DEMONSTRATING THAT ELECTRICITY PRODUCTION FROM SOLID BIOMASS IS BOTH LOW-CARBON AND SUSTAINABLE

Cofiring Biomass with Coal Workshop | Kokura Japan | February 26, 2020

Gordon Murray, Executive Director

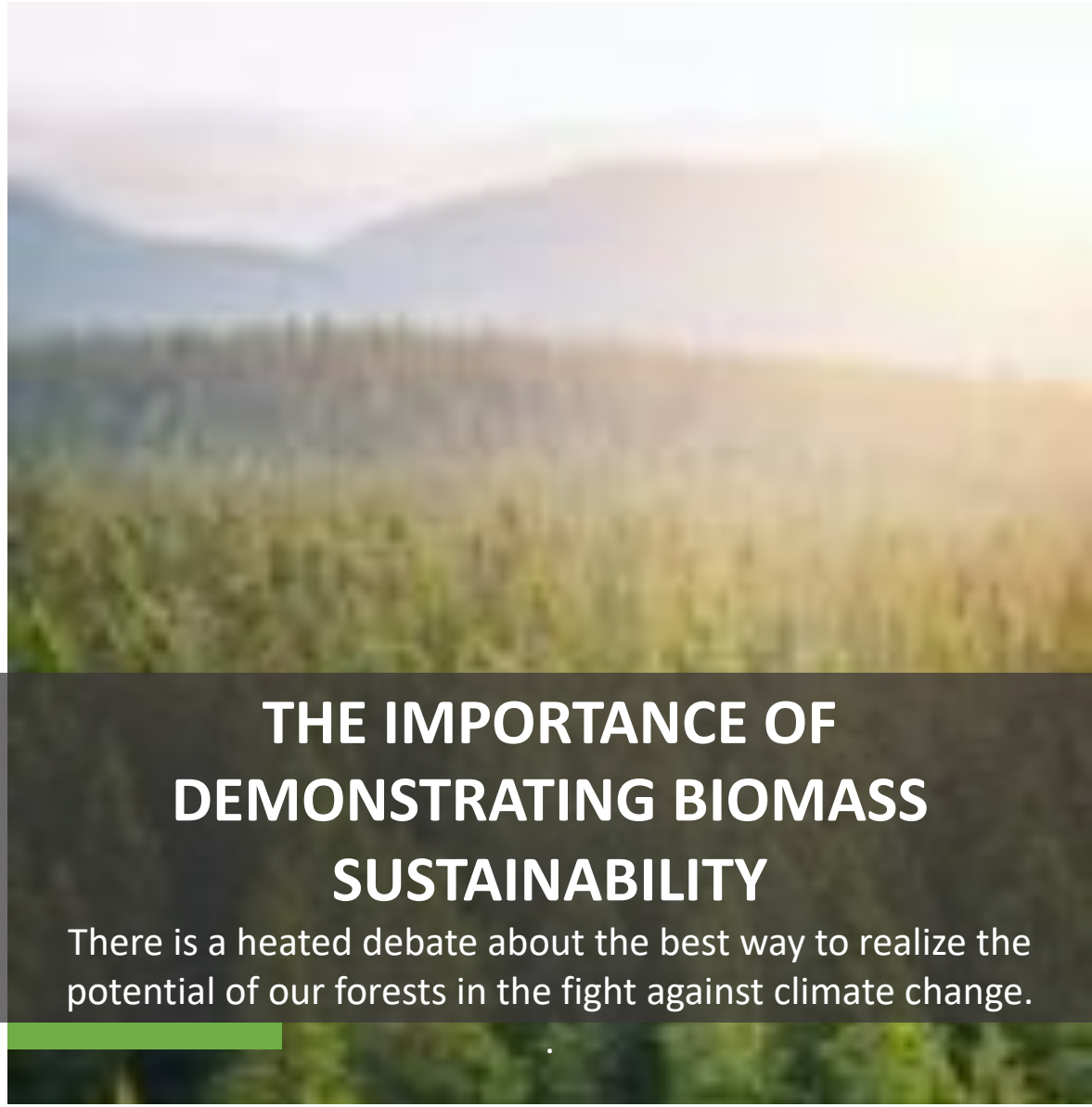
WOOD PELLET
ASSOCIATION OF CANADA

Harvesting forest biomass for electricity production must be done in a way that protects ecosystems, reduces greenhouse gas emissions and creates socio-economic benefits.

