

# **Canfor Fuel Switch Projects**

## **2016 Public Sector Climate Action Leadership Symposium**

Michael Jordan

Director Environment, Energy and Climate Change Policy

Canfor

Vancouver November 21, 2016

# Our Company

---



BC - based integrated forest products company

- Origins late 1930's with Pacific Veneer in New Westminster
- Now
  - 10 Sawmills BC, 1 Alta, 12 SE US;
  - majority owner of Canfor Pulp with 3 Kraft Pulp mills in Prince George; 1 BC TMP mill Taylor BC;
  - With recent purchase of Anthony Forest Products we own a glulam beam facility in the SE US and are joint owner of an I-Joist facility in Ontario
- We are a major producer of sustainable forest products
- Products include SPF dimensional lumber, pulp and paper, and beams
- Also a leading producer of green energy including heat and power, and wood pellets

Visit **[www.canfor.com](http://www.canfor.com)**

---

# NORTH AMERICAN OPERATIONS

## LUMBER

1. AB, Grande Prairie » Grande Prairie Sawmill
2. BC, Bear Lake » Potar Sawmill
3. BC, Chetwynd » Chetwynd Sawmill
4. BC, Elko » Elko Sawmill
5. BC, Fort St. John » Fort St. John Sawmill
6. BC, Houston » Houston Sawmill
7. BC, Mackenzie » Mackenzie Sawmill
8. BC, Prince George » Isle Pierre Sawmill
9. BC, Prince George » J.D. Little Forest Centre
10. BC, Prince George » Prince George Sawmill
11. BC, Radium Hot Springs » Radium Sawmill
12. BC, Vanderhoof » Plateau Sawmill
13. BC, Vavenby » Vavenby Sawmill
14. BC, Wynnadel » WynnWood Sawmill
15. AL, Fulton » Fulton Sawmill
16. AL, Jackson » Jackson Sawmill
17. AL, Mobile » Mobile Treating Plant
18. AL, Mobile » Mobile Sawmill
19. AR, El Dorado » Urbana Sawmill
20. GA, Moultrie » Moultrie Sawmill
21. GA, Thomasville » Thomasville Sawmill
22. MS, Hermanville » Hermanville Sawmill
23. NC, Graham » Graham Sawmill
24. SC, Camden » Camden Sawmill
25. SC, Conway » Conway Sawmill
26. SC, Darlington » Darlington Sawmill
27. SC, Marion » Marion Plant
28. SC, Myrtle Beach » New South Express, Trucking fleet serving NC, SC, VA, GA and AL

## PULP AND PAPER

29. BC, Prince George » Intercontinental Pulp Mill
30. BC, Prince George » Northwood Pulp Mill
31. BC, Prince George » Prince George Pulp & Paper Mill
32. BC, Taylor » Taylor Pulp Mill

## PELLETS

33. BC, Chetwynd » Chetwynd Pellet Plant
34. BC, Fort St. John » Fort St. John Pellet Plant
35. BC, Houston » Houston Pellet Plant

## GLULAM

36. AR, El Dorado » Arkansas Laminating Plant
37. GA, Washington » Georgia Laminating Plant

## I-JOISTS

38. ON, Sault Ste. Marie » Anthony EACOM Inc. I-Joist Plant

## CHIPS

39. TX, Troup » Troup Chip Plant

## INNOVATION

41. BC, Burnaby » Canfor Pulp, Innovation Centre



## GREEN ENERGY

40. AB, Grande Prairie » Canfor Green Energy



## SUSTAINABLE PRODUCTS GROWN BY THE POWER OF THE SUN

Forestry is a renewable industry based on the responsible management of our forests. Every area we harvest in British Columbia and Alberta is replanted with native trees to ensure the regeneration of a healthy, natural forest.

More than 98% of our woodlands in Canada are third-party certified to an internationally recognized standard.

Canfor is committed to maximizing the utilization of each tree we harvest, turning nearly 100% of our fibre into useful, sustainable products.



**IN 2015, CANFOR PLANTED  
78 MILLION TREES!**



[WWW.CANFOR.COM](http://WWW.CANFOR.COM)

