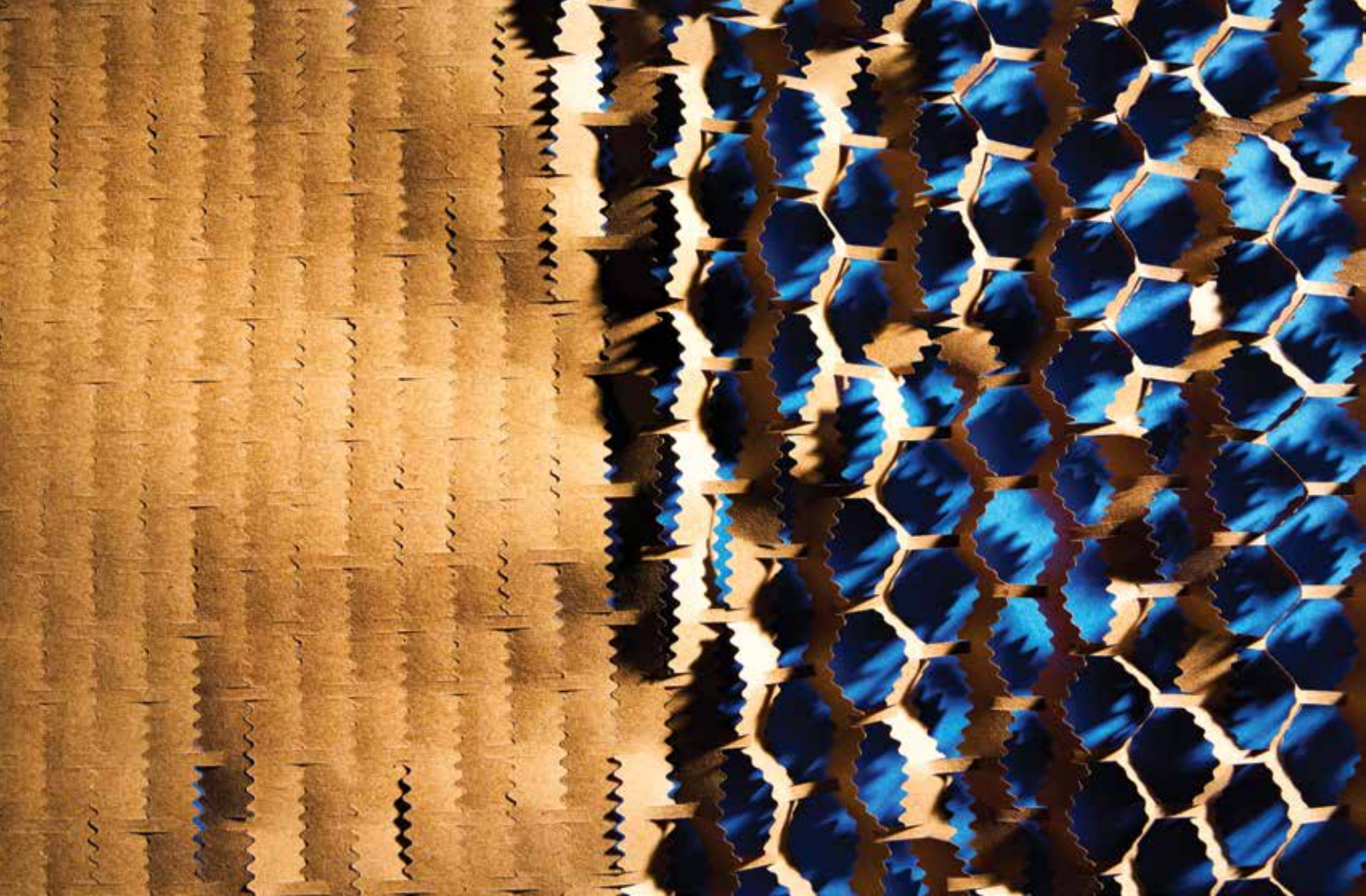
We invite governments at various levels to play a critical role in the implementation of the roadmap. They need to be active participants in the process, as members of the council and task forces. The federal government and relevant provincial governments should treat the Mass Timber Roadmap process as a strategic priority initiative. Learning from international examples of successful initiatives, the implementation of the roadmap can best be approached as partnership between public and private sectors.

### The Path Forward

Canada has a major opportunity to scale the mass timber sector in response to significant market demand, domestically and internationally. Not only does supporting this sector have the potential to provide significant economic and social benefits — generating regional economic development opportunities and skilled jobs while also playing a major role in addressing Canada's housing shortfall — it can also contribute to Canada's net-zero goals, combining faster and less-costly construction with reduced carbon footprints. Through intentional and concentrated effort now of businesses and other actors throughout the ecosystem, we can seize this opportunity to build a better, more prosperous, net-zero future for Canada.

*Dr. Bentley Allan is Assistant Professor of Political Science at Johns Hopkins University, founder and co-director of the Net Zero Industrial Policy Lab and transition pathway principal for the Transition Accelerator.*

*Dr. Derek Eaton serves as Director of Future Economy for the Transition Accelerator.*



3M's Cushion Lock™ protective wrap: a sustainable alternative to bubble wrap. —3M

# 3M: Fostering Sustainability Within a Circular Economy

**By Dr. Marie-Claude Brandys**

According to the United Nations, the world's population is more than three times larger than it was in the mid-20th century and it is expected to increase by nearly two billion people in the next 30 years. This rapid growth brings with it urgent challenges, including limited natural resources, food scarcity, rapid urbanization, and climate change. These challenges demand innovative solutions and a concerted effort to ensure a sustainable future for generations to come.