Some express concern that the wood demand for bioenergy may rise enormously, threatening the existence of forests

In an era of cheap coal, government policy support is needed to make biomass electricity generation economically feasible.

Governments require biomass fuels to be produced sustainably and significant GHG reductions to be demonstrated.



THE IMPORTANCE OF DEMONSTRATING BIOMASS SUSTAINABILITY

There is a heated debate about the best way to realize the potential of our forests in the fight against climate change.

BIOMASS OPPOSITION FROM ACTIVIST NGOs

WHAT DO THEY SAY ABOUT FOREST-DERIVED BIO-ELECTRICITY?

"Biomass is dirtier than coal"

"Biomass increases atmospheric CO2 which takes centuries to repay"

"We are vaporizing forests to burn for electricity"

"Wood demand for bioenergy may rise enormously, threatening the existence of forests"

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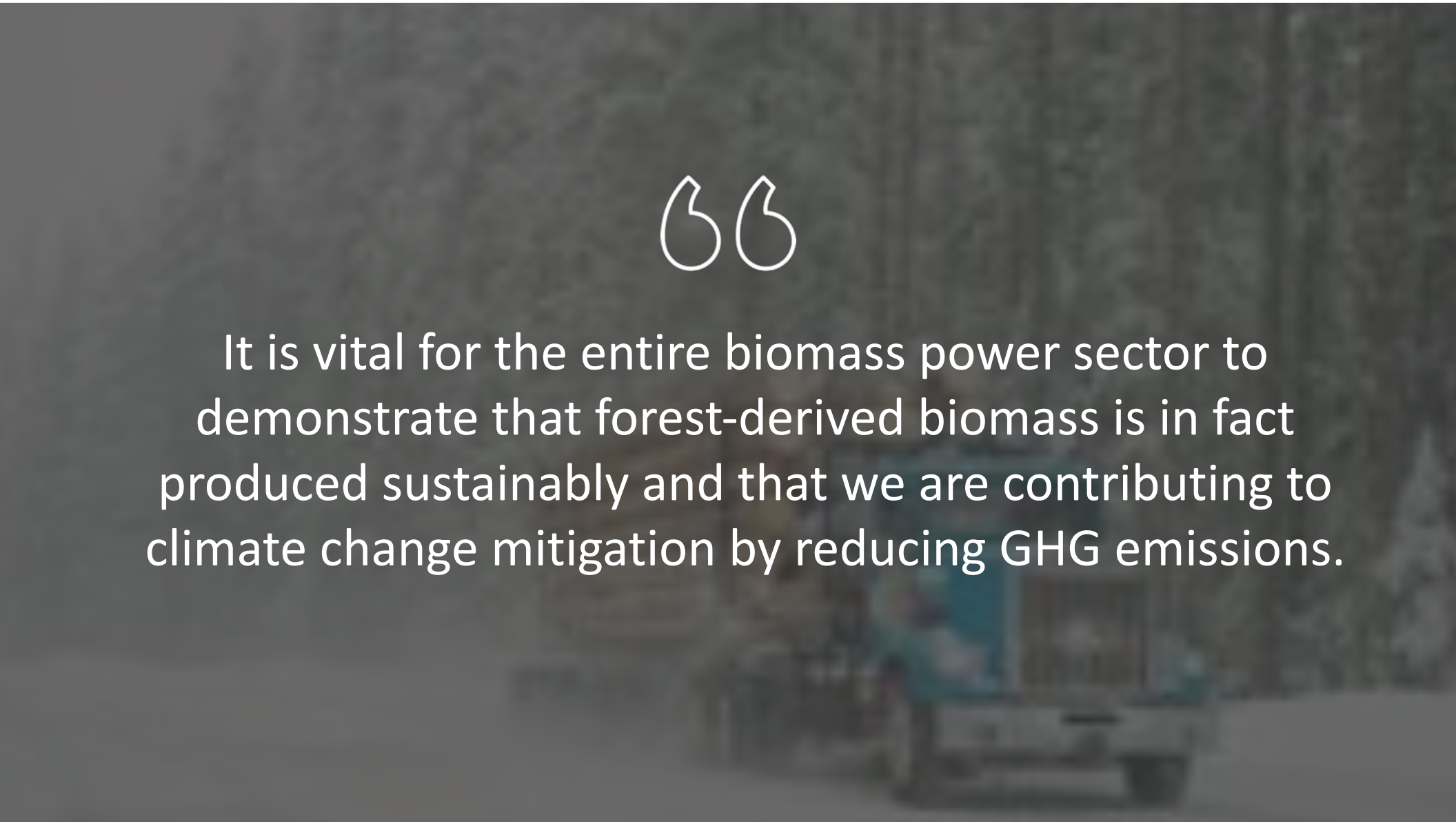
It is vital for the entire biomass power sector to demonstrate that forest-derived biomass is in fact produced sustainably and that we are contributing to climate change mitigation by reducing GHG emissions.

