Status Update: Canadian Wood Pellet Industry

Presentation at PPWC Forestry Seminar
November 17, 2016 | Vancouver, BC

Gordon Murray, Executive Director

WOOD PELLET
ASSOCIATION OF CANADA

Topics

- Wood pellets 101
- Where pellets fit in the bioenergy sector
- Where pellets fit in the forestry sector
- Pellet fibre sources
- Production and consumption statistics
- Export markets
- Canadian market opportunity

Wood Pellets 101

- Renewable fuel
- Made from compressed wood fibre.
- Lignin binds the fibre. No adhesives needed.

Wood pellet uses

Power generation
Efficiency ~ 35%

Heat, & hot water
Residential/commercial/institutional
Efficiency ~ 90%

Animal bedding & oil patch absorbent

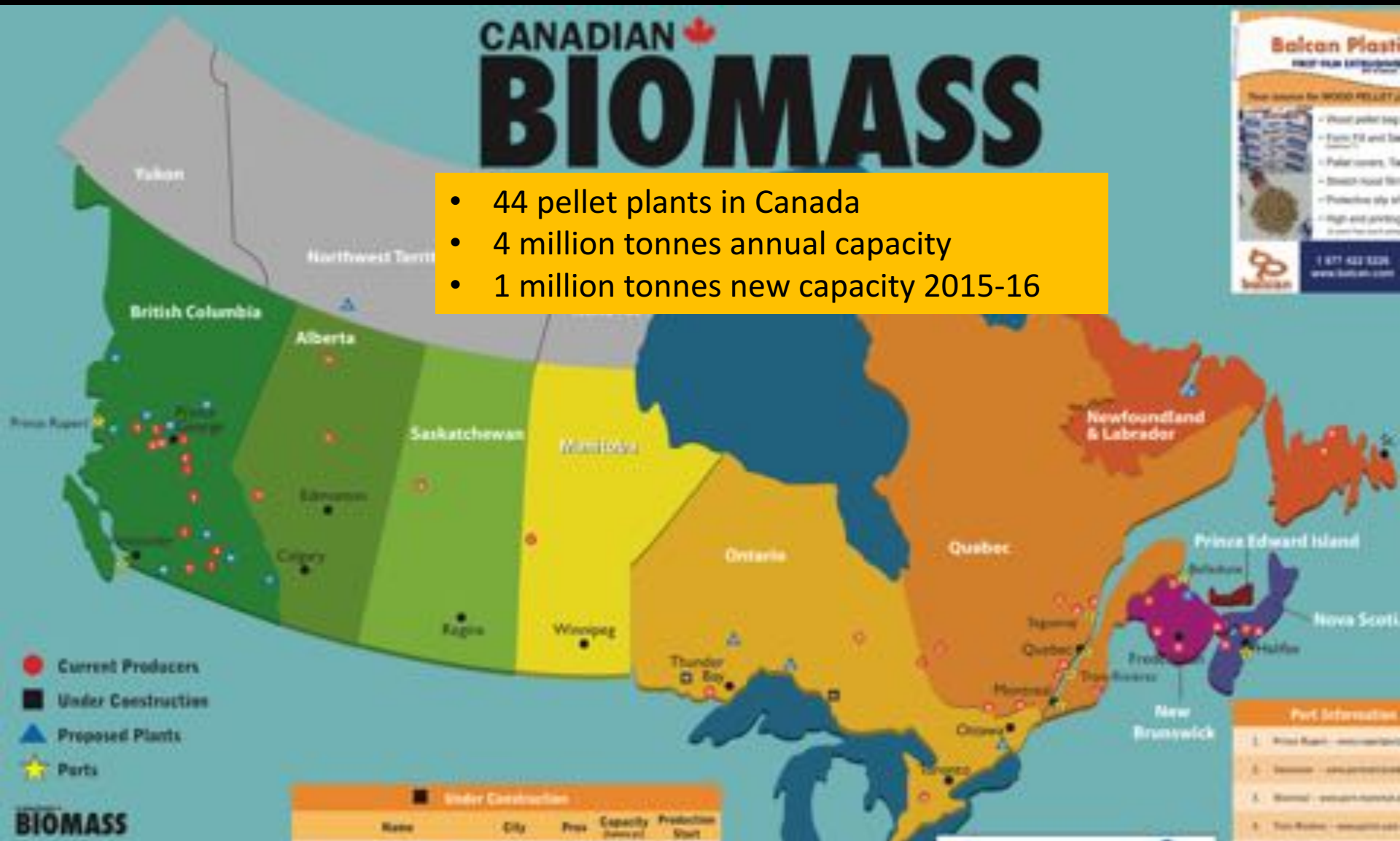
Leading Bioenergy Products

- Ethanol – 1.6 bn litres per year. Net importer. Made from corn and wheat. National mandate – 5%.
- Biodiesel – 350 mn litres per year – most exported to USA, then re-imported as blended diesel. Canola, animal fats, recycled cooking oils. Mandate - 2%.
- Wood pellets – 2.7 million TPY, 90% exported.