At 3M Canada, we are committed to driving progress in our environmental, social, and governance practices with a strong focus on advancing sustainability. Beginning in 2019, 3M has promised that every new product that enters the new product commercialization process must have a Sustainability Value Commitment demonstrating how it drives impact for the greater good.

A Sustainability Value Commitment in new products is a clear demonstration of how the products integrate environmental and social factors to contribute to our aspirations. This can

include reusability, water savings or responsible sourcing. It can also include products whose core purpose helps to solve an environmental or social problem – such as improving air quality or reducing greenhouse gas emissions.

Central to our sustainability efforts is the pursuit of a circular economy, where materials are reused and repurposed, reducing waste and their impact on the environment.

## **Creating a circular economy**

Climate change is affecting us all. Extreme weather events, rising sea



levels, and other environmental impacts are shaping the daily decisions that we all make. We recycle and compost, conserve water and electricity, but we cannot do it alone. In today's era of growing environmental concerns, manufacturers especially have an important role to play. The goal is to do more with less, keeping products and materials in use longer, and reducing or eliminating waste and pollution.

Among other things, the COVID-19 pandemic accelerated the shift to online shopping due to government restrictions and consumer health concerns. As online shopping surged, so did the need for sustainable materials to minimize packaging waste and environmental footprints. Designing packaging with both consumer needs and environmental impacts in mind became increasingly critical during this time.

A prime example of this is the Scotch™ Cushion Lock™ Protective Wrap. Made from 100% recycled paper, this innovative product is a sustainable alternative to traditional plastic bubble wrap that maintains the same level of protection as plastic packaging material.

Unlike conventional plastic bubble wrap, which has been the industry standard for decades, Cushion Lock™ expands up to 60 times its original volume to fill packing boxes efficiently with less material. Once the product has done its job, it can easily be recycled with other curbside materials, such as plastics, cardboard, or glass.

### **Circular Packaging**

Today's complex global supply chain, along with 3M's product diversity and markets, means there is no one-solution-fits-all approach for product packaging. Our proprietary Packaging Sustainability Roadmap places a special focus on circular package design, providing a toolkit for our packaging engineers that defines circularity terms and highlights which packaging materials to select for specific outcomes,

such as designing for reusability and recyclability, increasing recycled content, or transitioning to renewable materials. The toolkit includes a Packaging Recyclability Guide, which references global industrial aids and presents them in an easy-to-use format that simplifies selection of recyclable materials.

3M package engineers use this toolkit as a guide to help them make key design decisions that reduce or eliminate packaging where possible and improve our packaging circularity. These efforts have resulted in a weight reduction of 198 metric tonnes of packaging material and the elimination of 104 metric tonnes of virgin fossil-based plastic.

3M has a variety of sustainable packaging solutions, and we are constantly innovating to do more. Our sustainable packaging innovation can be seen across 3M product lines such as the recent redesign of our Command™ Picture Hanging Strips in our North American market. The new packaging replaces the plastic blister packs with paperboard cartons made from 100% recycled fibres with 35%–60% post-consumer recycled content. This eliminated over 43.5 metric tonnes of plastic while improving packaging recyclability.

Product and packaging innovation starts with responsible sourcing, a commitment 3M takes to heart.

### **Forest Product Sourcing**

As a global paper purchaser and sustainability leader, 3M believes we can positively influence practices throughout the forest products supply chain. Our 3M Forest Products Sourcing Policy sets standards of excellence for our suppliers through all tiers of supply.

We expect all forest products from our suppliers to contain materials that are legally harvested, sourced, transported, and exported from their country of origin. In addition, we expect all suppliers to work to ensure that virgin-wood fibre supplied to 3M is traceable, is harvested in a way that maintains or enhances

high conservation values and is free of deforestation.

To support our policy, we partner with Earthworm Foundation, a global nonprofit working with companies, farmers, nongovernmental organizations, and governments to create solutions that serve people and regenerate nature. Along with our partner Earthworm Foundation, we're supporting the Tsay Keh Dene (TKD) First Nation in British Columbia to protect high conservation value forests in their territory. As some of the world's last remaining intact forests, they serve as sources of sustenance, culture, and history for the TKD, as well as critical species habitat and carbon storage.

### **A Sustainable Future**

Looking ahead, we have set ambitious targets to do our part in building a more sustainable future. By 2030, we aim to reduce carbon emissions by 50%, followed by an 80% reduction by 2040, and ultimately striving to be 100% carbon neutral by 2050. Globally, we have invested approximately \$1 billion over 20 years dedicated to achieving carbon neutrality.

We are committed to reducing water use at our facilities by 25% and returning higher quality water to the environment after it is used during our manufacturing processes.

As part of our mission to achieve our sustainability goals, we have also partnered with organizations such as Svante, Carolinian Canada. Through these partnerships, we can leverage each other's strengths and resources to help solve some of the biggest sustainability challenges in Canada and beyond.

3M believes that collaboration can drive us all forward and we remain committed to working with our customers, our suppliers, and our partners to tackle the climate challenges we all face.