HOW DO WE DEFINE FOREST SUSTAINABILITY?

INTERNATIONAL AGREEMENTS: MONTREAL PROCESS AND FOREST EUROPE

- Maintenance of forest contribution to global carbon cycles
- Maintenance of forest ecosystem health and vitality
- Maintenance of productive capacity of forest ecosystems
- Conservation of biological diversity
- Conservation and maintenance of soil and water resources
- Maintenance of other socio-economic functions and conditions

Forest Europe growing life

The Montréal Process
Criteria and Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests

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OTHER FOREST SUSTAINABILITY DEFINITIONS

- National Standards in the UK, Netherlands, Belgium and Denmark
- European Renewable Energy Directive – (RED II)
- Third party certification programs – FSC, PEFC, and SBP

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1. Disallow biomass leading to deforestation.
2. Favour biomass associated with afforestation.
3. Favour biomass associated with conserving and enhancing growing stock and forest productivity.
4. Disfavour biomass from forests with low growth rates.
5. Favour biomass where harvest levels are consistent historic levels.
6. Aim for biomass use that is within the long-term sustainable-yield capacity of the supplying forest.
7. Disfavour forest biomass from stumps and roots.
8. Favour biomass from post-consumer waste wood

"GOOD AND BAD BIOMASS" AS RECOMMENDED BY FOREST RESEARCH, UK

"A practical set of criteria to ensure that bio feedstocks used will meet EU bioenergy goals and deliver GHG reductions"

9. Favour biomass from industrial residues.
10. Favour biomass from fast-decaying forest residues.
11. Favour biomass from salvage logging.
12. Restrict biomass from whole tree stems to small/early thinnings.
13. Favour biomass from small roundwood.
14. Disfavour from wood feedstocks suitable for saw-timber.
15. Favour biomass as a by-product of wood harvesting.

"GOOD AND BAD BIOMASS" AS RECOMMENDED BY FOREST RESEARCH, UK

"A practical set of criteria to ensure that bio feedstocks used will meet EU bioenergy goals and deliver GHG reductions"

THE CARBON CYCLE

"While more CO2 is released per unit energy from biomass than from coal – this is purely a consequence of the chemical composition of biomass and coal. There is a fundamental difference between energy supply from fossil fuels and from biomass: burning fossil fuels releases carbon that has been locked up in the ground for millions of years, while burning biomass emits carbon that is part of the biogenic carbon cycle. In other words, fossil fuel use increases the total amount of carbon in the biosphere- atmosphere system while bioenergy systems operates within this system; biomass combustion simply returns to the atmosphere the carbon that was absorbed as the plants grew."