The Pellet Sector within Canada's Forest Industry

- Annual log harvest: 130 million tonnes
- Fibre used for pellets: 5 million tonnes (4%)
- Annual forest products revenue: $60 bn
- Annual revenue from pellets: $0.3 bn (0.5%)

Canadian Wood Pellet Plants



- 44 pellet plants in Canada
- 4 million tonnes annual capacity
- 1 million tonnes new capacity 2015-16

BC Export Pellet Plants > 75,000 tonnes

1 Pinnacle Renewable Energy
2 Pinnacle Renewable Energy
3 Pinnacle Renewable Energy
4 Pacific BioEnergy
5 Premium Pellet
6 Pinnacle Renewable Energy
7 Canfor/Pinnacle Pellet
8 Tolko/Pinnacle
9 Canfor/Pacific BioEnergy
10 Canfor/Pacific BioEnergy

Planning Stage: Newpro announced conversion of a particle board plant to produce 80,000 TPY of pellets in Smithers

Wood Pellet Fibre Sources

Sawmill residues

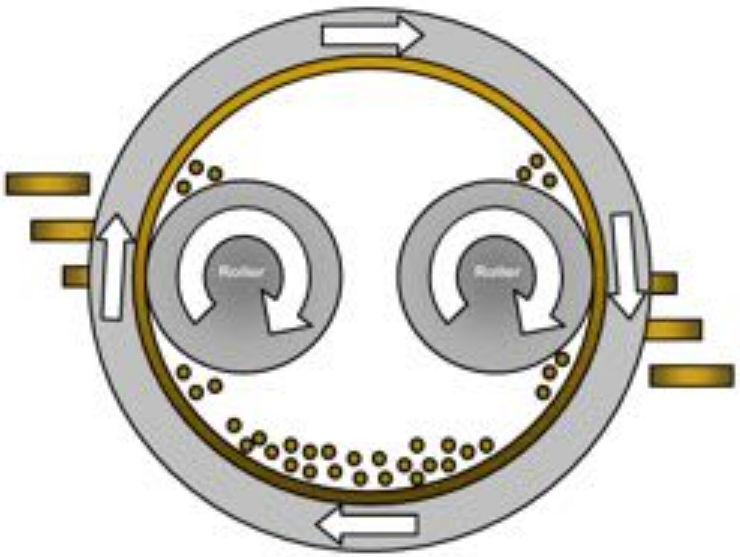
- sawdust and shavings
- Typically not wood chips

Logging residues

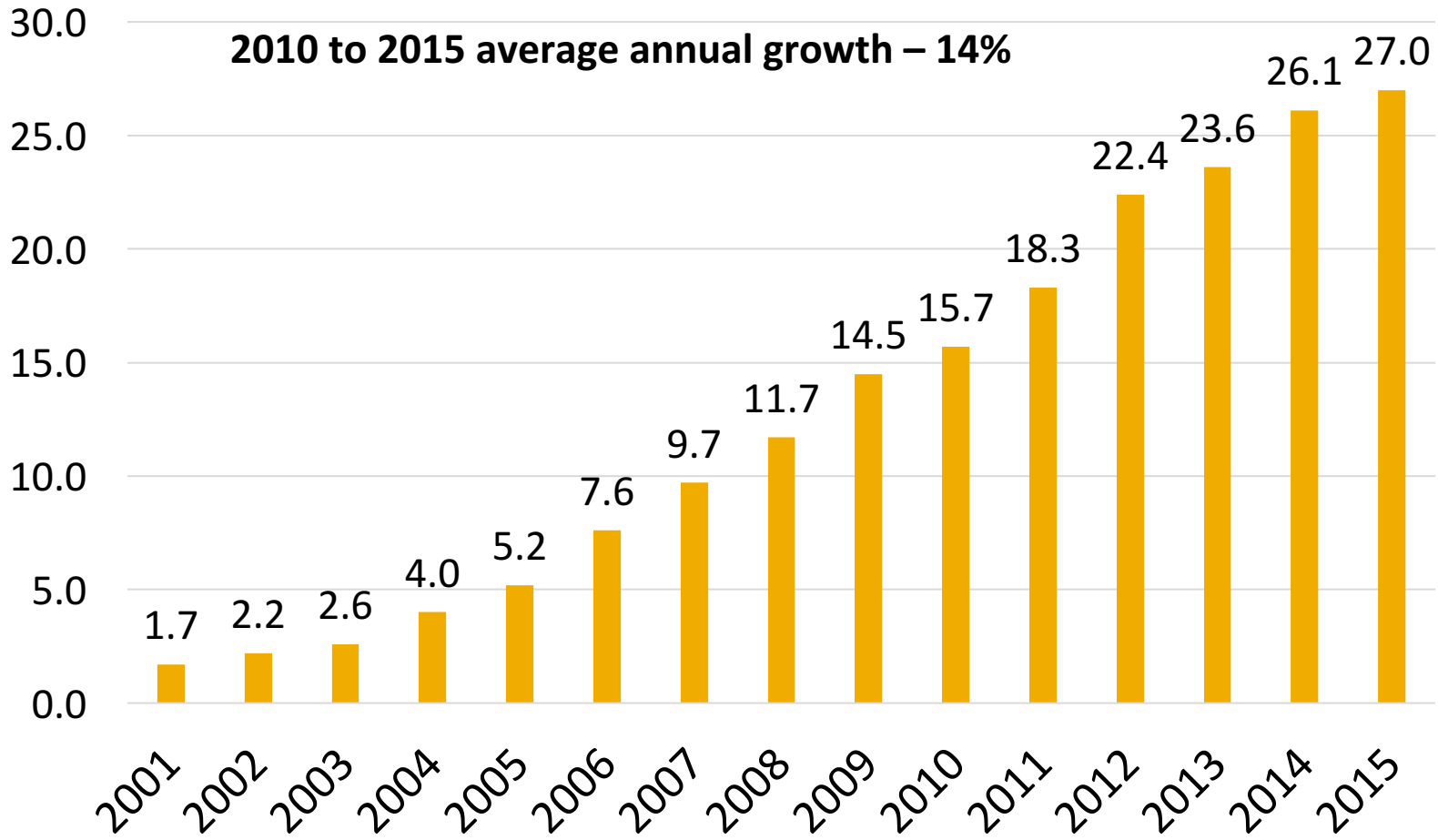
Pellet producers often trade with pulp mills – bark in exchange for sawdust/shavings

