The wood processing industry and wood residues for heat production

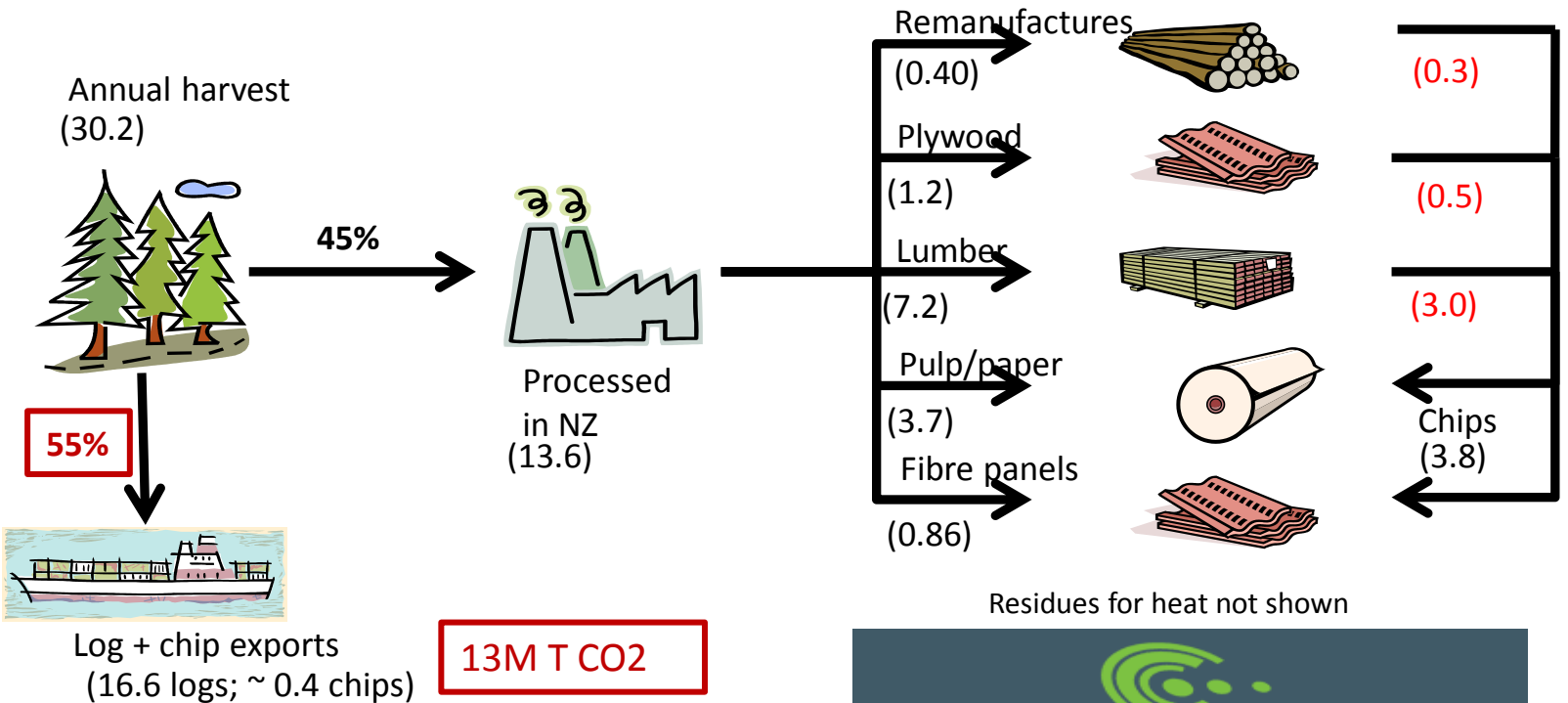
Summary

- Wood processing has a low overall carbon footprint
- Wood processing process heat carbon footprint is very low
- There is potential for significant improvement in renewable process heat percentage via -
  - Large increase in NZ wood processing with little or no carbon footprint increase
  - More residues available to replace fossil fuel in process heat applications in other industries

Agenda

- Wood flows
- Log uses - value chain
- Residues for heat production
  - Volumes
  - Cost structure
- Process heat footprint
- Potential for improvement in renewable process heat percentage