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FOREST CARBON FACTS

- IPCC: cumulative emissions of CO_2 will largely determine global warming by the late 21st century and beyond.
- IPCC: emissions of biogenic CO_2 from the combustion of biomass are reported as zero emissions within the energy sector.
- The exact timing of CO_2 emissions is less important than how much carbon is emitted in total in the long run.
- The most common timeframe for measuring the impacts of greenhouse gases is 100 years. Measuring the net cumulative carbon emissions from forest biomass energy over a 100 year timeframe, as is done for fossil fuels, most accurately demonstrates the cumulative carbon benefits of biomass energy compared to fossil fuels.

FOREST CARBON FACTS

- One of the criticisms against forest bioenergy is that a tree stops growing and accumulating carbon when it is cut, and the carbon stock in a single stand decreases at harvest. But this perspective ignores sustainable forest management, which is coordinated across the whole landscape to maintain forest growth and obtain a continuous flow of wood for the forest industry.
- If the annual cut is equal to the annual growth, at estate level, the carbon stock of the whole forest will remain constant. If the annual cut is less than the annual growth, the forest will have a net sequestration of carbon, while also providing wood for products and biomass for energy.
- In the absence of management, forest growth rates decline, and disturbance risks increase.

- Demand for forest products – including bioenergy products – stimulates and provides income for active forest management that promotes regeneration, enhances growth and helps protect forests against disturbances, such as fires.
- Bioenergy is typically a side-product of forest harvesting and wood processing, and sustainable forest management principles provide safeguards against overharvesting.
- Impacts of bioenergy are commonly quantified by comparing to a reference “no-bioenergy” scenario. In most cases, it is not plausible to suggest that the forest would remain unharvested and continue to grow in the reference scenario as extraction of biomass for bioenergy is not the main economic driver to harvest the forest.

FOREST CARBON FACTS

- The mitigation value of unharvested forests is uncertain due to the potential for fires, storms, droughts and insect attack.
- Managed forests continue to accrue climate benefits by providing bioenergy feedstocks to displace fossil fuels, and wood products which substitute for GHG-intensive building products, so that over multiple cycles of forest harvest and regrowth the climate change mitigation value of forests sustainably managed for production of timber and bioenergy is greater than the mitigation value of unharvested forests.

FOREST CARBON FACTS

FOREST CARBON FACTS

- Forest bioenergy is usually part of a larger value chain that includes sawnwood, pulp, paper, and chemicals. Hence, drawing general conclusions on which woody biomass feedstocks to support, and which not, based on a very limited analysis of individual forest bioenergy systems is inappropriate and unjustified.
- Studies show that fossil fuel used for harvesting, chipping and transportation, even over very long distances, typically corresponds to less than 10% of the energy content in the supplied biomass, meaning that supply chain emissions are of minor importance.
- Energy from woody biomass can be very positive for the climate, particularly when applying sustainable forest management practices, and when the biomass is used efficiently (such as in CHP).

