

# BC's Wood Pellet Industry

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# Wood Pellets





# What it looked like before



Period	Activity
Late 1980's	Swaans commence feed mill operations
Early 1990's	Changed to wood pellets for residential heating market
2004	Built 2 <sup>nd</sup> mill in Williams Lake for bulk product
2005	Commenced bulk shipments to European Power sector
2006	Built 3 <sup>rd</sup> mill in Houston, partnering with Canfor and Morristown Indian Band
2007	Bought 4 <sup>th</sup> mill in Armstrong for local bag market
2008	Built 5 <sup>th</sup> mill in Meadowbank
	First Bulk shipment to Japan
2011	Acquired by ONCAP (Onex Corp)
	Built 6 <sup>th</sup> mill in Burns Lake
2013	Built Westview export terminal in Prince Rupert and preparing for next phase of growth in line with pellet demand



# B.C. is One of the World's Largest Wood Pellet Producing Areas

- 8 export pellet plants operated by three companies, producing over 1.9 million tonnes of wood pellets
- Situated in BC, one of the worlds most sustainable and plentiful fiber baskets
- Pioneer in the diversification of feedstock (bark, sawdust, shavings, chips, logs)
- Leveraging 25 years of production experience, proprietary equipment & technical expertise
- Dual port, rail linked and parcel size to panamax capable export logistics



# Wood Pellet Plants in BC

## WOOD PELLET PLANTS OPERATING IN B.C.



## Export Plant Capacity 2013

### Pinnacle

Houston	220,000 mt
Burns Lake	440,000 mt
Meadowbank	220,000 mt
Quesnel	90,000 mt
Williams Lake	200,000 mt
Armstrong	60,000 mt

### Pacific Bio

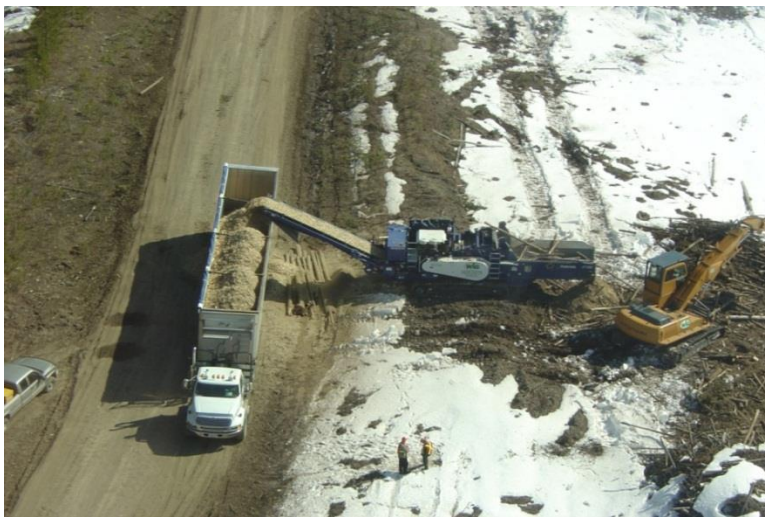
Prince George	400,000 mt
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### Premium

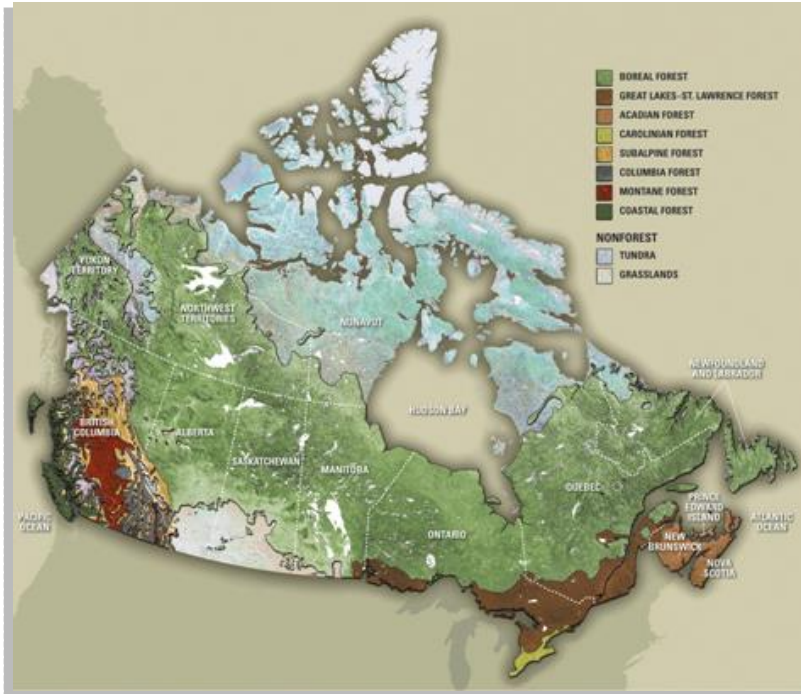
Vanderhoof	140,000 mt
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# Fibre Supply Advantages