*Dr. Marie-Claude Brandys is 3M Canada country governance leader and director of 3M's Area Product Stewardship Centre of Excellence.*



JP Gladu on the Sand Point First Nation with his cousins Josef and Art Gladu. —Courtesy JP Gladu.

# The Indigenous Economy: An Engine of Reconciliation, Growth and Progress

By **JP Gladu**

**E**conomic reconciliation is Canada's competitive edge. That's a bold statement, I know. But as Bob Dylan wrote, "The times they are a changin'", and in no other place in our country do we see immense change the way it's happening in Canada's Indigenous economy.

Our Indigenous economy is opportunity-rich and country-wide. Across Canada, Indigenous communities are increasingly empowered to balance responsible development and protection of our lands. We still have a lot of work ahead of us, but the Indigenous voice is key to unlocking our country's full potential.

Over my career, I have witnessed the power of aligning Indigenous entrepreneurs who are making a difference in their families, communities and regions with corporate business leaders who understand the impact of working with these entrepreneurs.

Consider the Meadow Lake Tribal Council in Saskatchewan, which has been

leading the way in Indigenous forest management for nearly 40 years. As the sole owner of NorSask Forest Products, it is the largest forest products company in Canada owned by First Nations, with over 100 full-time employees. The sawmill operates in the top quartile for quality, productivity and safety and the profits support economic development, social programs, employment and infrastructure in the nine First Nations communities represented by the tribal council. NorSask's high performance has allowed the company to expand and diversify.

The woodland management company, Mistik Management, provides timber and forestry services to its owners: NorSask and Meadow Lake Mechanical Pump. Mistik sustainably manages 1.8 million hectares of boreal forest and has achieved several environmental certifications, including from the Forest Stewardship Council (FSC).

Suncor is another lead Canadian example, committed to equity partnerships with Indigenous communities through honest and respectful relationship-building over recent decades.

It has spent \$15 billion to date on these partnerships — \$3.1B in 2022 alone. That's one company, in one region of Canada. You can see the incredible impact that this has in our nearby communities like Fort McKay — a reminder that the economic horse pulls the social cart. It has played a significant role in helping set the tone for other corporations in Canada to follow suit.

Small and medium enterprises are the backbone of our country, but there is also big business and big infrastructure. The number of Indigenous businesses in this category continues to grow: Companies like the Fort McKay-based Bouchier Group, with 1,300 staff, of which a steady-state 40% are Indigenous; and the Squamish First Nation, with their \$3 billion Sen'ákw development in Vancouver, estimated to generate \$20 billion in cashflow to their nation during the life of that project; or the \$1.12 billion pipeline deal with Enbridge and 23 Indigenous nations. Today, Indigenous nations are the third-largest owner of renewable energy projects across the country.

Don't tell me that we can't have resource development *and* a healthy environment. I live on my Bingwi Neyaashi Anishinaabek/Sand Point First Nation. I've witnessed the leadership over the past 25 years, as we rose from nothing — quite literally nothing because of the forceful removal of our community members and burning of our homes by the provincial government in 1956 to make way for a provincial park. Today, we are a thriving community, with a sawmill producing lumber for the region, bio-gasification and biofuel projects, hydro assets, and tons of mining activity in our region, in which we're now participating rightsholders. Our communities live on pristine, healthy Lake Nipigon, which is the largest lake within the boundaries of Ontario. We have a five-star eco-resort and incredible tourism, with potential for much more.

And we have started to see change in the way we are perceived.

When communities start to see themselves reflected in projects over which they have some environmental oversight rather than change unilaterally imposed from outside, it's much easier to reach the "yes" required for economic development.

This evolution in our own abilities to advance our self-determination and economic prosperity by sustainably developing our lands is largely due to our hard-fought victories in battling for our rights in the courts.

We should be proud and celebrate Indigenous economic success. For too long, we've been on the periphery, on the margins of society in our own lands, and now we are finding our way to the epicentre of both our economy and our country.

Our First Nations across the country are becoming well-acquainted with the business of infrastructure projects. Today, more than 80% of renewable energy projects in Canada have some form of Indigenous ownership or are joint ventures.

Organizations such as the First Nations Major Projects Coalition have been indefatigable champions for change. They've estimated that, over the next decade, 475 natural resource projects

will be developed, representing roughly \$545 billion in capital. More than 80% will be in the energy sector. They currently have 17 projects under their purview representing \$40 billion in capital — with either proposed or confirmed equity stakes.

We are seeing Canadian businesspeople from all sectors, large and small, appreciating the value of Indigenous relationships because it contributes to the economy, to their supply chains, and to their success. And because governments can no longer ignore this proof, we are finally into loan guarantee programs and major equity positions with billions of dollars of work, projects, and ownership.

I have long believed that the federal government could do much more to influence its supply chains. On average, it had spent less than 1% — and some years only 0.3% of its total spend on Indigenous businesses; that number was recently increased to a mandatory minimum Indigenous procurement target of 5% thanks to our lobbying efforts.

Having been barred by the Indian Act and the legacy of colonialism, Indigenous communities have had few options for securing capital and leveraging existing assets as collateral. The extraordinary cost of borrowing creates a barrier to equity investments in these projects, which will grow significantly in the next ten years.