**47%**

**FINISHED LUMBER**

SOME OF WHICH IS USED FOR ENGINEERED  
WOOD PRODUCTS

**30%**

**CHIPS**

USED TO MAKE PULP AND PAPER

**14%**

**SAWDUST AND SHAVINGS**

USED TO MAKE PELLETS AND GREEN ENERGY

**5%**

**BARK**

USED TO MAKE PELLETS AND GREEN ENERGY

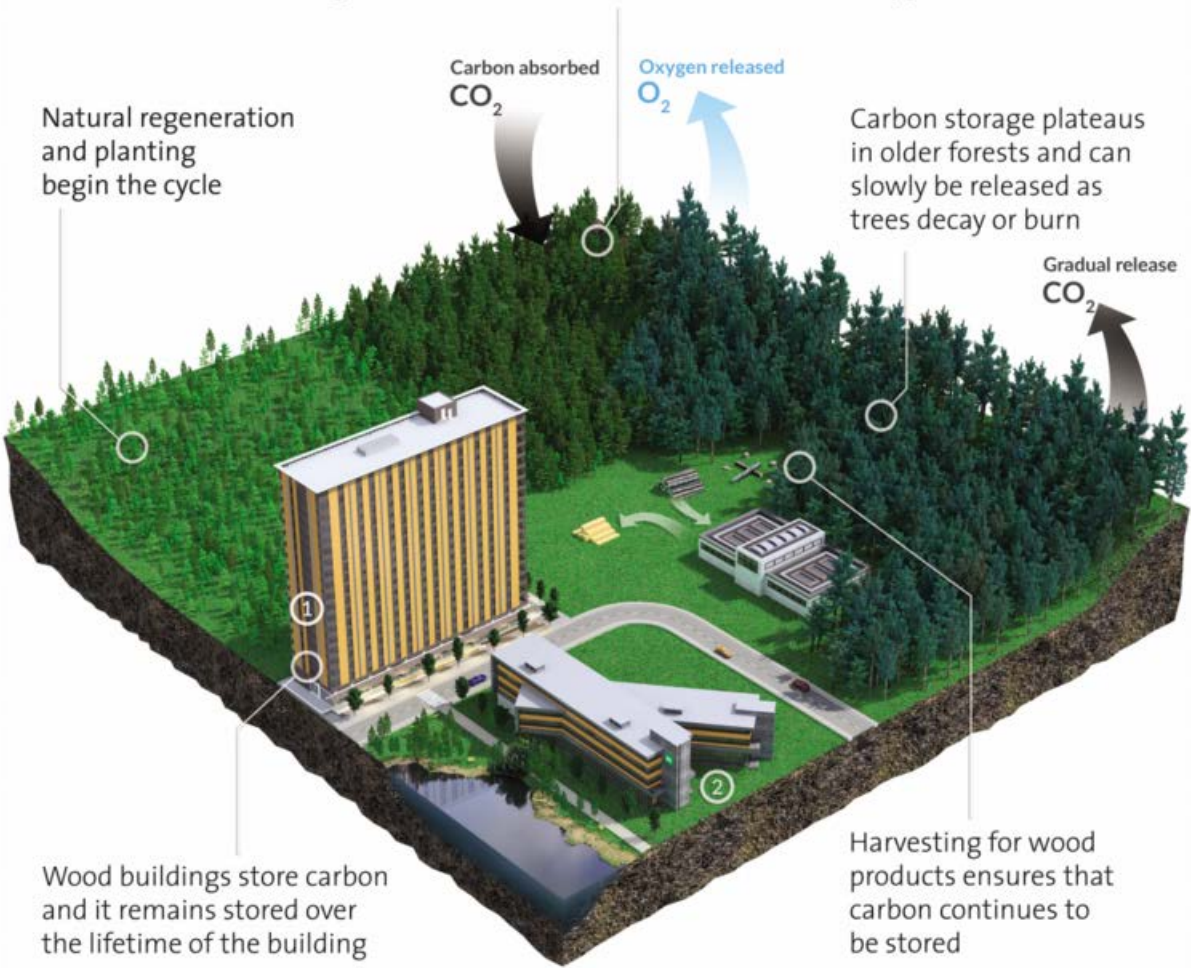
**4%**

**TRIM ENDS**

USED TO MAKE FINGER JOINED STUDS



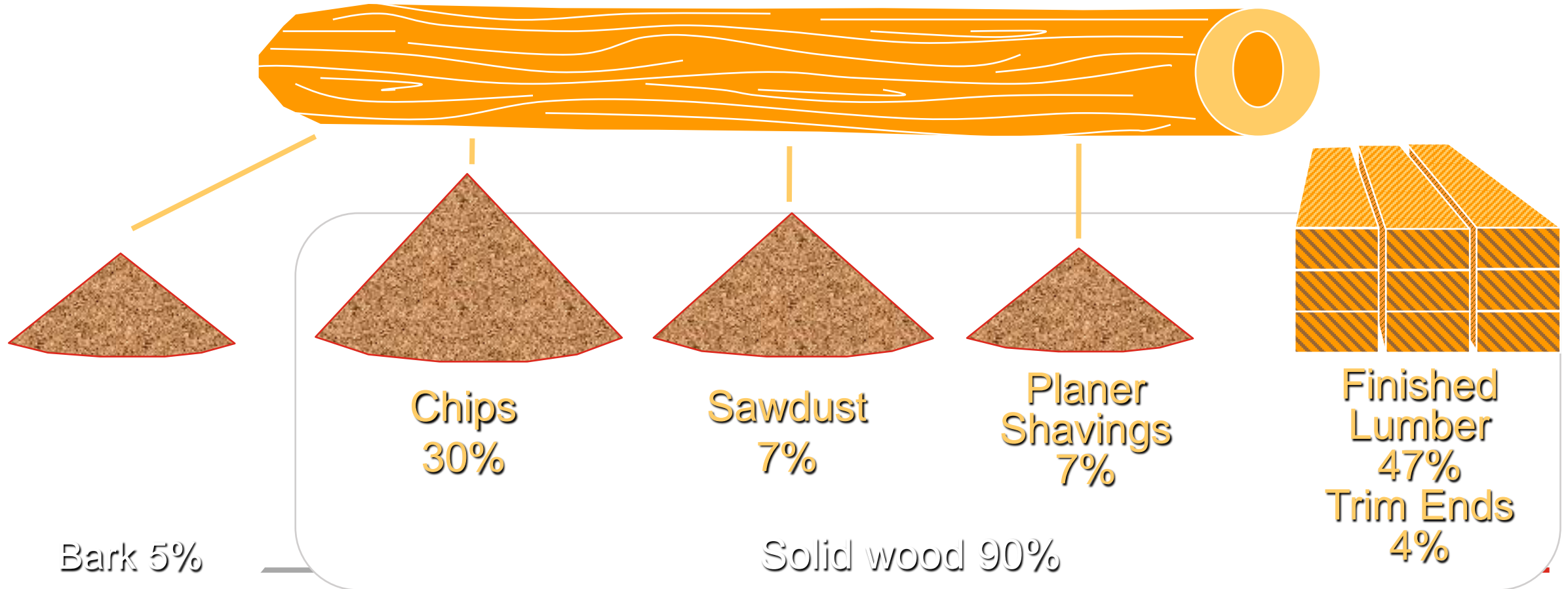
# Growing Forests Absorb Carbon Dioxide and Release Oxygen