Bush Grinding Harvest Residuals

Wood Pellet Extrusion



Wood Pellet Global Production – millions of tonnes

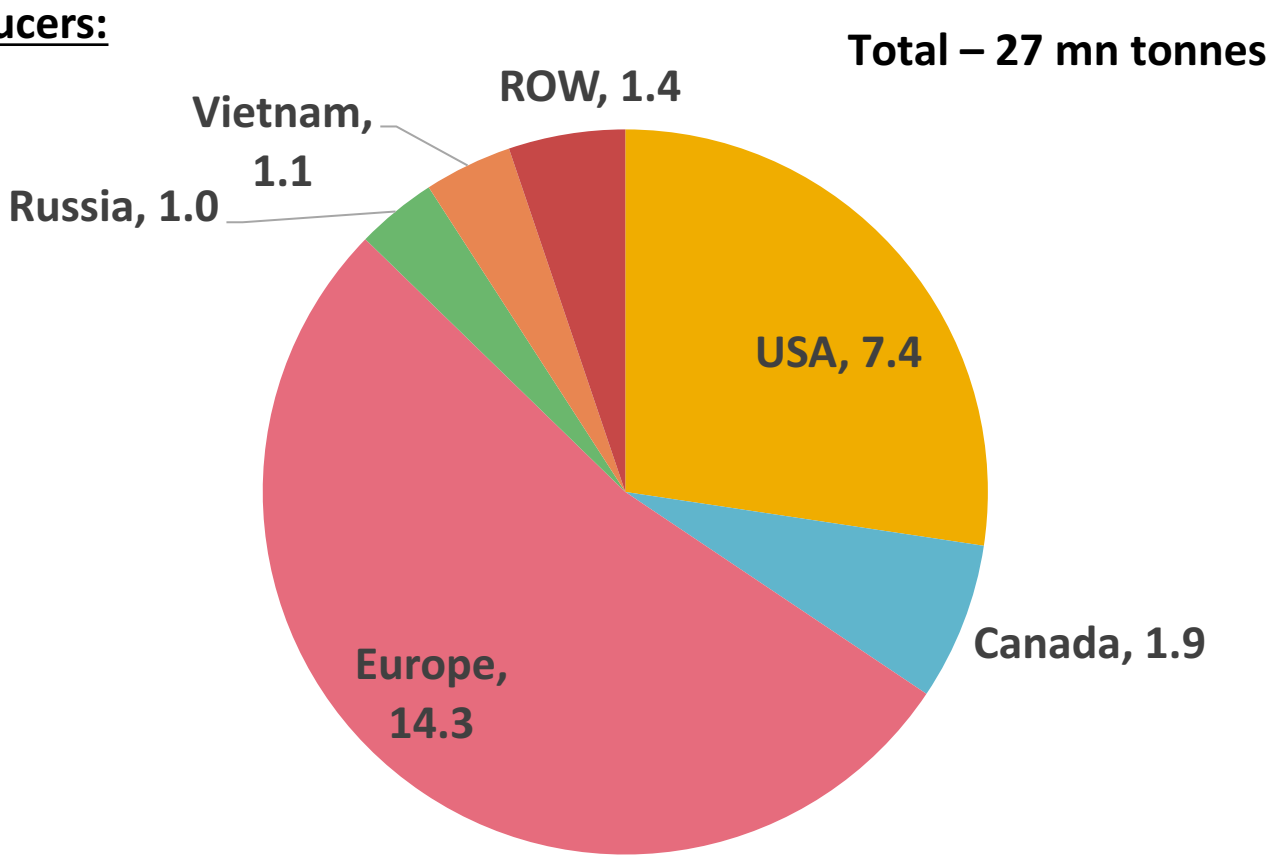


Sources: Hawkins Wright, REN 21, Future Metrics

World Regional Pellet Production – 2015 Millions of Tonnes

Top European Producers:

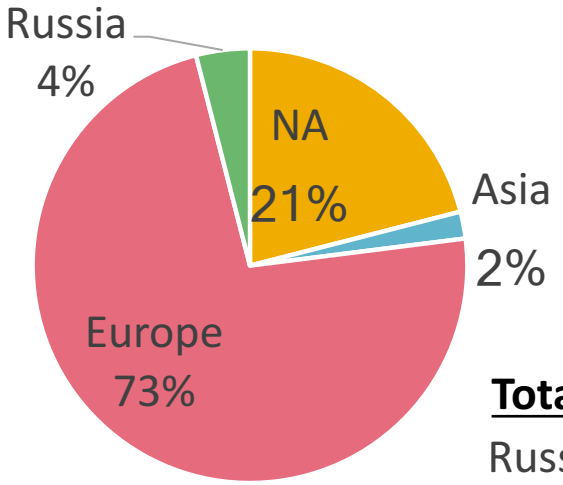
Germany
Sweden
Latvia
Estonia
France
Portugal



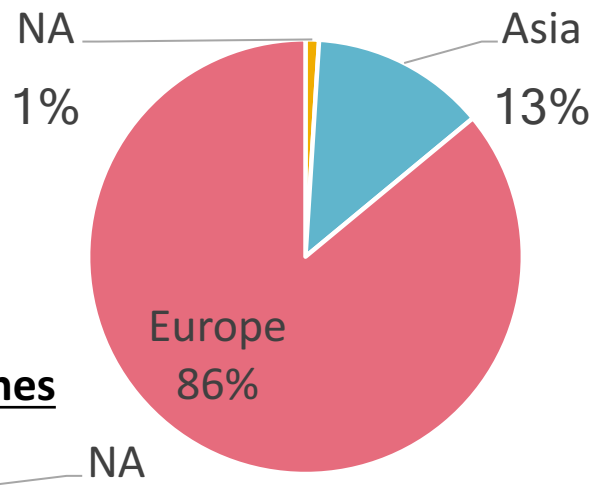
Sources: REN21 Global Status Report 2016, Hawkins Wright