NZ Wood Flows (million m^3 roundwood equivalent) 2014



Residues for heat not shown

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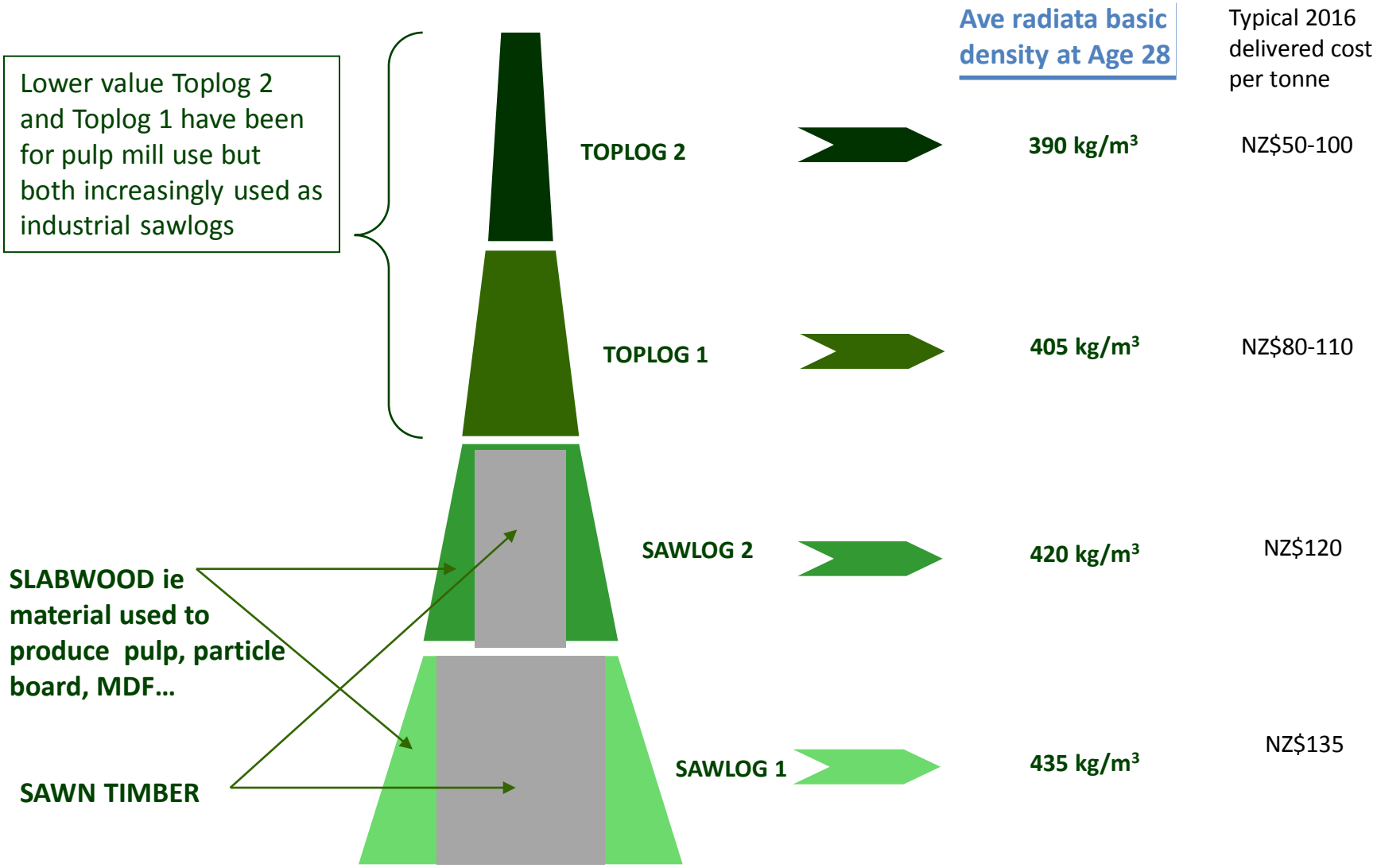
Utilisation of typical CNI radiata tree as harvested today