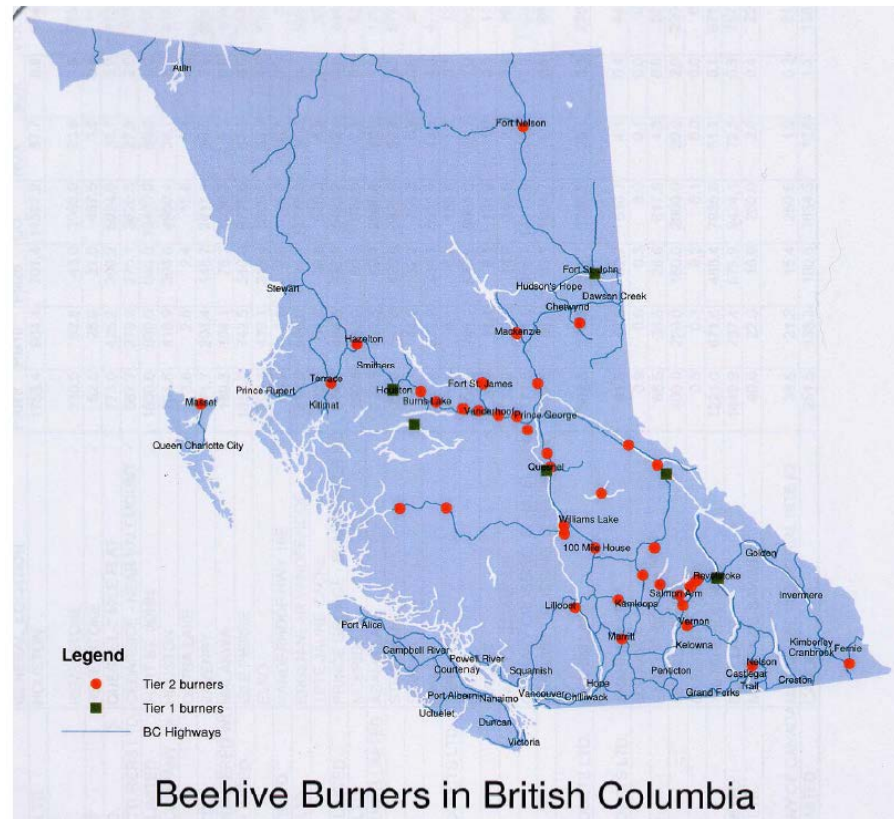
# Wood Residuals are ~1/5 of the Raw Log