World Regional Pellet Consumption - 2015

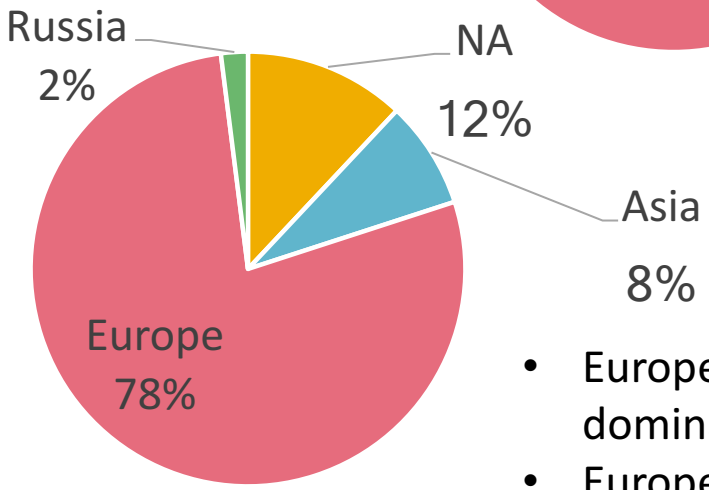
Heating – 14 mn tonnes



Industial – 13 mn tonnes



Total – 27 mn tonnes



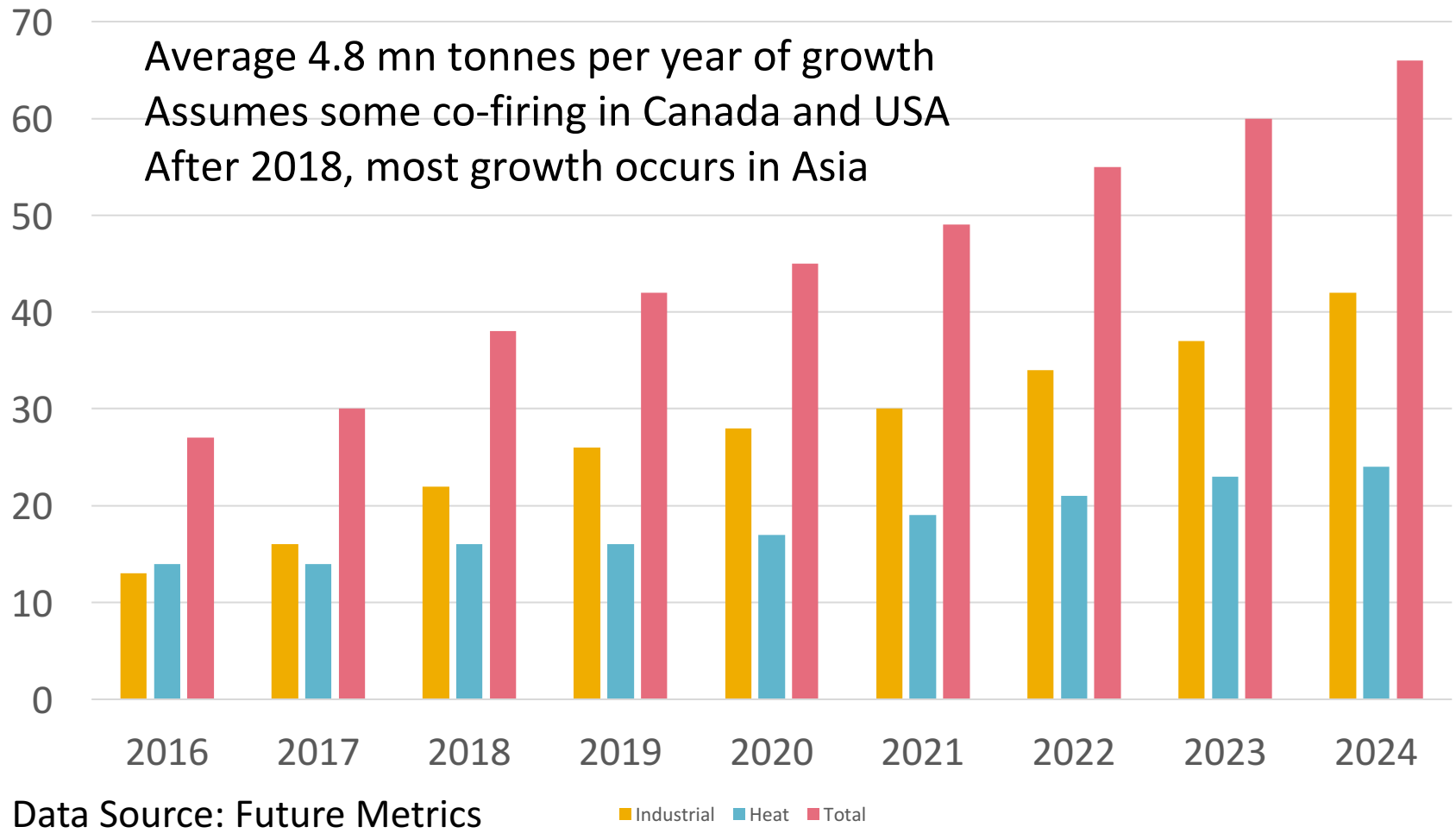
- Europe continues to dominate
- Europe's heat sector exceeds industrial sector

Source: Hawkins Wright

EU Policy Support

- 2009: Renewable Energy Directive – 20-20-20 targets
- 2010: National Action Plans
- National support schemes: green certificates, contracts for difference, renewable heat incentive
- 2014: Climate and Energy Framework for 2030 – 40% GHG cut from 1990, 27% renewable energy, 27% improvement in energy efficiency