- Excellent relationships with the full range of fiber sources
- Optimal utilization of harvest residual
- Use of sawmill residuals has directly resulted in the closure of more than 12 beehive burners
- Diverse mill network minimizes transport costs from forest to mill and mill to mill
- Multiple mills give fiber suppliers comfort that procured fiber can be utilized at different locations
- Proximity of mills allows for stockpiling and fiber transfers between mills in the event of supply shortages



## Secure Fibre



- 310M ha forest.
- 92M ha other treed land.
- 10% worlds forests.
- Harvest < 1% pa.
- Regeneration mandatory.
- Residuals cannot be burned.
- Strong regulatory framework adds security.

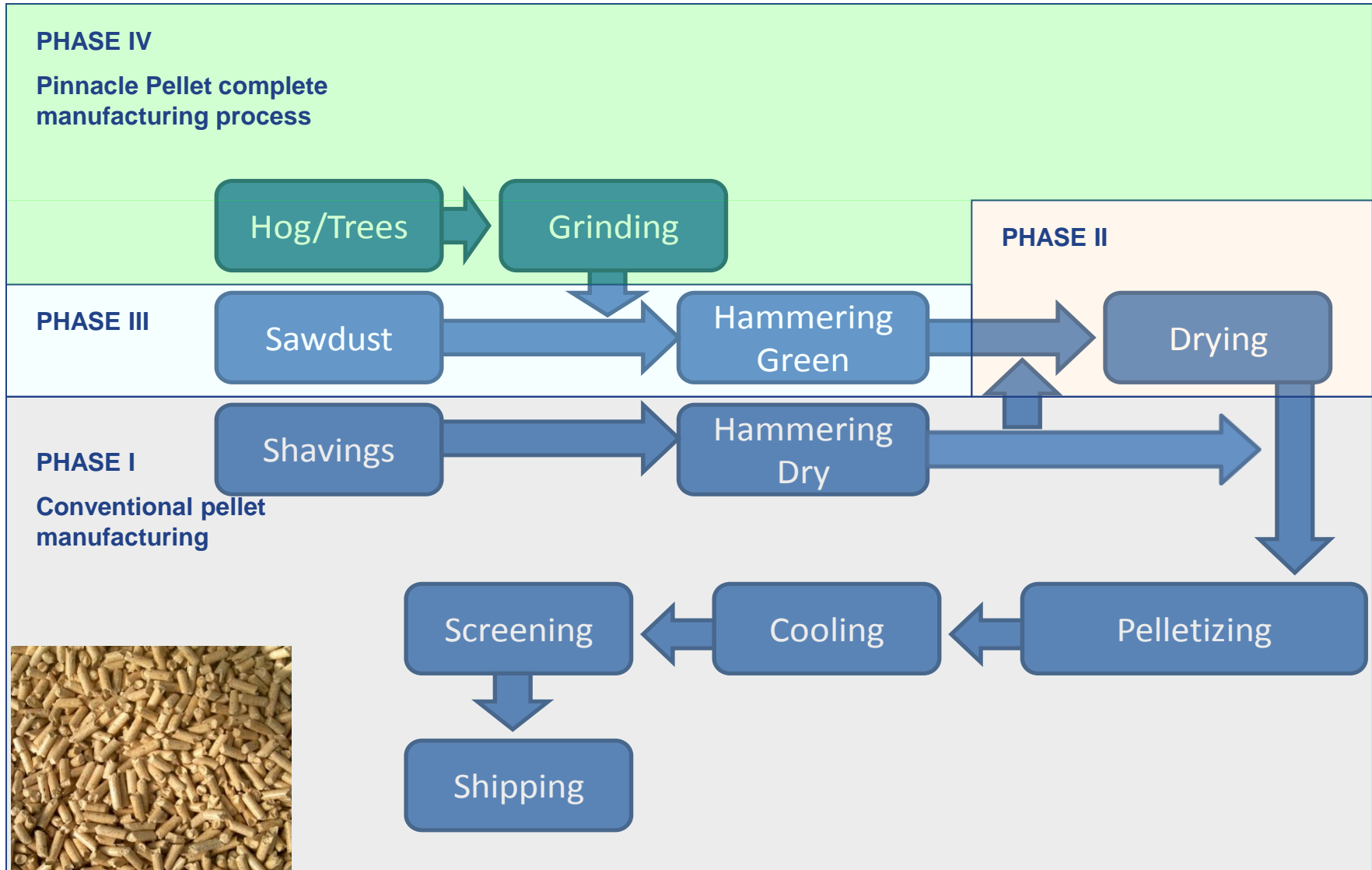


## How Sustainable is Canadian Wood?

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- 93% Canadian forests are Crown Lands.
  - Among the most stringent environmental policy & regulation frameworks in the world – McDermott, Kashore & Kanowski. [Global environmental forest policies : an international comparison](#). London; Earthscan, 2010.
  - 51% accredited with recognised forestry certification.
- Low GHG contribution per ton of pellets.
  - < 120kg CO<sup>2</sup> / tonne wood pellets delivered UK from Vancouver (GGL).
  - > 60% reduced CO<sup>2</sup> emissions vs coal.
  - Low S, N and ash compared to agricultural residues.
- Lowest corruption & illegal logging in the world.
  - German Federal Ministry for Economic Cooperation and Development, 2009
- Replacement of beetle killed timber with new growth restores the carbon sink.

# Pellet Production at a Glance





# Hammering and Grinding



# Drying





# Pelletizing







# Screening



# Storage & Loading





- Wood pellets are the most efficient form of woody biomass for transportation



- Over 500 covered hopper railcars in the fleet



- Super-B delivery to light-industrial, institutional and greenhouse customers



- Full handimax vessels from 2 ports in BC
- Road or rail palletized bag logistics options





# Port of Vancouver (Fibreco)



# Port of Prince Rupert (Pinnacle Westview Terminal)

- Pinnacle owned and operated
- Approved in October 2012
- Construction commenced November 2012
- Completion date December 2013
- Initial capacity 50,000t silo stored
- Berth and ship-loader flexibly configured for small Handysize up to Panamax vessels
- Will be the first dedicated wood pellet terminal in the world capable of handling Panamax vessels.
- Instantaneous load rate of 2,000 tonnes per hour.
- Built-in automatic sampling.
- Dust free, low noise installation