Secondary residues for heat 2020-2030 Woodco strategic plan - sources, volumes

Lumber , ply processing plants

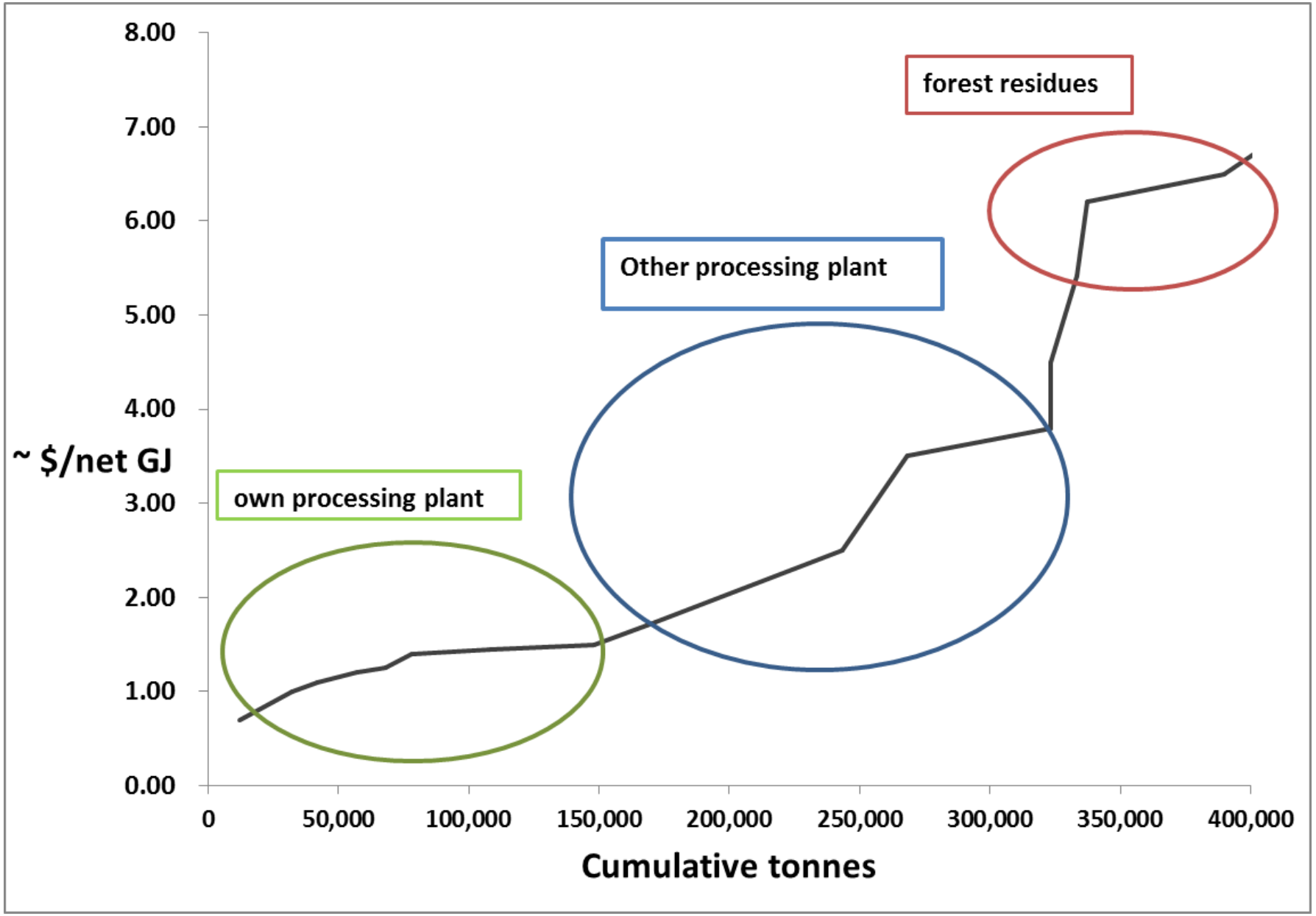
Material		Volume (M m^3)	Net PJ
sawdust, bark, shavings etc	Total produced	2.2	15
	Available for external use	~ 0.6	**~ 4**

Forest floor BUT AT WHAT COST??