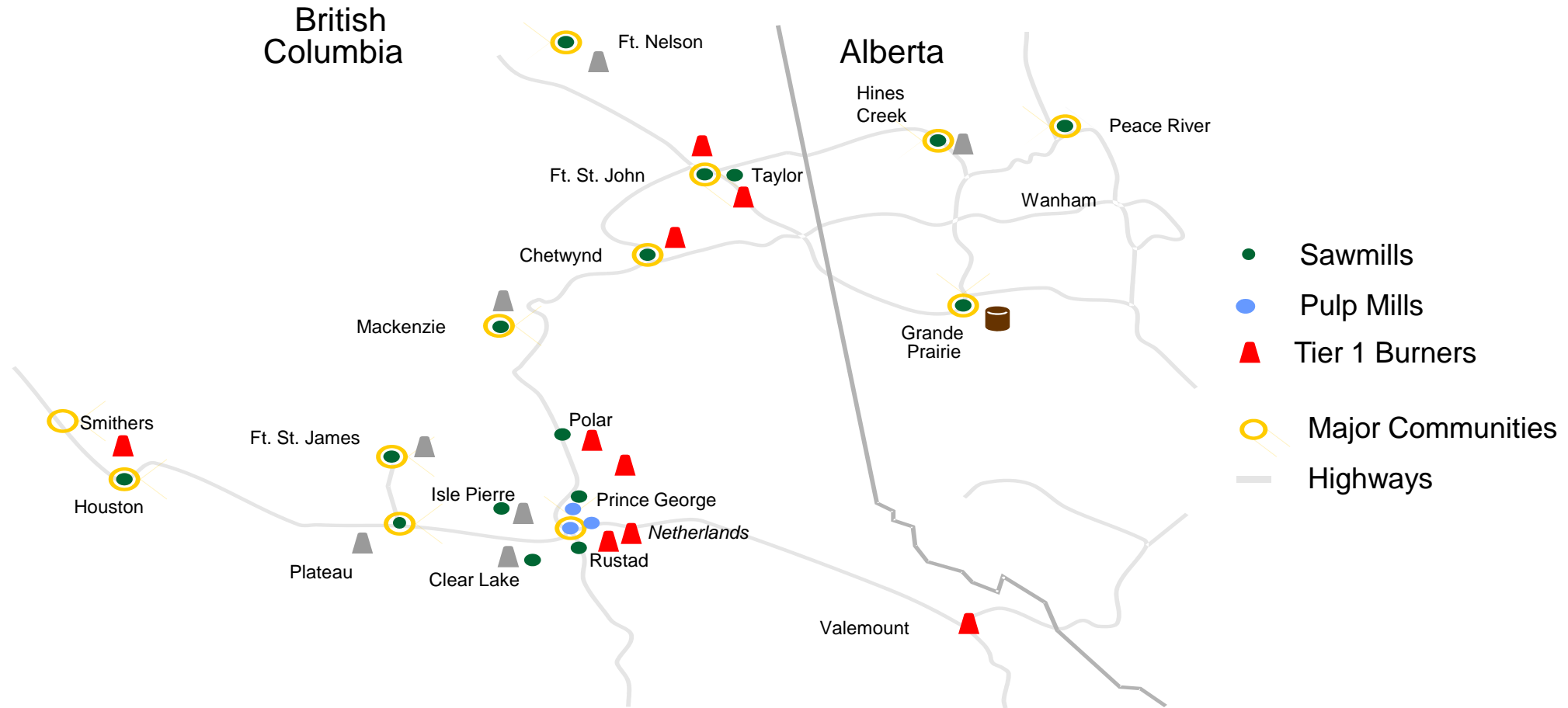
## Product Yields on a Solid Wood Basis



# BC Beehive Burners and Incinerators ~2005



# Canfor Historical Beehive Burners and Incinerators





# Beehive Burner at Night



# Canfor Houston Beehive Burner Meets its End (May 2007)



# Beehive Burner - Malakwa





# Renewable Energy



## Heat

- All but our recently acquired Wynndel mill in the East Kootenays are heat energy self sufficient
- Seven of 10 biomass heat energy systems at our BC mills are units constructed by Prince George based Deltech Manufacturing Inc.





# Renewable Energy



## Combined Heat and Power

- We own and operate a 25 MW capacity Combined Heat and Power Plant in Alberta that supplies our adjacent sawmill with renewable electricity and steam heat for lumber drying in addition to selling renewable electricity to the Alberta Power Pool



## Wood Pellets



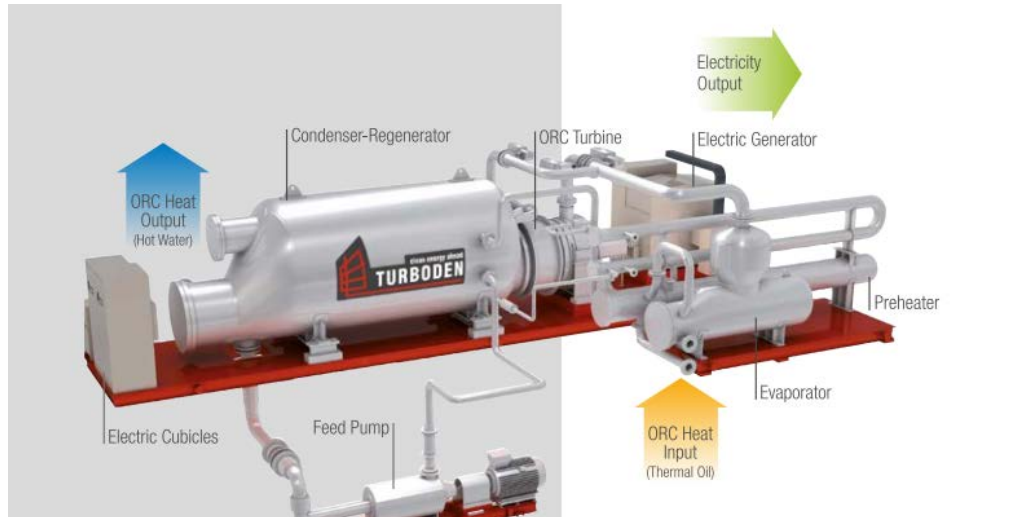
- We started up two wood pellet plants early this year, one in Fort St. John with a capacity of 70,000 t/year of pellets and the other in Chetwynd with a capacity of 110,000 t/year
- Pellets from these plants are bound for Asian markets where they are co-blended with coal to meet renewable portfolio standards and reduce greenhouse gas emissions
- Our 220,000 t/yr pellet plant joint venture with Pinnacle Pellet in Houston BC which started up in fall 2006 sells wood pellets to a Japan utility and coal power plants in Europe