Global Demand Outlook to 2024



Data Source: Future Metrics

5 European Biomass Power Projects

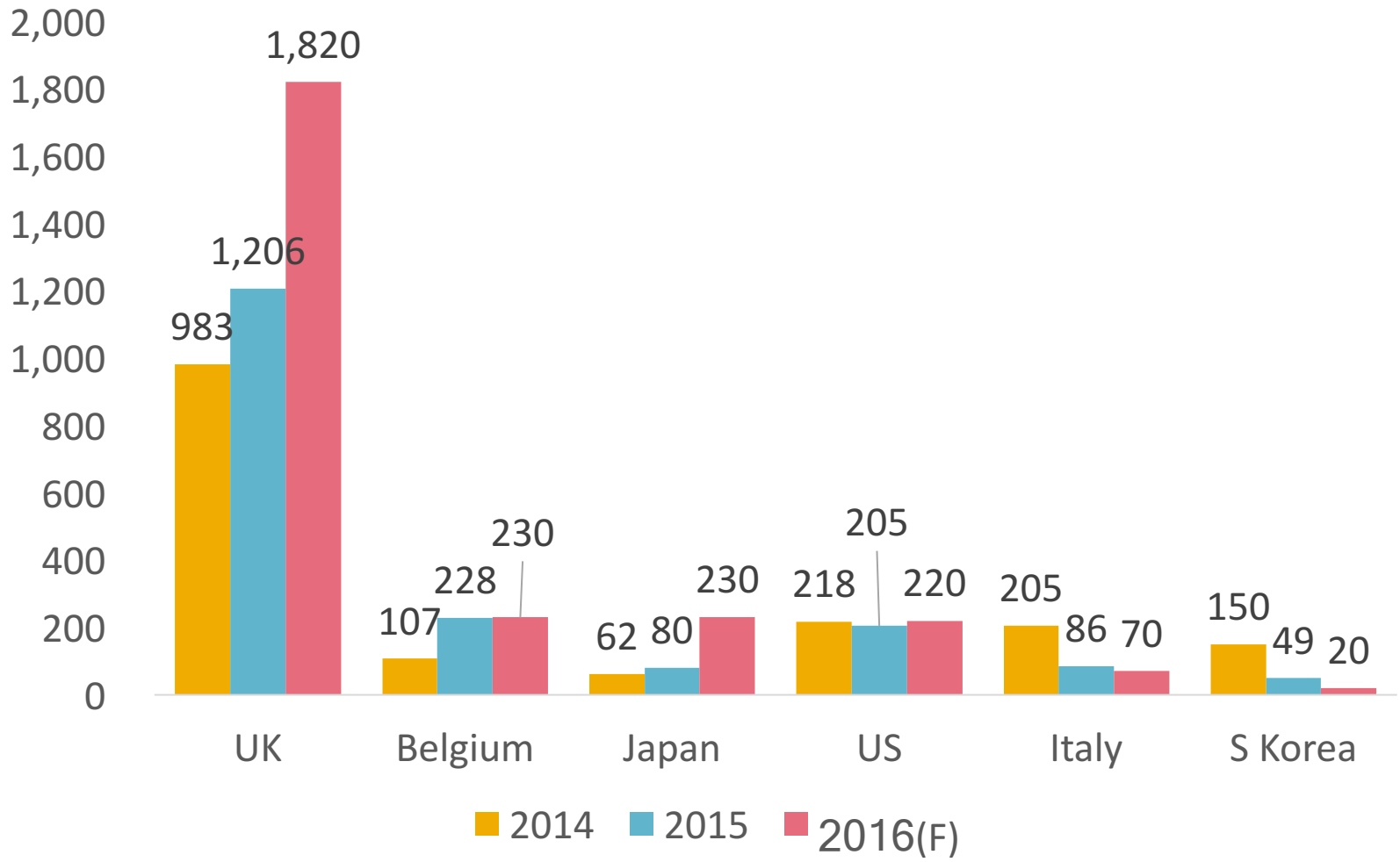
- EPH Lynemouth, UK: 645 MW, 2.5 mn TPY
- MGT Teeside, UK: 299 MW, 1.6 mn TPY
- Langerlo, Belgium: 420 MW, 1.0 mn TPY
- RWE Amer, NL: 600 MW, 1.2 mn TPY
- Engie Maaslavke, NL, 800 MW, 0.2 mn TPY

5 Asian Biomass Power Projects

- KOSEP Yeongdong, SK, 125 MW, 0.6 mn TPY
- KOSPO Samcheok, SK, 2,000 MW, 0.4 mn TPY
- Nakayama Nagoya 2, JPN, 110 MW, 0.1 mn TPY
- Soma Kyodo Jikahatsu, JPN, 112 MW, 0.02 mn TPY
- Orix Hibikinada, JPN 112 MW, 0.1 mn TPY