THIRD PARTY CERTIFICATION

FSC

FOREST-ONLY CERTIFICATION AT FOREST LEVEL & CHAIN OF CUSTODY

PEFC™

FOREST-ONLY CERTIFICATION AT FOREST LEVEL & CHAIN OF CUSTODY

SBP
Sustainable Biomass Program

RISK-BASED CERTIFICATION AT THE BIOMASS PLANT LEVEL, INCLUDES GHG ANALYSIS

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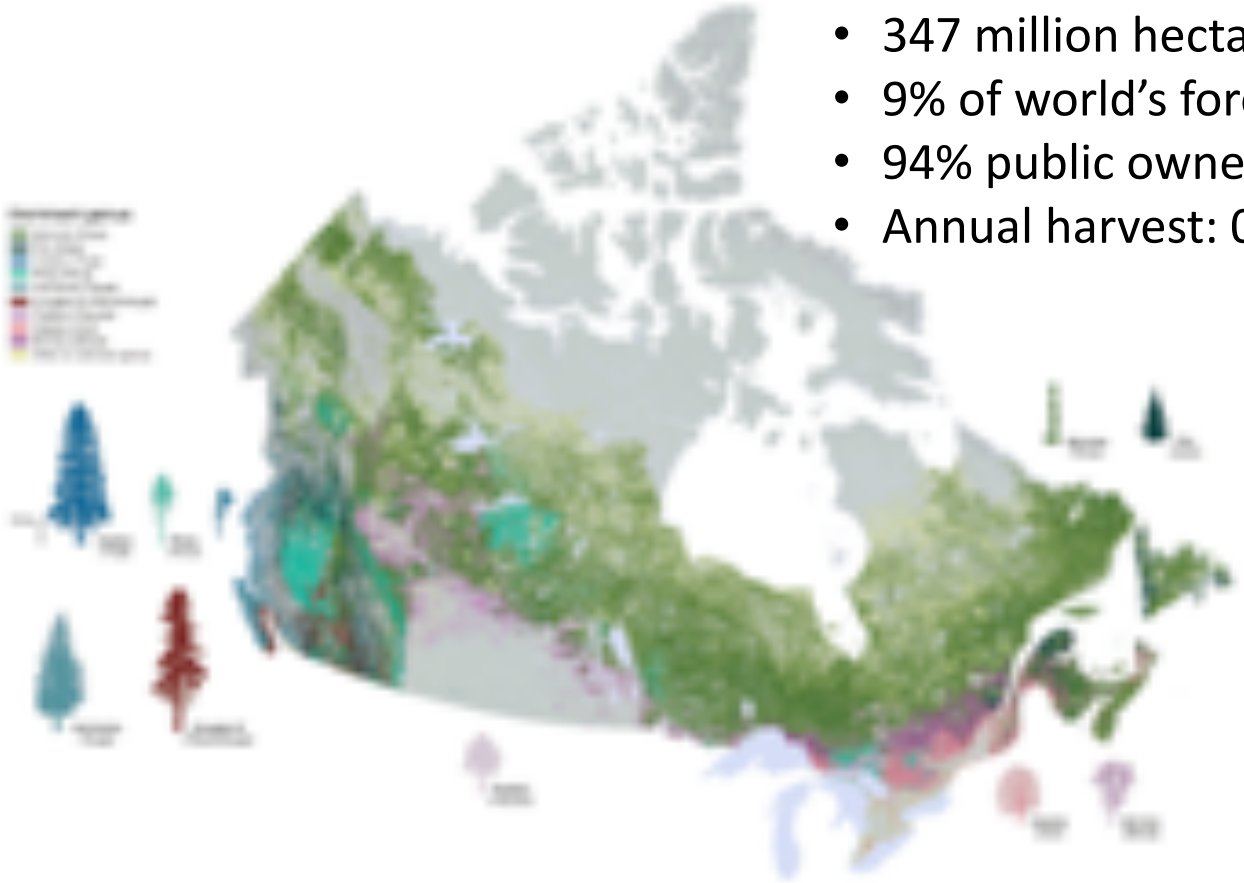
CASE STUDY - CANADA



- 347 million hectares
- 9% of world's forests
- 94% public ownership
- Annual harvest: 0.3%