# Renewable Energy



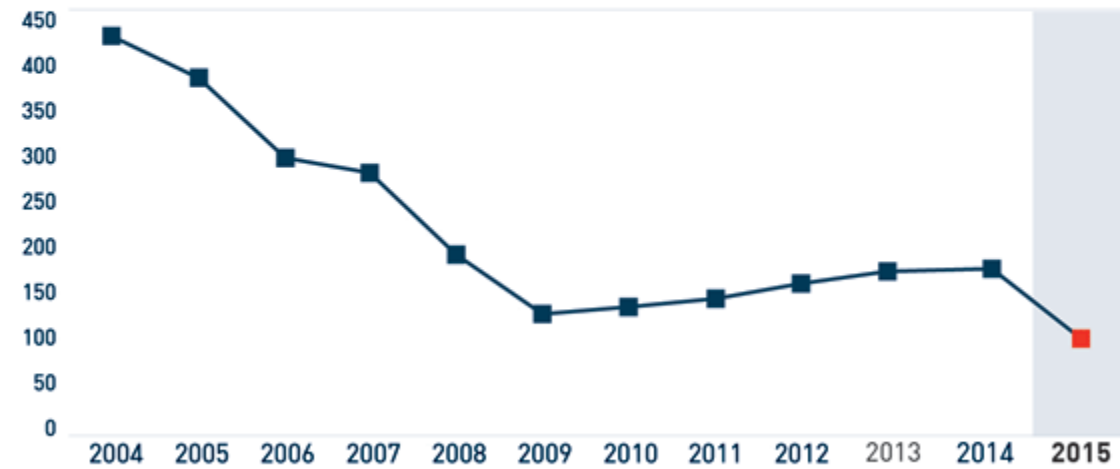
## Chetwynd Pellet ORC

- The Chetwynd Pellet Plant has two bark fired Deltech heat energy systems which supply thermal oil to a Turboden Organic Rankin Cycle generator which generates up to 3MW of electricity displacing the pellet plant load and some of the sawmill electrical load
- Waste heat from the ORC generator is used to dry sawdust for the pellet plant in a low emission belt dryer