The new Federal Indigenous Loan Guarantee Program announced in the Federal Budget 2024: Fairness to Every Generation promises greater access to affordable capital to help unlock opportunities for equity ownership in natural resource and energy projects. The new program was another hard-fought battle, but it is evidence to government that Indigenous entrepreneurs and nations, small and large businesses, industry and their leadership make a winning combination. While still in its infancy, this access to capital will not just finance our Indigenous future, it will secure our collective future.

Government backed loan and loan guarantee programs continue to play a key role in increasing Indigenous equity participation in projects across industries in Canada. With the support of

current and recently announced programs, we only expect this trend to continue to increase. These include:

- British Columbia's billion-dollar First Nations Equity Financing Framework for projects in the agriculture, aquaculture, tourism and natural resource sectors.
- Alberta Indigenous Opportunities Corporation is using up to \$3B in loan guarantees to transform ideas and innovation into action.
- The Saskatchewan Indigenous Investment Finance Corporation provides loan guarantees to support Indigenous equity participation in major projects in the natural resource and value-added agriculture sectors.
- The Ontario Aboriginal Loan Guarantee Program, launched in 2009, supports Indigenous equity participation in electricity infrastructure projects. Indigenous nations are key to unlocking Canada's full potential and to put us back in a position where we are in the top quartile within the OECD standings.

We must stop looking at economic reconciliation only as a long-overdue moral imperative. We must also look at it as our competitive edge. When our communities lead Environmental Assessments (EAs), it helps us get through the regulatory processes quicker. When we empower the Indigenous workforce, we create certainty for companies as they move into the future. And when we capitalize our communities to participate in equity projects, that form of consent strengthens reconciliation.

Government, industry, and society cannot choose which rights they support for Indigenous Peoples. If you support our rights, then you support our right to self-determination and our interests in advancing our economies in our territories.

The times certainly are changing. Which side of progress do you want to be on?

*JP Gladu is founder and principal of Mokwateh, an economic reconciliation consultancy. He is past president of the Canadian Council of Aboriginal Business (CCAB) and a senior fellow with the Macdonald-Laurier Institute.*



*In Canada, planting is an important tool for ensuring that forests sustain a myriad of different values, writes Alice Palmer. —Adobe*

# Can We Plant Trees and Maintain Forest Biodiversity?

**By Dr. Alice Palmer**

**F**orests are integral to biodiversity, global carbon balance, and human well-being. This makes deforestation (the conversion of forested land to other uses) and forest degradation (the reduction of a forest's ability to provide the same environmental and/or economic value that it once did) major global environmental issues. When forestland is cleared permanently for agriculture, grazing, or urbanization, its carbon is released into the atmosphere and the land's carbon-sequestration potential ceases. The Food and Agriculture Organization of the United Nations (UNFAO) estimates that 11% of global carbon emissions are caused by deforestation and forest degradation.

The European Union's new Regulation on Deforestation-free Products (EUDR) strives to end global deforestation. As its name would suggest, the EUDR is designed to ensure products entering the EU, including forest products, soy, palm oil, cocoa, coffee, beef and rubber, and their derivatives, have not contributed to deforestation or forest degrada-

tion. As of December 30, 2024, all shipments of these products in the EU must be accompanied by a due diligence statement and detailed geolocation references, showing where the products originated. Palm oil and rubber producers in Southeast Asia, beef and soybean growers in Latin America and Australia, and coffee and cocoa farmers in Africa will all be affected.

Canadian farmers and forest products companies will be affected too. The good news is that Canada is almost deforestation-free: annually, less than 0.02% of Canadian forests are converted to other uses. Further, our forestry regulations are among the most stringent in the world. Less than 0.5% of our forests are logged each year, and logged areas are promptly reforested. However, this does not mean we are off the hook.

## **Two Planting Perspectives**

Ironically, Canada's tradition of prompt reforestation runs contrary to the EUDR rules – at least at first glance. Article seven of the EUDR defines forest degradation as: “The conversion of pri-

mary forests or naturally regenerating forests into plantation forests or into other wooded land, or primary forests into planted forests.”

In other words, forest management that reduces a forest's degree of naturalness beyond a prescribed limit is considered to be degradation. According to the EUDR, it's okay to convert a primary forest (i.e., a forest that has no “clearly visible indications of human activities”) into a naturally regenerated forest, but not okay to convert it into a planted forest. Further, it's okay to turn a naturally regenerating forest into a planted forest, but forbidden to turn it into an intensively-managed forest plantation.

From a European perspective, this makes sense. Europe is much more densely populated than Canada, and many European forests were in fact re-established in the late 19th and 20th centuries after being heavily over-exploited by previous generations. Not all of the trees planted were native to Europe. Indeed, Sitka spruce – native to the west coast of North America – was planted throughout much of Northern Europe. In Europe, “plant-

ed forests” can indeed be quite different from “naturally regenerating forests.”

From a Canadian perspective, however, the EUDR definitions seem both arbitrary and confusing. Why? Because there is really no difference between a “naturally regenerated forest” and a “planted forest” in Canada. In contrast with the forest practices of some parts of Europe (and many other parts of the world), we don’t plant non-native species here. After logging, we reforest with the same tree species that were there before.

Fortunately for Canada, the EUDR’s definition of “naturally regenerated forests” does allow some leeway for planting. The EUDR includes “forests for which it is not possible to determine whether planted or naturally regenerated” in its definition of “naturally regenerated forests.” Most (if not all) Canadian second- growth forests would meet this criterion.