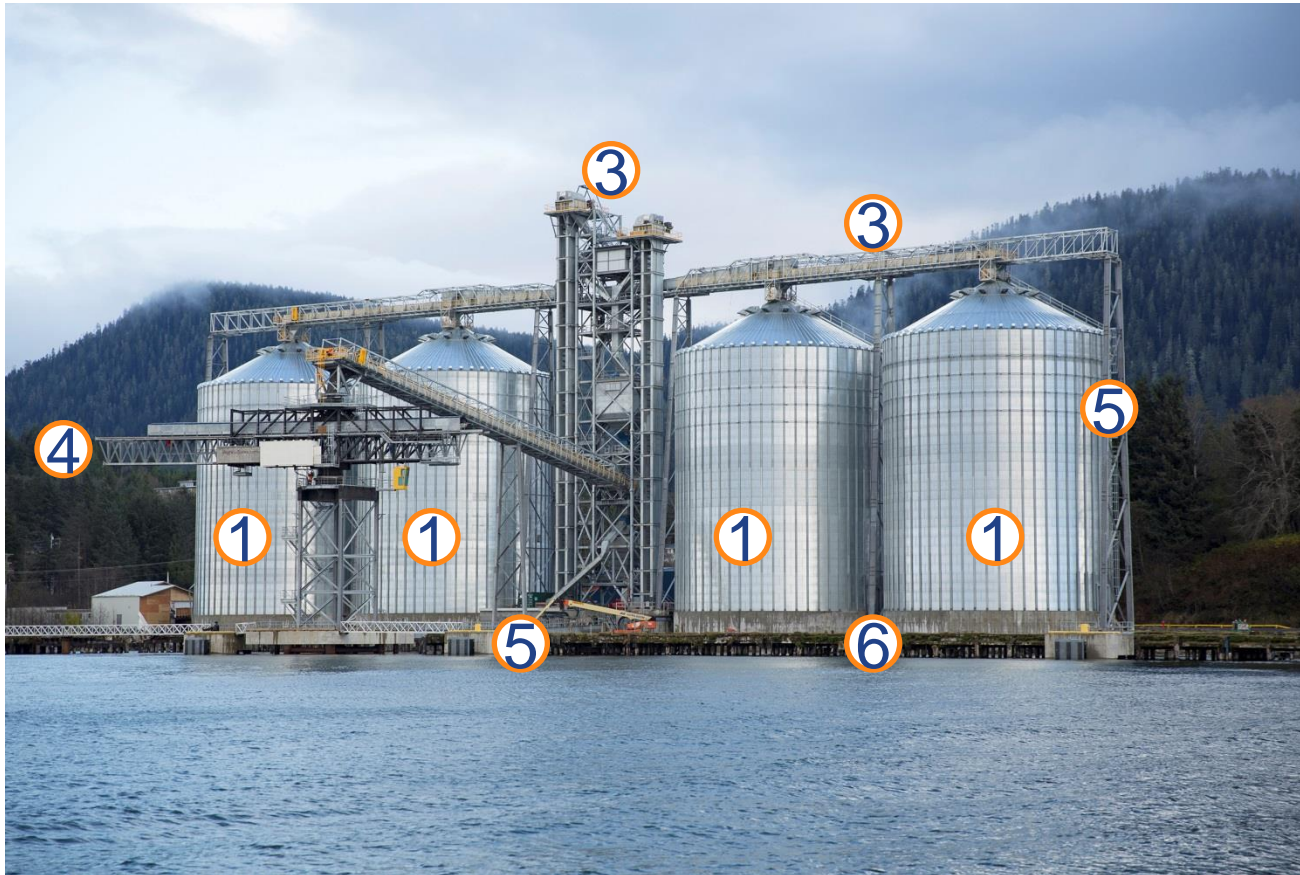
Westview cascade chute



Westview shiploading in operation

# Westview today

Canada's first shipping terminal designed specifically to handle wood pellets



## Design Features

- ① Four corrugated metal wood pellet storage silos: 45 m tall, 27 m diameter; 50,000 tonnes total capacity