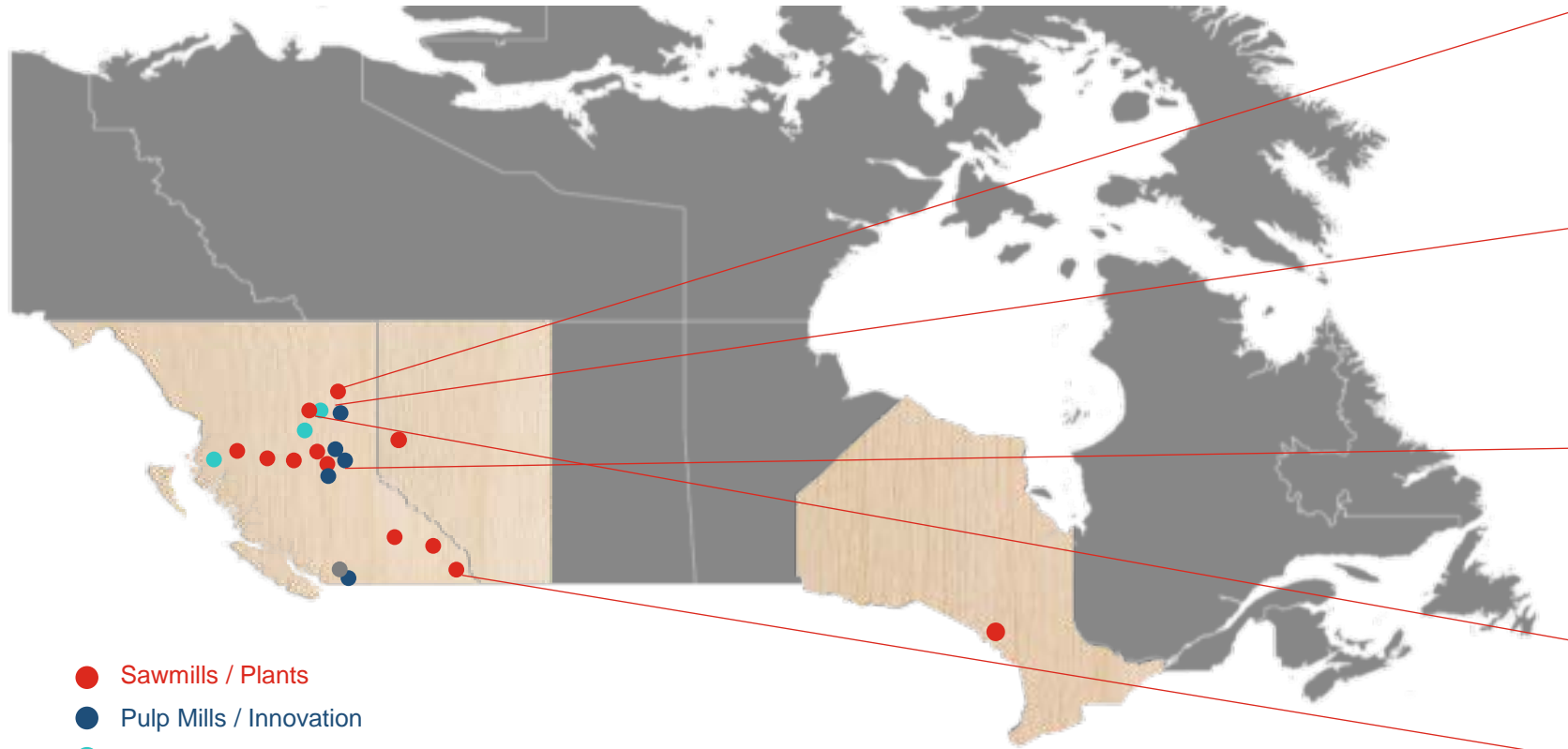
## CANFOR GREENHOUSE GAS EMISSIONS

KiloTonnes CO<sub>2</sub>e





# Canfor Fuel Switch Offset Project Locations



- Sawmills / Plants
- Pulp Mills / Innovation
- Green Energy
- Head office



**Fort St. John**



**Chetwynd**



**Prince George**



**Mackenzie**



**Elko**

**Five of our ten BC sawmills are selling offset credits to the CIB**

# Fort St. John Sawmill Heat Energy System





# Schematic Fuel Storage Bin to Energy System Units

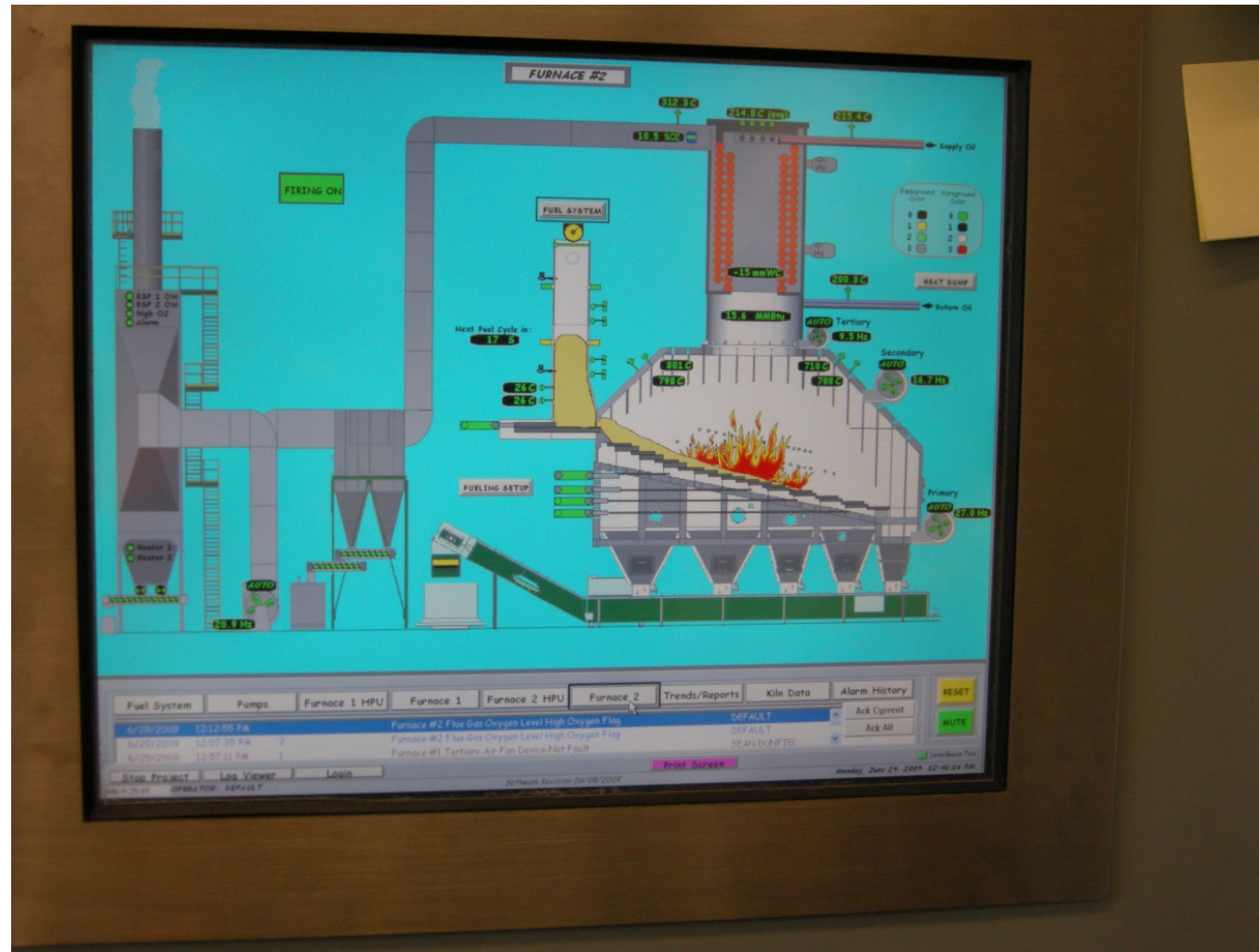


# Biomass Fuel in Storage Bin

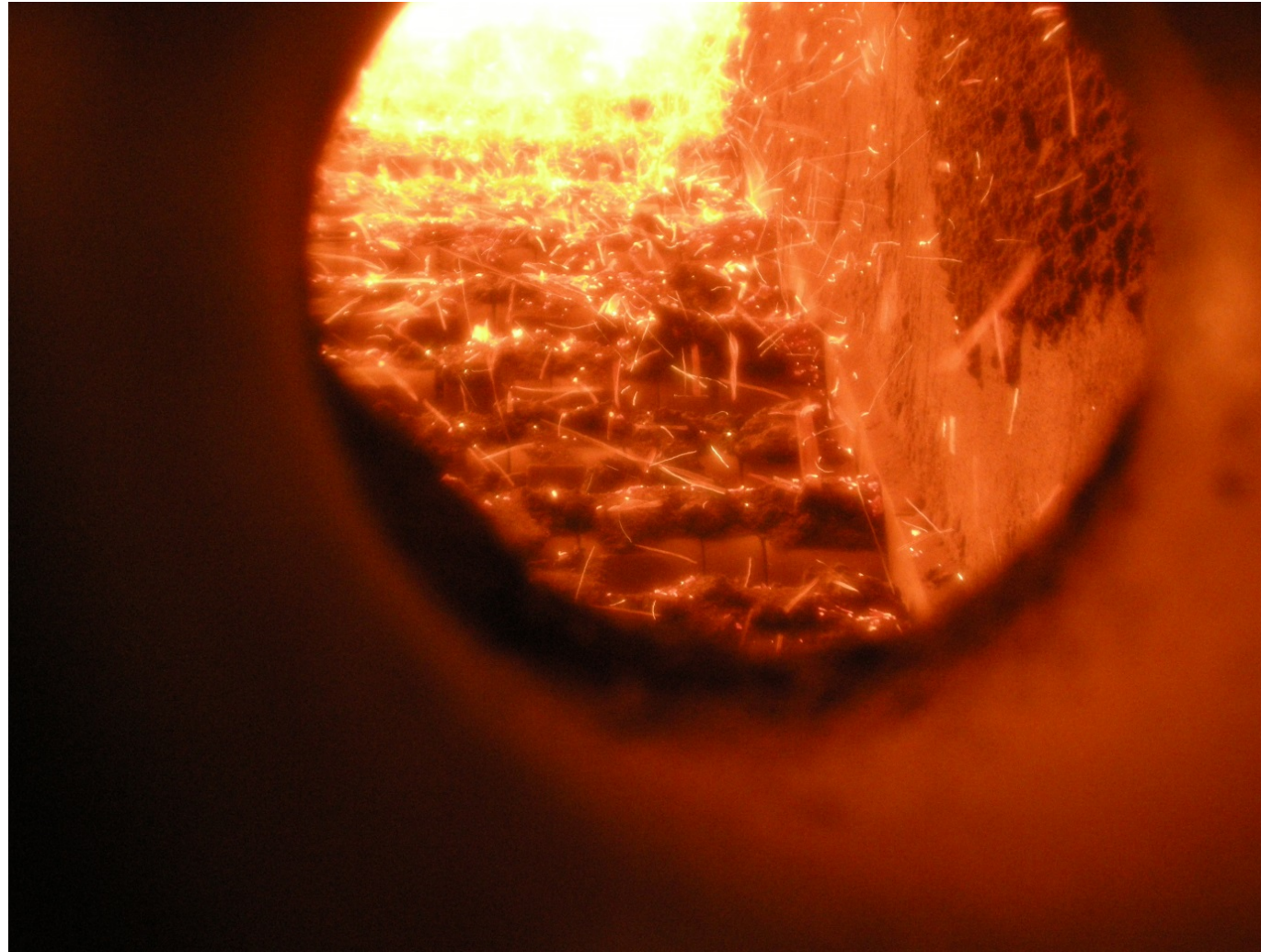




# Operator Control Screen Ft. St. John Energy System



# Efficient Combustion in Stepped Grate Combustor





# Thermal Oil Heat Transfer to Lumber Dry Kilns



# Fort St. John Offset Project



## PID

PROJECT SUMMARY

Overview

PID Submission Date	[11, 19, 2014]
Project Title (ISO-14064-2: clause 5.2 a, BC-EOR: Section 3, subsection 2a)	Biomass Fuel Switch - Canadian Forest Products Ltd. – Fort St John BC
Sectoral scope(s) applicable to the Project (ISO 14064 2: 5.2 b):	Scope 1
AFOLU (Agriculture, Forestry and Land Use) Project category and activity type (if applicable)	n/a
Is the Project a program of activities? ("grouped projects," that are structured to allow the expansion of a project activity subsequent to validation under the same Project Plan)	n/a

Project Purpose and Objectives

Provide a summary description (maximum two page – further detail is requested later in the PID) of how the Project is expected to generate GHG Reductions. Include the following:

a description of key project sources, sinks, and reservoirs;

technologies and processes; and

the Baseline Scenario including key sources, sinks and reservoirs.

Expected Lifetime of the Project	25 Years
Expected Validation Period	[May 7, 2009] to [May, 6, 2019]
Proposed average price per tonne CO2e over contract period:	\$ 15

## Agreement

OFFSET PURCHASE AGREEMENT