Will these arguments be enough to convince European policy makers that Canadian forestry practices do not represent a conversion from “natural” to “unnatural?” One can only hope.

### Why Do We Replant?

If the EUDR policies threaten to brand tree planting as “degradation,” why not just let our forests regenerate naturally? Although planting is common in Canada, it isn’t 100% necessary. In nature, if a forest burns down, blows down, or gets eaten by insects, it usually grows back on its own. In the newly established sunlight, pre-existing seeds will sprout, and new seeds will blow in from adjacent forests. With less overhead competition, surviving understory trees (the vegetation that grows between the forest canopy and the forest floor) “release” and grow more quickly.

However, the process of natural regeneration can take a long time. Often, the first species to establish themselves after a disturbance are what is known as “pioneer” or “early seral” species: sun-loving species including grasses, shrubs, and rapid-growing (yet less commercially valuable) trees such as alder and aspen. These pioneer species can initially out-compete the slower-growing “climax” species

that existed in the forest before the disturbance. Also, if dense brush prevents trees from getting established, there can be gaps in the tree cover.

The benefit of planting versus waiting for natural regeneration is that planting speeds up forest reestablishment and ensures that harder-to-reestablish species are included in the mix. While this is obviously advantageous from a commercial perspective, planting also ensures that other forest benefits such as carbon sequestration and soil stabilization occur more quickly.

### The Science of Reforestation

In Canada, we typically aim to re-grow the tree species that were on the ground before an area was logged. Prior to logging, the site is surveyed, and a detailed reforestation plan is created, based on the site conditions and the existing tree species.

Foresters also recognize that naturally-regenerated trees often join those that were planted. Some species regenerate so abundantly that foresters often leave them out of their planting prescriptions, even though they anticipate the species will dominate the mature forest. For example, in forest openings on the west coast, it doesn’t take long before a thick, green carpet of western hemlock seedlings covers the forest floor. So, even if only a single species is planted, the second-growth forest will often contain more.

When foresters opt to re-plant a forest, the seedlings come from local nurseries, using seed cones harvested from local forests. This is important, as trees are genetically adapted to their own latitude.

### Reforestation and Climate

As the world warms, Canada’s forests are becoming increasingly prone to drought, insects, and wildfire. This presents both a challenge and an opportunity for our reforestation programs.

If an area becomes warmer and drier, an individual tree can’t pack up and move north. However, whole forests can adapt over time: trees that are genetically better adapted to the new conditions thrive, and ones that are less adapted die out.

Unfortunately, this process is very slow. If the climate warms rapidly, our forests may struggle to adapt fast enough, and forest health may suffer.

Selecting seed cones from sites slightly further south than where the seedlings will be planted can help forests adapt to climate change. Research into this practice is ongoing.

Another issue affecting Canadian reforestation practices is wildfire mitigation. In recent years, we have seen an increase in extreme wildfire behaviour in Canada. With climate change occurring, this pattern is likely to continue – necessitating a change in forestry practices.

Since we primarily log conifer species in most of Canada, these are the species we typically aim to have in our second-growth forests. However, hardwood species such as aspen are less flammable than softwoods. When out-of-control wildfires are racing across the landscape, they tend to slow down when they hit hardwood stands. Therefore, adding “firebreaks” of hardwoods onto the landscape is becoming an increasingly important wildfire mitigation strategy.

### Sustainable and Strategic

Does replanting a forest really cause degradation, or in other words, reduce a forest’s ability to sustain ecological and economic benefits? In Europe, in the past, perhaps it did. Foresters in the 1800s and 1900s may not have considered the wide range of ecological values that we do today.

Today in Canada, however, planting is an important tool for ensuring that forests do sustain a myriad of different values. Not only does planting ensure sustainable timber production in the future, it also contributes to biodiversity, carbon sequestration, and soil stability – among other things. Furthermore, it can be a useful strategic tool for helping forests adapt to climate change.

Canadians love our forests. Therefore, sustainable forest management, including tree planting, is important to us too.

*Dr. Alice Palmer is a forest industry consultant based in Richmond, BC. Follow her blog, [Sustainable Forests, Resilient Industry](#), at [alicepalmer.substack.com](#).*



*Between 2013 and 2022, Canada's share of global softwood lumber production declined from 13% to 10% by volume, writes Heather Exner-Pirot. —Tiffany Christianson Photography*

# Canada's Forest Sector: Born on Third Base, Hampered by Policy

**By Dr. Heather Exner-Pirot**

Canadian policy debates have become locked in a perceived dichotomy between acting on the climate and growing a strong economy. Winners and losers, trade-offs and costs seem to appear at every corner. But there's one sector in Canada that can uncompromisingly advance emissions reductions goals while thriving economically: the forestry industry. Unfortunately, benign neglect of Canada's world-leading forest resources has left a lot of opportunity on the table. It's time to start capitalizing on it.

Stacked up beside Canada's enormous energy and mining sectors, the forestry industry may not loom large in

Bank of Canada updates or major bank analyses. But it is a significant part of the Canadian economy by any metric. In 2022, the sector generated nominal GDP of \$33.4 billion, exports of \$45.5 billion, and employed over 212,000 people, of whom 11,000 were Indigenous. Forestry contributes to Canada's trade balance, with a \$32 billion surplus, and is a key source of income and employment for about 300 communities in every province except PEI. Areas of historical strength include, yes, 70% of the world's maple syrup production, which has been growing steadily and hit over \$600 million in exports in 2022; as well as world-leading exports of softwood lumber, newsprint, and pulp products.