- ② Enclosed belt conveyors and bucket elevators
- ③ Ship loader
- ④ Berthing dolphins to secure ships
- ⑤ Berth capable of handling Panamax-class vessels up to 75,000 DWT



# Westview when complete

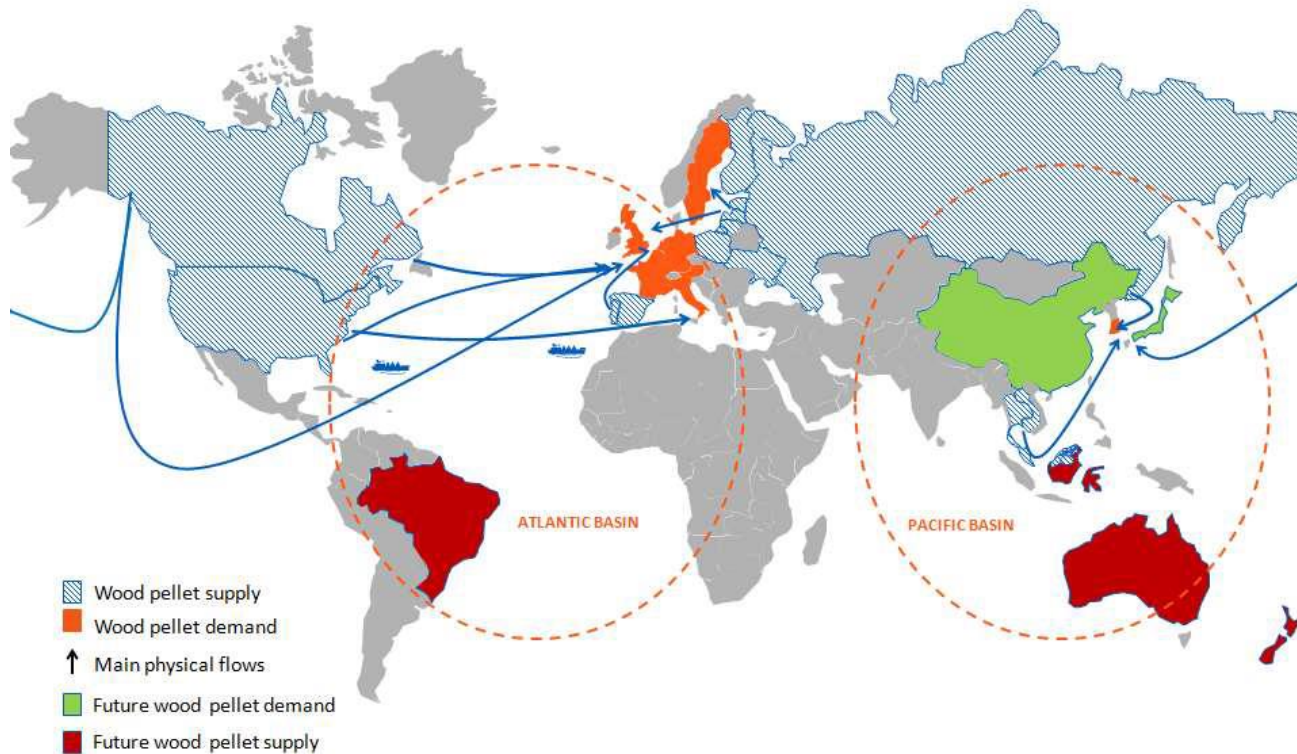
Canada's first shipping terminal designed specifically to handle wood pellets