Between

HER MAJESTY THE QUEEN IN RIGHT OF BRITISH COLUMBIA, as represented by the Minister of Environment (the “Province”)

and

Canadian Forest Products Ltd./Produits Forestiers du Canada Ltée (“Vendor”)

Dated May 14, 2015  
2015 14

Contract # OA15JHQ-113E



# Fort St. John Offset Project



## Project Plan

## Validation



Canfor Fort St. John Fuel Switch – GHG Project Plan

October 18, 2010

PREPARED ACCORDING TO THE REQUIREMENTS OF THE BC EMISSIONS  
OFFSET REGULATION.

## **ISO 14064 Validation Engagement Report for the Canfor Fort St. John Fuel Switch – GHG Project Plan dated October 18, 2010**

**October 18, 2010**

The information in this report is confidential and may be legally privileged. It is intended solely for the use of the intended recipients, Offsetters Clean Technology, Inc., Canadian Forest Products Ltd. and the Pacific Carbon Trust. Access to this report by anyone else is unauthorized. If you are not the intended recipient, any disclosure, copying, distribution or any action taken or omitted to be taken in reliance on it, is prohibited and may be unlawful. Any opinions contained in this report are subject to the terms and conditions expressed in the governing KPMG PRI client engagement contract.



## Quantification

### GHG emissions reductions methods and assumptions

The baseline condition for the project is the consumption of natural gas used for heating kilns to dry lumber produced by the Fort St. John sawmill and for sawmill space heating.

The project activity involves installation of a heat energy system employing a biomass burner and a hot oil/heat exchanger system to utilize sawmill residues to heat oil which:

- replaces natural gas as the source of heat for the kilns; and,
- is planned to replace natural gas as the source of heat for space heating in the sawmill.

GHG emissions reductions are claimed from the substitution of fossil fuels with thermal energy generated by burning waste biomass.