The enormity of Canada's forest resource is hard to overstate. We have 234.5 million hectares of commercial forests, of which only 0.4% is harvested each year. Unlike other jurisdictions globally, deforestation (the permanent clearing of forest to make way for non-forest use) is a minor issue here, accounting for only 0.02% of our forest. We account for only a third of a percentage point of global deforestation despite having almost a tenth of the world's forests.

## **Quantity and Quality**

Canada also has 35% of the world's certified forest area, a term to describe third-party sustainable management standards. Increasingly, these are ad-

ministered by Indigenous Peoples, whose management of forest resources has increased 135% since 2003. Canada competes on both quantity and quality.

Yet despite the big numbers, and a highly profitable 2021 thanks to a COVID-era construction and renovation boom, the Canadian forestry sector has spent much of the 21st century on the back foot. The softwood lumber disputes, pine beetle and other infestations, wildfires, and regulatory burdens have all diminished the sector's ability to compete and grow. While the value of Canada's forest sector is still increasing, our production volumes and global market share are in decline. Between 2013 and 2022, Canada's share of global softwood lumber production declined from 13% to 10% by volume. Canada's share of global wood pulp production (mechanical, semi-mechanical, and chemical) declined from 10% to 4% over the same period.

This is not due to a lack of demand but rather a lack of vision. As an economic sector, forestry is not a 19th or 20th century phenomenon. It is foundational to construction and housing, and a solution to many of our low-emissions material needs. Other nations have thriving forest sectors, even as ours slowly diminishes. A key difference is a lack of policy support. In Canada, the forestry sector is the victim of, at best, inattention, and at worst, obstruction.

### **Management, Markets and Access**

What could an ambitious Canadian forestry strategy produce? How could we leverage our enormous and unique resource to address Canadians' economic and environmental needs? There are three areas primed for action.

The first is using active forestry management practices to address wildfire risk while providing new feedstock for forest products. Increased wildfires may be an inevitable consequence of climate change, but we are not helpless to mitigate their impacts. Strategically thinning forests and reducing fuel loads reduces wildfire risk

and severity. This can be made more economical by using low-value residual fibre to feed into bioproducts and bioenergy, such as forest biomass-derived heat and electricity. We should be incentivizing investment and demand for these sectors as part of our wildfire mitigation response.

The second is to strategically develop both markets and supply chains for mass timber. Engineered, or mass, timber products are thick, compressed layers of wood that can be used as structural load-bearing elements. This allows them to displace carbon-intensive products such as steel and concrete. Using wood products in construction not only displaces emissions but actually acts as storage, reducing embodied carbon in buildings by as much as 40%.

To take advantage of the opportunity and grow global market share, Canada should develop local supply chains and standardize building archetypes, connectors and specifications. This has the added bonus of reducing costs and time of construction as we work to increase housing supply. The application of mass timber should be expanded as well: Ontario announced in April it would allow mass timber construction for 18-storey buildings, up from the previous twelve. Other provinces should follow suit.

The third is to implement policies that provide reliable access to timber resources. Canadian companies perennially fall short of their full Annual Allowable Cut (AAC) – the amount of timber that can be harvested sustainably as determined by each province – partly because there is tremendous difficulty in accessing the permits. The area harvested in Canada has dropped by about 14% since 2016. The gap between harvest and AAC should be reduced.

BC is a worst-case scenario. Despite the province's incredible resource, weak policy, slow permitting, and activism has led to mill closures, curtailments, and the loss of thousands of jobs just in the past year. It is almost inconceivable to think that the Canadian forestry sector is hampered

by a lack of access to timber supply. Our peer jurisdictions in the United States, Sweden and Finland harvest far greater proportions of their commercial forests each year, in a broadly sustainable way.

### **A Question of Leadership**

There are opportunity costs of letting our global forestry market share continue to decline. One is that it reduces options for builders at home and around the world to choose renewable wood products over higher-emitting steel and concrete. North America is currently producing a fraction of the CLT (cross-laminated timber) that Europe produces, despite our higher population growth and access to Asian markets.

It further limits economic opportunities for the many Indigenous communities that rely on forestry. There are already about 1,400 Indigenous-owned businesses in the forestry sector. New markets, opportunities and products can expand these businesses and help communities move through the value chain to milling and manufacturing.

Maximizing our potential will require policy leadership. The sector is served by a handful of industry associations and the Canadian Council of Forest Ministers, whose secretariat is provided by Natural Resources Canada's Canadian Forest Service. But it is still lacking a coordinated national strategy that looks not only at environmental management, climate adaptation and Indigenous reconciliation, but at economic competitiveness and industry innovation as well.

Canada was born on third base; an immensely endowed nation with world-class supplies of almost every conceivable resource. When it comes to the potential of our forest sector, we have not been able to see the wood for the trees. Let's not wait any longer to develop a coordinated forestry strategy that will make us a global leader once more.

