BRITISH
COLUMBIA
WOOD PELLETS

SUSTAINABILITY FACT SHEET
What Makes a Sustainable Biomass Supply?

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II. Feedstock Sourced Primarily from Industrial Residues

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Summary
HIGHLIGHTS

• British Columbia, Canada is a key supply region for high quality biomass wood pellets derived from byproducts of a globally recognized sustainably managed forest products industry.
• European renewable energy legislation is projecting bioenergy will contribute approximately half of the EU renewable energy target of 20% by 2020.
• Consequently Europe is now the world’s largest import market for processed biomass fuel and this market is understandably subject to increasingly stringent sustainability standards, most recently the UK Sustainability Criteria for Solid Biomass.
• British Columbia, Canada has demonstrated its ability to meet the most challenging of sustainability requirements.
• Despite its distance from markets, British Columbian wood pellets contribute to GHG reduction due to their scale of operations, biomass drying, hydroelectricity for pelleting and highly efficient ocean shipping.

WHAT MAKES A SUSTAINABLE BIOMASS SUPPLY?

I. World-Class Sustainable Forest Management

• British Columbia (BC) has some of the most stringent forest laws, regulations, and practices in the world, delivering a careful balance of economic and environmental benefits. This was confirmed by a 2009 independent study of 11 jurisdictions legislation and certification schemes which concluded that “Canada and the province of BC continue to be a world leader in practicing sustainable forest management.” (Indufor, Finland)
• BC’s array of policies, laws, and regulations, addresses globally recognized sustainable forest management elements such as land use planning, forest management practices, public consultation, Aboriginal involvement, protected areas, biodiversity, and endangered species.
• Third-party sustainable forest management certification compliments these controls and together they provide assurances to purchasers in Europe that Canadian forest products come from sustainable source independent forest certification programs.
• The government of BC carefully regulates the amount of timber that may be harvested each year, through the office of the Chief Forester. This Annual Allowable Cut (AAC) is independent of forest product & wood pellet demand.
• Using waste byproducts for pellet, production eliminates the regulated requirement to burn this waste material through reducing fire hazards and avoiding the risk of disease and pest infestation.
• In fact, by law, all harvested areas in BC must be regenerated. This is done through natural regeneration or planting to maintain species diversity. 80% of the harvested areas are replanted within 1.8 years, placing BC at the top of silviculture practices globally.
II. Feedstock Sourced Primarily from Industrial Residues

- The environmental, economic, and regulatory conditions in BC make it possible to support abundant and highly productive forest cover while supporting a sustainable flow of wood products. Biomass feedstock used in pellet production is a byproduct of this process.
- Biomass supply for pellet production in British Columbia (BC) is dependent on the supply and utilization of saw-log harvesting – all forest logging is done to supply logs to sawmills under sustainable forest management regulation. With 92% of saw-log value coming from lumber, it is neither economic nor desirable to source biomass feedstock from standing trees. Figure 1 demonstrates the typical saw-log yield by volume.

![Figure 1. Typical Yield of Saw-log Components in BC, Canada (by volume)](image)

The feedstock for wood pellets in BC comes from 2 main sources:

1. **Sawmilling or Industrial residues** (called Process Residues in EU Renewable Energy Directive):
   - Represents 90-95% of pellet feedstock
   - Produced from sawmills and timber mills (including bark, sawdust, and shavings)
   - Formerly burnt as waste in beehive burners

2. **Forest Harvest residues** (called Forestry Residues in EU Renewable Energy Directive):
   - Represents 5-10% of pellet feedstock
   - Includes low grade logs damaged by insects or disease, cracked, twisted, or otherwise unsuitable to make lumber (90%)
   - Currently piled at roadside and disposed by burning as required by law to avoid pests and fire hazard

- **There is sufficient excess waste fibre to contribute to meeting growing global demands. Over 10 million tonnes of fibre is currently left over after the log harvest.**
  Currently 25% is left behind as debris to provide nutrients and small mammal habitat to ensure biodiversity and health of the forest, with the remaining 7 million tonnes required to be burnt.

- **Additionally there is nearly 140 million tonnes of standing deadwood stocks, an unusually large volume mainly caused by the recent mountain pine beetle epidemic as well as regularly occuring fire damage.**
  These deadstocks could potentially be accessed for bioenergy, particularly in the short to medium term to augment other residues.
III. British Columbia Pellet Suppliers and Infrastructure

IV. FAST FACTS ON BRITISH COLUMBIA FORESTS

• In Canada, forests are managed at the provincial level and 95% of provincial lands are publically owned and managed through a comprehensive regulatory framework for land and resource use planning, which includes direction for both the establishment of protected areas and operational forest planning to ensure a balance of economic, conservation, and environmental benefits for all citizens.

• British Columbia is Canada’s most biologically and ecologically diverse province with over 95 million hectares of land and 55 million hectares of forests representing 18% of Canada’s forested lands. This compares to almost 196 million hectares for all of Europe (excluding Russia).

• Over 14.8% of lands in British Columbia are fully protected with much more located within special management regimes where values such as wildlife habitat, biodiversity, or recreation take precedence.

• British Columbia forest management practices aim at protecting biodiversity and maintaining features of primary forests within managed areas, rather than specifically allocating primary and managed forests as in Europe.