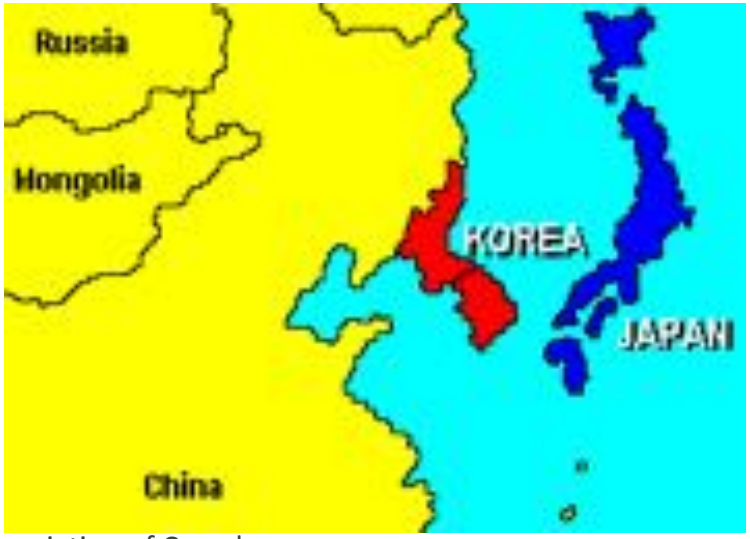
North American pellet shipping routes

Canadian Export Destinations – thousands of tonnes



Developments in Asia-Pacific

- Demand in Japan and Korea is growing
- Policy uncertainty remains.
- Asia-Pacific and Russian pellet producers have transportation advantage over NA
- Canadians have quality and reliability advantage



Japanese Wood Pellet Market

- Primarily an industrial market
- Feed-in-tariff for IPPs – many under development
- Replacement of nuclear power by thermal coal plants and biomass co-firing
- Consumes chips, PKS, and pellets
- Preference for quality, reliability and long term contracts = advantage for Canada

South Korean Wood Pellet Market

- Primarily an industrial market
- Renewable portfolio standard
- Market is growing
- Price is number one concern
- Purchases dominated by tendering
- Consume biomass SRF pellets
- Dominated by Vietnam

Canada’s competition in Vietnam

Canada's competition in Vietnam

Canada's Climate Change Plan (1)

- "Pan-Canadian Framework on Clean Growth and Climate Change"
- Agreed to in 2016 by federal government, provinces and territories
- 2030 target: 30% GHG reduction from 2005 level
- Pricing carbon pollution - $10 per tonne in 2018 rising to $50 per tonne in 2022

Canada's Climate Change Plan (2)

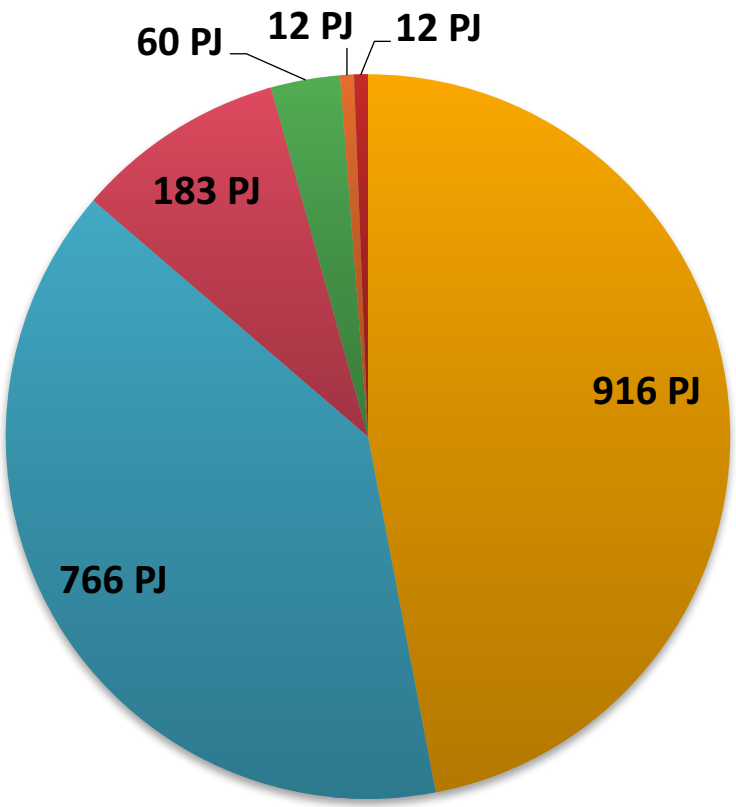
- Increase renewable and non-emitting electricity (currently 80%, ranked 4th in world)
- Phase out coal power by 2030 (35 million tonnes of coal per year)
- Eliminate diesel power generation in remote communities