*Dr. Heather Exner-Pirot is director of Energy, Natural Resources and Environment for the Macdonald-Laurier Institute and special advisor to the Business Council of Canada.*



*What would a Canadian industrial policy for forestry look like? —Adobe*

# Canada's Industrial Policies Need a Forestry Branch

**By Eric Miller**

Countries in every region of the world are seeking to grow their economies and drive innovation. As part of this process, they are looking to capture greater value from sectors where they have a natural comparative advantage.

These objectives are increasingly spelled out by governments in the form of industrial strategies; instruments that offer a clear set of policies governments use to promote and drive value in certain sectors of the economy. When done properly, they are vital instruments for driving economic prosperity.

Canada has recognized that it needs plans for managing and growing key sectors. This is why the federal government has strategic plans for the critical mineral and electric vehicle sectors.

Both sectors anchor regional economies and are fundamental to the energy transition. The other big sector that meets both the economic and climate objectives is forestry.

It is therefore imperative that Canada develop an industrial strategy for the forestry sector. Wood, pulp, and paper manufacturing represents about 9% of Canada's total factory sales, making it one of the largest industrial sectors in the country. Last year alone,

the outputs of the Canadian forest sector reached \$73 billion. It employs more than 200,000 Canadians across hundreds of rural and northern communities.

An industrial strategy designed to grow the forestry sector and make it more innovative could play a significant role in pushing out the prosperity of Canadian life to the many villages and hamlets that too often feel ignored. Moreover, a well-designed strategy would see government action to address climate change become synonymous in forestry communities not with escalating costs, but with new jobs and greater fire resilience.



To be clear, calling for a forestry industrial strategy isn't a call for bigger government intervention or large handouts to corporations. In fact, it's quite the opposite.

So, what would a Canadian industrial policy for forestry look like?

Practical industrial policies require governments to get the small things right – ensuring policies don't operate at cross purposes and that there is consistency and line of sight from one government department to the next. These policies should also strengthen infrastructure to incentivize private sector investment and engage global stakeholders to recognize the positive externalities businesses provide to their communities.

Practical industrial policies should recognize the interconnectedness of global challenges – from technological disruption to climate change to pandemics – and they require proactive, coordinated responses that transcend ideological divides.

Of course, businesses already navigate a complex web of policies, often shaped in ways that negatively impact their trajectory. We need to think integrally about how everything fits together and ensure our policies support all critical industries, not just the ones grabbing the latest headlines.

To realize the full potential of the sector, an industrial policy for Canadian forestry should include:

- **Investment Tax Credits (ITCs):** Implement ITCs specifically to incentivize the creation and use of biomass for heat and electricity, as announced in the 2023 Fall Economic Statement. Effective implementation is crucial to ensure these credits stimulate investment in sustainable biomass energy solutions.
- **Mass Timber and Primary Wood Products:** Promote mass timber construction to enhance the built environment. This involves increasing height allowances in the National Building Code from 12 to 18 storeys, enabling more low-carbon, affordable housing.

- **Regulatory Harmonization:** Harmonize regulatory frameworks and streamline permitting processes to reduce bureaucratic hurdles. This will facilitate faster project approvals and provide greater certainty for businesses in the forestry sector.

- **Wildfire Mitigation:** Eliminate regulatory barriers to active fire mitigation and prevention, with targeted financial support for regional, land-based decision-making. Encourage collaboration between industry and Indigenous Peoples on climate-smart forestry practices.

- **Community Infrastructure:** Invest in infrastructure in rural and northern areas to make these communities more livable and attractive to skilled workers, and to support the efficient transport of forestry products.

- **Workforce Supports:** Identify existing and to-be-created educational pathways that provide workers with the skills and practical experience needed to meet industry transformation objectives, to facilitate the design and development of emergent technologies, manufacturing processes, and downstream product applications.

- **Global Advocacy:** Enhance government efforts to defend Canada's forestry interests globally, countering misinformation about the sector that puts Canadian jobs at risk, and addressing protectionist legislation in other markets that threatens the sector's ability to compete globally.

In addition to these elements, the Canadian forestry industrial strategy needs to include an export component. For the foreseeable future, Canadian softwood lumber seems destined to be subject to U.S. protectionist tariffs. One important way around this is to develop new markets for valued-added forest products.

One of the most important global trends in housing is the rise of modu-

lar construction. In essence, chunks of houses are pre-made in a factory and then put together at the building site like a Lego kit. This is not only cheaper than classic site-built construction but requires fewer people to execute.

Considering that Sears sold kit houses to build communities across North America a hundred years ago and leading builders sold kit skyscrapers across the world at the beginning of the 20th Century, it should be possible to export Canadian-made wooden modular buildings. Moreover, once the infrastructure is in place, these buildings can be widely sold domestically and play a key role in solving Canada's housing crisis.

Canada is hardly the only country facing a housing shortage. If it mobilizes the right collection of players, modular buildings can become a key Canadian forest product.

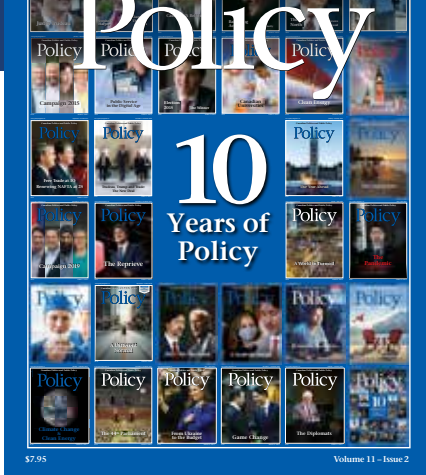
By thinking creatively and incorporating these and other elements, a forest sector industrial strategy can provide a comprehensive and coherent framework that ensures the long-term sustainability and competitiveness of Canada's forestry sector.