## Design Features

- ① Four corrugated metal wood pellet storage silos: 45 m tall, 27 m diameter; 50,000 tonnes total capacity
- ② Three possible additional storage silos up to 34,500 tonnes total additional capacity
- ③ Enclosed belt conveyors and bucket elevators
- ④ Ship loader
- ⑤ Berthing dolphins to secure ships
- ⑥ Berth capable of handling Panamax-class vessels up to 75,000 DWT

## Pellet Trade Routes



Source : N Tsigotis, EDF, Seoul Sept. 2013

## Global Wood Pellet Trends

	<u>2011</u>	<u>2015</u>	<u>2020</u>	<u>Main End Uses</u>
Europe	11.5	15.0	24.0	CHP, Power, Residential.
North America	2.5	3.0	3.5	Res'l & Instit'l heat, Bedding
Rest of World	0.5	1.5	4.5	Power, CHP, Bedding
<b>TOTAL</b>	<b>14.5</b>	<b>19.5</b>	<b>32.0</b>	<b>(Estimated)</b>

### By the way...

<i>World coal production</i>	2012(e)	7,831 million tons
<i>World coal traded</i>	2012	1,256 million tons

*Coal still fuels 41% of global electricity and 70% of global steel*

Numbers are approximate, various sources



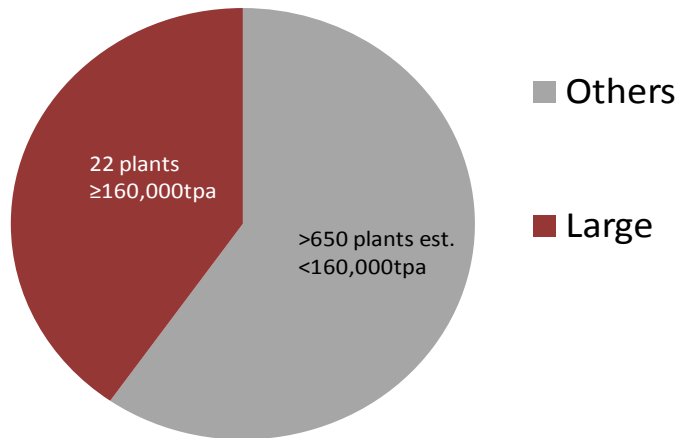
## Pellet Trade and Shipping Issues

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- Geographic concentration – North America and Europe.
- Commercial concentration – few large players on both sides of the trade.
- Long term commercial arrangements for the most part.
- Driven by European & Asian renewable energy policy rather than carbon economics.
- Low margins.
- Transport intensive product.
  - Group B, Class MHB in IMSBC Code - Off gassing.
  - Not listed under MSC 1/Circ 1395 - CO2 fitting, under review
  - Marpol V - likely not harmful to marine environment – testing.
  - Wet sensitive, dusty.