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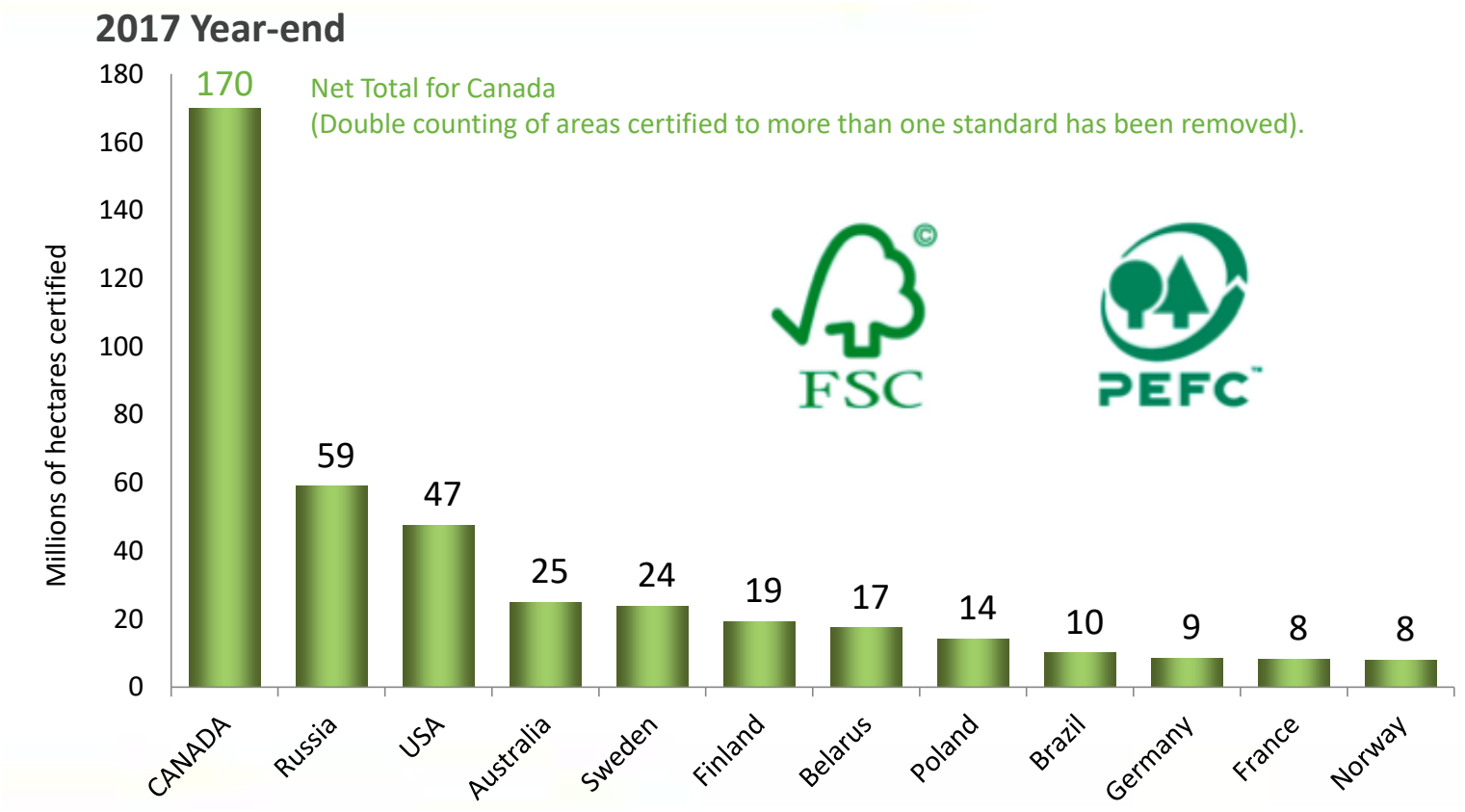
CANADA LEADS ALL COUNTRIES IN CERTIFIED FOREST AREA



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ALL CANADIAN WOOD PELLET EXPORTERS ARE SBP CERTIFIED

SBP
Sustainable Biomass Program

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BIOMASS FEEDSTOCK IS A BYPRODUCT OF THE LUMBER INDUSTRY

Sawmill residues

Logging residues

Low grade logs

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BUSH GRINDING HARVEST RESIDUALS

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UNLOADING AT THE PELLET PLANT

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CANADA'S WOOD PELLET SECTOR WITHIN CANADA'S FOREST INDUSTRY

- Annual log harvest ~ 130 million tonnes
- Fibre used for pellets ~ 6 million tonnes (4%)
- Annual forest products revenue: $65 bn
- Annual revenue from pellets: $0.6 bn (0.9%)


Canadian wood pellet producers are committed to demonstrating that we produce wood pellets to the highest standards of sustainability and that our pellets are contributing to climate change mitigation by reducing GHG emissions. .

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