Government support for forest-based solutions to Canada's environmental, economic, and social challenges can simultaneously increase affordability, safety, and prosperity for everyday taxpayers across the country.

We know that our collective strength as a nation depends not only on managing our natural landscape responsibly, but also in how we build a cohesive policy environment that enables Canadian workers and businesses alike to achieve shared goals.

It's time to take a pragmatic approach that supports both established and emerging sectors to keep pace and remain competitive, or face the consequences of falling behind.

*Eric Miller is president of Rideau Potomac Strategy Group, global fellow at the Canada Institute of the Woodrow Wilson Center in Washington, and a fellow with the Canadian Global Affairs Institute.*



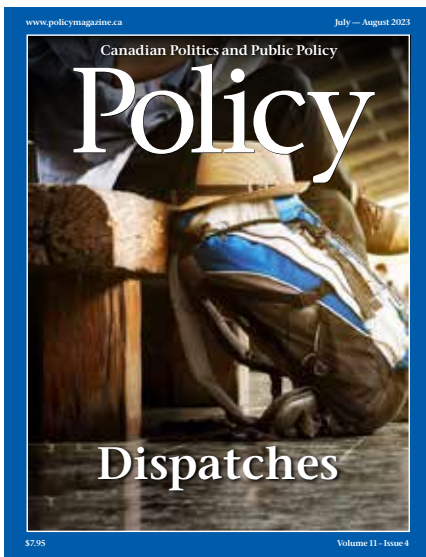
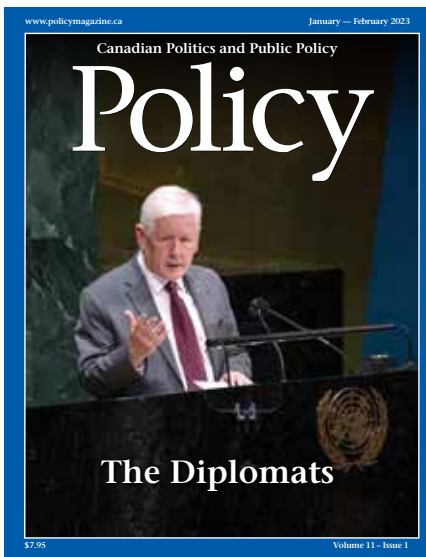
Canadian Politics and Public Policy

# Policy

Reach the People Who Make the Policy

After a decade of trusted excellence in insight and analysis written by and for policy and political professionals, *Policy Magazine* has shifted to online-only at [policymagazine.ca](http://policymagazine.ca) and *The Week in Policy*.

We continue to publish thematic print issues for clients by special request.



For further information about thematic print issues and sponsorship opportunities at Policy Online or in The Week in Policy, please contact Lisa Van Dusen at [lvandusen@policymagazine.ca](mailto:lvandusen@policymagazine.ca)

# Policy

# Recognizing Excellence in Forestry

## 2024 FPAC Awards of Excellence



The Honourable  
Percy Mockler



The Honourable  
Candice Bergen



Chief Paul Gladu

### JIM CARR FOREST COMMUNITY CHAMPION AWARD RECIPIENTS

The Transition  
Accelerator



L'Accélérateur  
de transition

The Transition Accelerator Team

### PARTNERSHIP AWARD

#### Jim Carr Forest Community Champion Award

This esteemed award is named in honour of the late Jim Carr, an incredible champion of Canadian forestry and forestry workers who served as Canada's Natural Resources Minister from 2015-2018. The award recognizes individuals who have showcased exceptional dedication to their communities and have contributed to advancing the environmental, social, and economic benefits of the forest sector in Canada.

#### Partnership Award

This award recognizes important collaborations that advance the environmental, social, and economic benefits of sustainable Canadian forestry. Past winners include Ducks Unlimited Canada, the Outland Youth Employment Program (OYEP), and Indigenous Resource Network (IRN).

Canada's forest products sector is dedicated to clean and sustainable practices that safeguard the environment and deliver high-quality lumber, paper, and wood-based bio-products to Canadians.

Learn more about Canadian Forestry and how its contributing to our country's economic and environmental goals.



FPAC.ca  
APFC.ca

As an industry with annual economic outputs of \$97-billion, Canada's forest products sector is one of the country's largest employers operating in hundreds of communities, providing 200,000 direct jobs and over 370,000 indirect jobs across the country.



# Resilience in the face of climate challenges.

TELUS has invested \$125 million over the last five years to keep communities safe, connected, informed and supported during escalating climate emergencies.

As Canada faces another potentially devastating wildfire season, we're proactively strengthening our existing networks and deploying generators and solar-powered cell towers to ensure high-risk communities stay connected.

Looking forward, we're investing in innovative technology solutions that aim to reduce the impacts of climate change through remote detection of wildfires, enhanced wildfire safety response and reforestation.

You can learn more about our efforts to protect the places we call home by visiting [telus.com/WildfireRelief](https://telus.com/WildfireRelief).

Together, let's make the future friendly.