## Global Wood Pellet Supply Dynamics

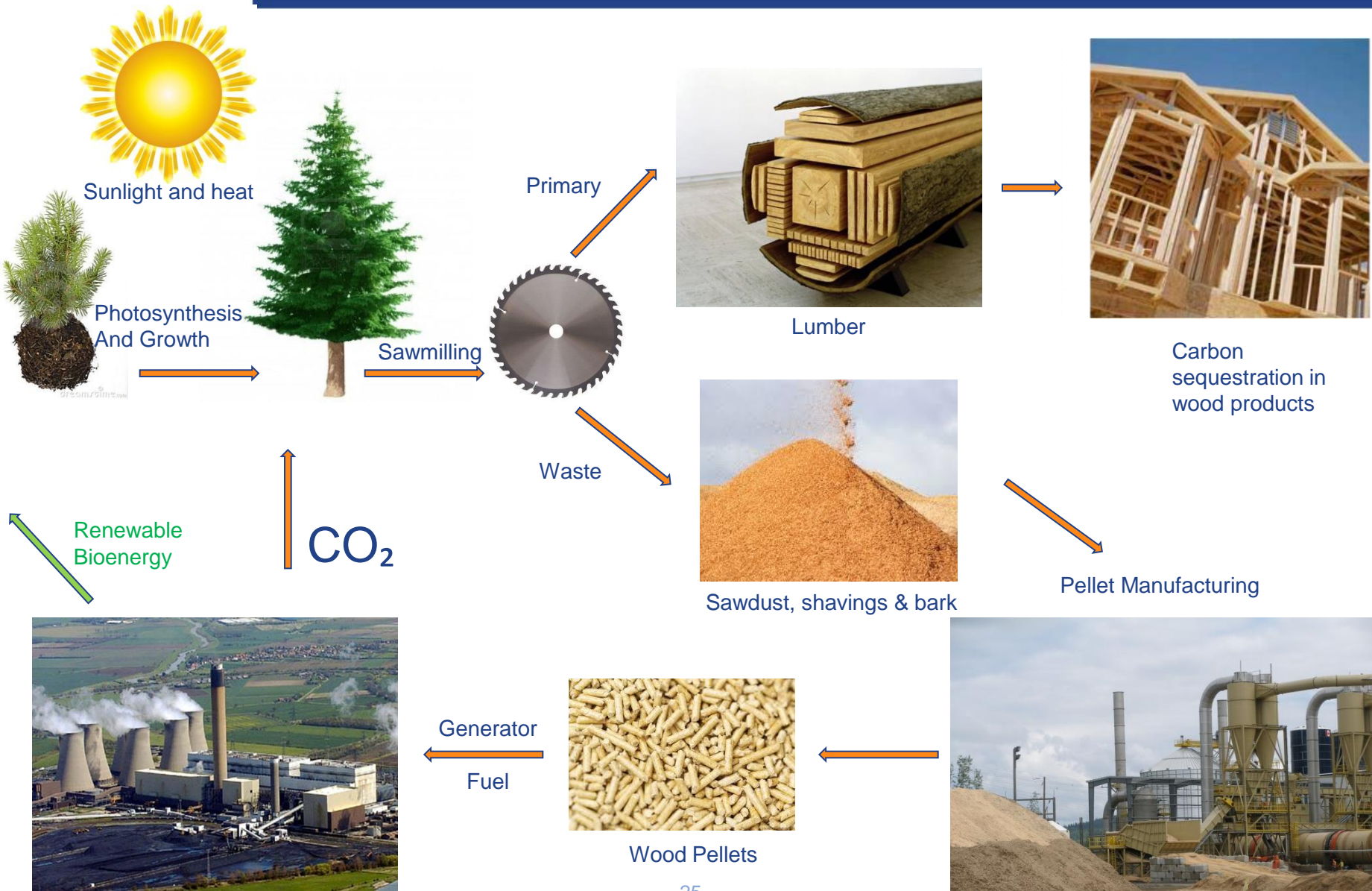
### Global Capacity



### Large Scale Wood Pellet Mills 2012

Vyborgskaya Cellulose	Russia	900,000
Georgia Biomass	USA	750,000
Green Circle	USA	560,000
<b>Pinnacle Burns Lake</b>	<b>Canada</b>	<b>440,000</b>
<b>Pacific Bioenergy</b>	<b>Canada</b>	<b>400,000</b>
Enviva Ahoskie	USA	350,000
German Pellets Wismar	Germany	250,000
G.P. Herbrechtingen	Germany	250,000
<b>Pinnacle Meadowbank</b>	<b>Canada</b>	<b>220,000</b>
<b>Pinnacle Houston</b>	<b>Canada</b>	<b>220,000</b>
<b>Pinnacle Williams Lake</b>	<b>Canada</b>	<b>200,000</b>
Arkaim	Russia	200,000
<b>TOTAL TOP 12</b>		<b>4,740,000</b>
<b>Of Which Canadian</b>		<b>1,480,000</b>

# Pinnacle and Low Carbon Energy





Thank You