OPG's Atikokan Power Plant

Converted from coal, now firing on 100% wood pellets

Canadian Annual Heat Energy Use by Fuel Type

Residential and Commercial Heat and Hot Water



Total: 2688 PJ

- Natural Gas
- Electricity
- Oil
- Firewood
- Wood Pellets
- Propane & Other

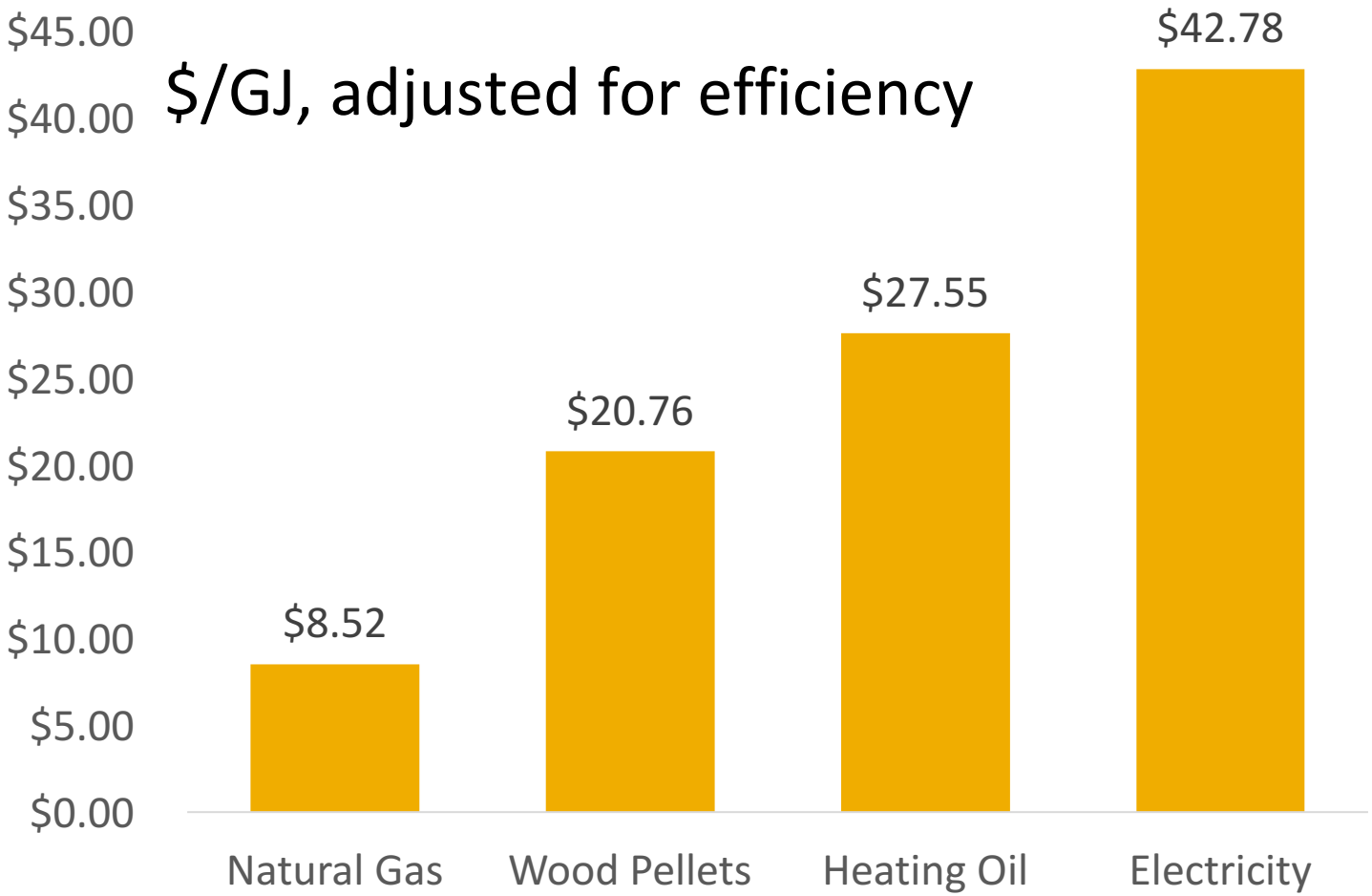
Source: Stats Canada

Ontario Energy Costs 2016

- Heating oil – 86 cents per litre, 85% efficiency
- Natural gas – 27 cents per cubic metre, 85% efficiency
- Wood pellets - $300 per ton, 85% efficiency
- Electricity – 15.4 cents per kWh, 100% efficiency

Source: Enbridge website

Ontario Domestic Fuel Costs - 2016



Sources: Enbridge, National Energy Board, WPAC research

Magnitude of the Opportunity

- Canadian annual non-gas commercial and residential heat and hot water energy consumption is 1,033,000,000 gigajoules
- 1,033,000,000 gigajoules is equivalent to 71 million tons of wood pellets.
- Canada currently produces about 2.7 million tons of wood pellets

Conclusions

- The global wood pellet industry is growing
- In the short term, production capacity has outpaced demand, this will be corrected by 2018
- Will see continued growth in Europe and Asia
- Japan is most interesting Asian market
- Significant potential domestic potential
- Limited competition with pulp sector
- Jobs from wood waste!

Thank you!

For more information:
Contact Gordon Murray
gord@pellet.org
(250) 837-8821