Because the heat energy system is also used to dispose of excess sawmill residues, some of the heat generated by the system is wasted. As a result, direct measurement of biomass consumption or heat generated would not provide an accurate measure of the energy used by the kilns. To estimate the baseline energy use, Offsetters developed a model to calculate the additional natural gas that would have been required to run the kilns (and space heating) in the absence of the heat provided by the heat energy system. The model uses kiln production and heating degree days as the primary inputs to determine the kiln energy requirements and hence the amount of natural gas that would have been required to dry the lumber.

### 5.6 EMISSIONS REDUCTION

Table 3: Emissions Reduction

	A	B	C (A-B=C)
Year	Baseline Emissions (tCO <sub>2</sub> e)	Project Emissions (tCO <sub>2</sub> e)	Emissions Reduction (tCO <sub>2</sub> e)
2015	16,133	1,839	14,295
Total	16,133	1,839	14,295

# Fort St. John Offset Project



## Verification

### Emission Offset Project Report

Prepared according to B.C. Ministry of Environment Climate Action Secretariat Emission Offset Project Report Template Version 1.0 January 2008

Emission Offset Project Report Title:	Canfor Fort St. John Sawmill Verification 7 Fuel Switch GHG Project Report Version 1.2 May 19, 2016
Project Proponent:	Canadian Forest Products Ltd.
Document prepared for:	CCMCA Program Director Climate Action Secretariat PO Box 9455 Stn. Esplanade Victoria, BC V8W 9W6
Document prepared by:	Offshore Clean Technology 1000-675 West Hastings St. Vancouver BC V6B 1N2 Contact: Simon Phillips Phone: 778-945-0222
Date:	May 19, 2016

File name: FR-Canfor FSJ- Ruby Canyon-May 19, 2016

Page 1 of 12

## Verification Statement

Emission Offset Project Report	Canfor Fort St. John Sawmill Verification 7 Fuel Switch GHG Project Report Version 1.2
Project Report Period	January 1, 2015 to December 31, 2015
Intended User of Document:	This report has been prepared for Canadian Forest Products Ltd. and the BC Ministry of Environment, Climate Action Secretariat for the express purpose of facilitating the issuance of offset units under the <i>Greenhouse Gas Industrial Reporting and Control Act</i> (the Act) and the Greenhouse Gas Emission Control Regulation (the Regulation).
Document Prepared by:	Phillip Cunningham Ruby Canyon Engineering, Inc. 743 Horizon Ct., Suite 385, Grand Junction, CO 81506 USA 970.241.9298 ext. 13 pcunningham@rubycanyoneng.com
Date:	March 24, 2016
[Reference/Project/Number]	No Project Number

# Fort St. John Offset Project



## Transfer of Offsets

### EXHIBIT C

#### TRANSFER FORM

This Assignment and Transfer Agreement (this “**Transfer**”) is dated July 8, 2016 and is between **Her Majesty the Queen in Right of British Columbia**, as represented by the Minister of Environment (the “**Province**”) and Canadian Forest Products Ltd. (“**Vendor**”).

WHEREAS pursuant to an Offset Purchase Agreement between the Province and Vendor made as of May 25, 2015 (the “**Offset Agreement**”), Vendor agreed to sell, convey, assign, transfer and set over to the Province certain Project Offsets (as that term is defined in the Offset Agreement).

NOW, THEREFORE, IN CONSIDERATION of the mutual promises contained in the Offset Agreement and this Transfer, the Province and Vendor agree as follows:

#### 1. TRANSFER AND ASSIGNMENT.

Vendor hereby absolutely and irrevocably grants, sells, conveys, assigns, transfers and sets over all of Vendor’s right, title, interest, property, claim and demand in and to the following Project Offsets that are the Offset Units (as such term is defined in the *Greenhouse Gas Industrial Reporting and Control Act*, S.B.C 2014, c. 29) described below to the Province:

Project Report Period (Contract Vintage)	Project and Address	Quantity (tCO <sub>2</sub> e)	Serial Numbers (if available)
Jan 1 2015 - Dec 31, 2015	Fort St. John Fuel Switch Project	14,295	BCO-BCO-CA- 104000000011316-01012015- 31122015-1984562-1998856- MER-0-P



# Canfor Carbon Offset Sales in BC



		Capital Cost	Reductions to end 2015
	Project Start	millions \$	tCO <sub>2</sub> e
Ft St John	May-09	13.4	85,345
Mackenzie	May-10	14.4	80,021
Prince George	Feb-11	14.1	48,894
Chetwynd	Oct-11	9.3	50,368
Elko	May-15	11.0	11,776
Total		62.2	276,404

# Canfor Carbon Offset Sales Going Forward



Canfor Offset Projects			
	Minimum Volume	Maximum Volume	Estimated Reductions to end 2017
	tCO <sub>2</sub> e	tCO <sub>2</sub> e	tCO <sub>2</sub> e
Contract Vintage			
2016	47,000	67,000	
2017	47,000	67,000	
Total	94,000	134,000	400,000

# Conclusion

---



- We appreciate the opportunity to sell carbon offsets from several of our fuel switch projects to the BC Government
- Offset Revenue was taken into account in our decision to undertake these projects and together with carbon tax elimination was significant in the ROR on these projects
- We are looking at further innovative GHG reduction projects within Canfor and Canfor Pulp and are excited about the potential opportunity to contribute further to the low carbon economy

*QUESTIONS?*

---