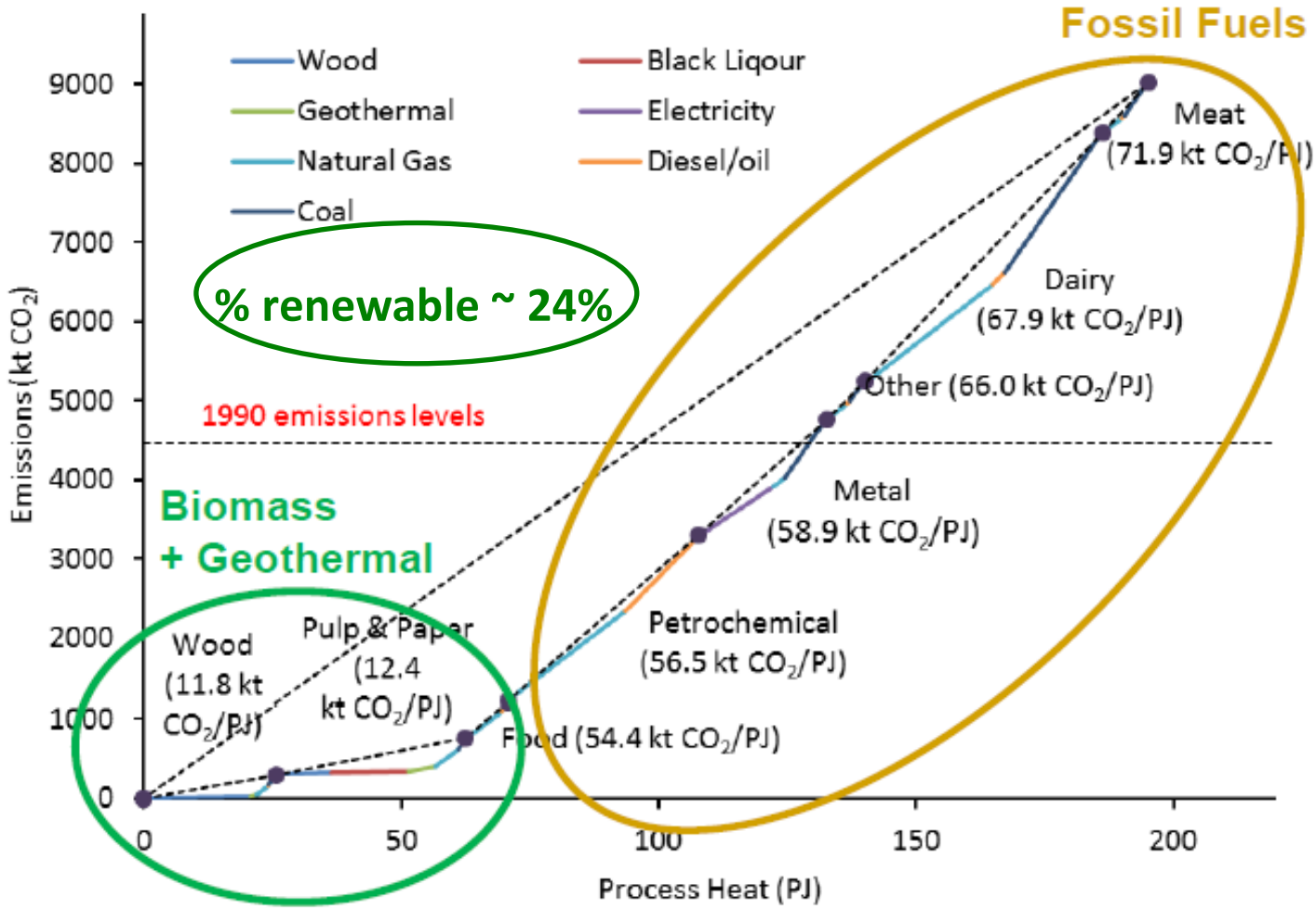
Source	Volume (M m^3)	Net PJ
Skid	~ 1.4	**~ 10**
Floor	~ 1.7	**~ 12**

Notes:
Woodco plan 50% increase in processing at improved energy efficiency
Residue volumes source – Scion very approximate
Volumes are assessed practical retrieval volumes – 100% skid, 50-70% floor

Secondary residues cost curve



Process Heat use by Industry and Fuel Type in 2014



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Future Scenarios of Wood Energy for Emission Reduction

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Future Scenarios (WPMA)

Scenario 1:

- Wood harvest increases by ~ 50%
- Wood processing and pulp & paper production increases by 50% @ 80% energy intensity (i.e. 20% more energy efficiency) using black liquor and wood derived fuels (zero emission increase).