• British Columbia’s results-based forest regulations ensure that public lands provide a mix of benefits such as timber, recreational opportunities, water quality, wildlife habitat, and many others identified through a public planning process.

• British Columbia’s forest regulation requires the retention of woody debris, the use of indigenous tree species and the maintenance of a natural mix of species and stand types.

• Of the 55 million hectares of forests, only 22 million hectares are in the working forests that are considered for harvesting, with only about 200,000 hectares harvested in any year, yielding 75 million m³ (not including bark) or equivalent to 31 m dry tonnes of timber.

<table>
<thead>
<tr>
<th>Name</th>
<th>City</th>
<th>Prov</th>
<th>Capacity</th>
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<tbody>
<tr>
<td>1 Okanagan Pellet Company</td>
<td>Kelowna</td>
<td>BC</td>
<td>50,000</td>
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<tr>
<td>2 Pacific Bioenergy</td>
<td>Prince George</td>
<td>BC</td>
<td>350,000</td>
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<tr>
<td>3 Pinnacle Pellet Armstrong</td>
<td>Armstrong</td>
<td>BC</td>
<td>50,000</td>
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<td>4 Pinnacle Pellet Burns Lake</td>
<td>Burns Lake</td>
<td>BC</td>
<td>400,000</td>
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<td>5 Pinnacle Pellet Meadowbank</td>
<td>Strathnaver</td>
<td>BC</td>
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<td>6 Pinnacle Pellet Quesnei</td>
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<td>100,000</td>
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<td>BC</td>
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<td>9 Premium Pellet</td>
<td>Vanderhoof</td>
<td>BC</td>
<td>180,000</td>
</tr>
<tr>
<td>10 Princeton Co-generation</td>
<td>Princeton</td>
<td>BC</td>
<td>90,000</td>
</tr>
<tr>
<td>11 Vanderhoof Specialty Wood Products</td>
<td>Vanderhoof</td>
<td>BC</td>
<td>30,000</td>
</tr>
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1,820,000 tonnes

Port Information

1 Prince Rupert        www.rupert.com
2 Vancouver            www.portmetrovancouver.com

Pellet Map sourced from Canadian Biomass Magazine
V. Forest Biomass Carbon Neutrality

- According to the UK Department of Energy and Climate Change and as verified by the International Energy Agency, sustainably managed forests “can both provide a stable rate of CO$_2$ removal from the atmosphere and supply renewable materials and wood-fuel.” Ensuring that biomass feedstock is sustainable (in other words, what is used is simultaneously replanted and regrown), means that “biomass can substitute for fossil fuels to deliver GHG savings”.

- The principle of carbon neutrality is generally understood as the biogenic carbon cycle based on photosynthesis. When wood is combusted, CO$_2$ which has been removed from the atmosphere and stored by the tree is released back into the atmosphere and an equivalent amount or more is removed from the atmosphere as the forests are replanted and regenerated. In this balanced carbon cycle, there is no increase in atmospheric CO$_2$ levels. This is in contrast to combustion of fossil fuels, where carbon is released that has been stored in the earth for millions of years and is a one way process that contributes to greenhouse gas emissions and climate change.

- The contribution of biomass to forestry and processing economics can also contribute to increased use of wood products in construction and other long term use. The retention of this processed wood contributes to the retention of carbon stock and displaces other, often energy and resource hungry, material use.

VI. Typical GHG Emissions from British Columbia Wood Pellets

**Typical British Columbia Wood Pellet GHG Lifecycle Emissions**

- **Sawmill Residue**
  - 90-95% sawmill residues
  - 4.0
  - Truck to Plant
    - Average 61km
  - 16.2
  - Drying
    - Predominantly biomass
  - 7.9
  - Pellet Plant
    - Renewable Hydroelectricity (98%)
  - 14.0
  - Rail to BC Port
    - Low GHG rail
  - 66.5
  - Ship to UK Port
    - Highly efficient ocean freight and port terminals
  - 5.7
  - Rail to UK Powerplant

**Total**: 114kg (C0$_{2e}$)/tonne

**UK Powerplant at 39% efficiency**

**Total**: 55.5 kg(C0$_{2e}$)/MWhe

* Actual producer data was used in the UK Biomass Carbon Calculator
** Expected for efficient UK power plants
SUSTAINABLE WOOD PELLET PRODUCTION SUMMARY

British Columbia can meet today and tomorrow’s targets for GHG savings with a supply chain that features:

- Feedstock sourced from the world’s most sustainable fibre basket; primarily from sawmill residues, no dedicated forest harvesting for bioenergy
- Biomass for drying, hydroelectricity for pelleting
- Emphasis on low carbon transportation options; rail from plant to ports and highly efficient ocean freight to European ports
- Job creation and economic diversification in rural communities
- Dedicated export terminals and loading on optimally sized vessels

British Columbia Supply Chain – UK GHG Electricity Trajectory Targets

<table>
<thead>
<tr>
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<th>Typical BC Sawmill Residue Feedstock to 2030</th>
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<tr>
<td></td>
<td>1 Apr 2025 to 31 Mar 2030</td>
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<tr>
<td></td>
<td>1 Apr 2020 to 31 Mar 2025</td>
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<td>1 Apr 2014 to 31 Mar 2020</td>
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kgCO₂eq per MWh

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