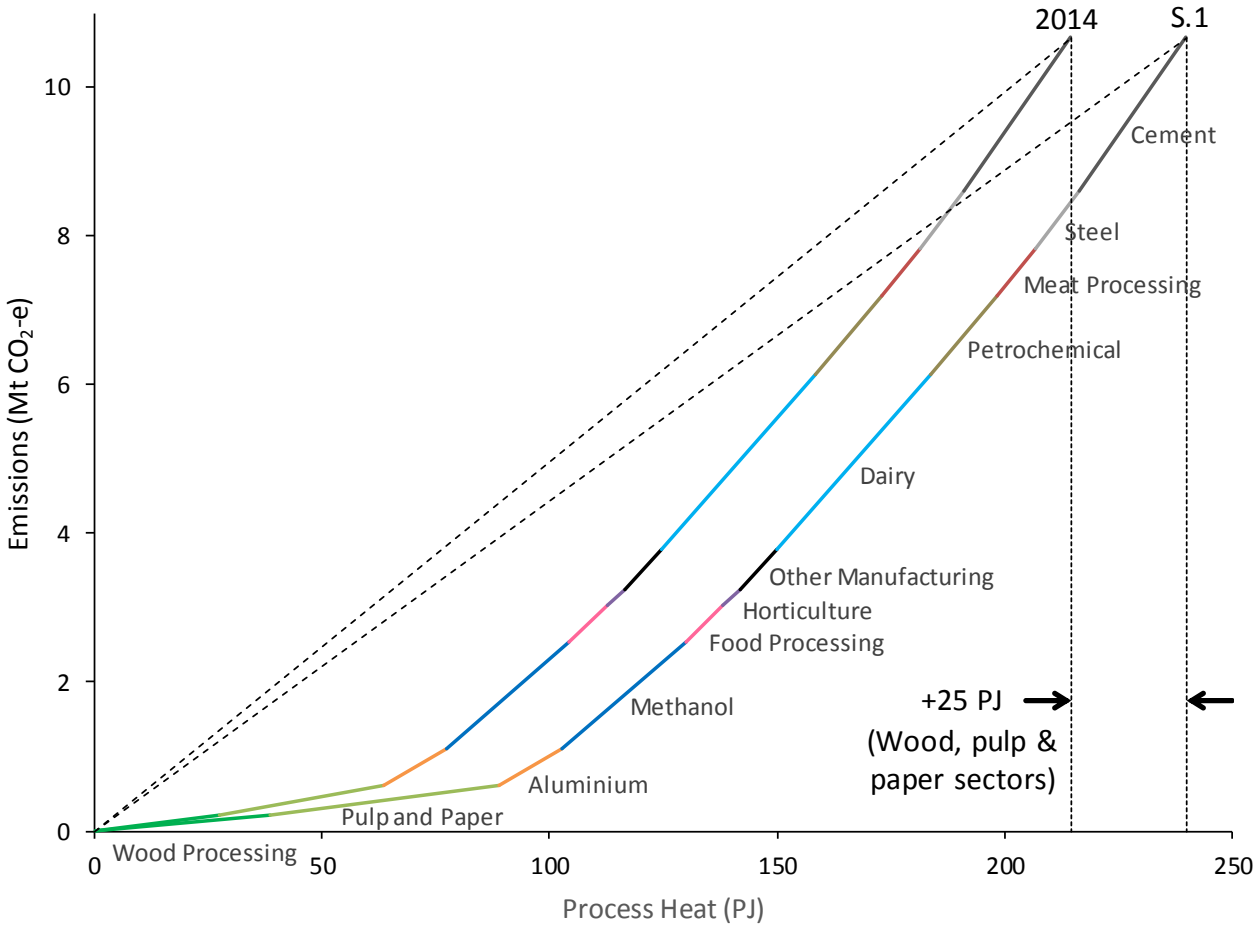
Scenario 2:

- Scenario 1 +
- 4 PJ of excess residues from wood processors available to dairy processing, substitution for coal

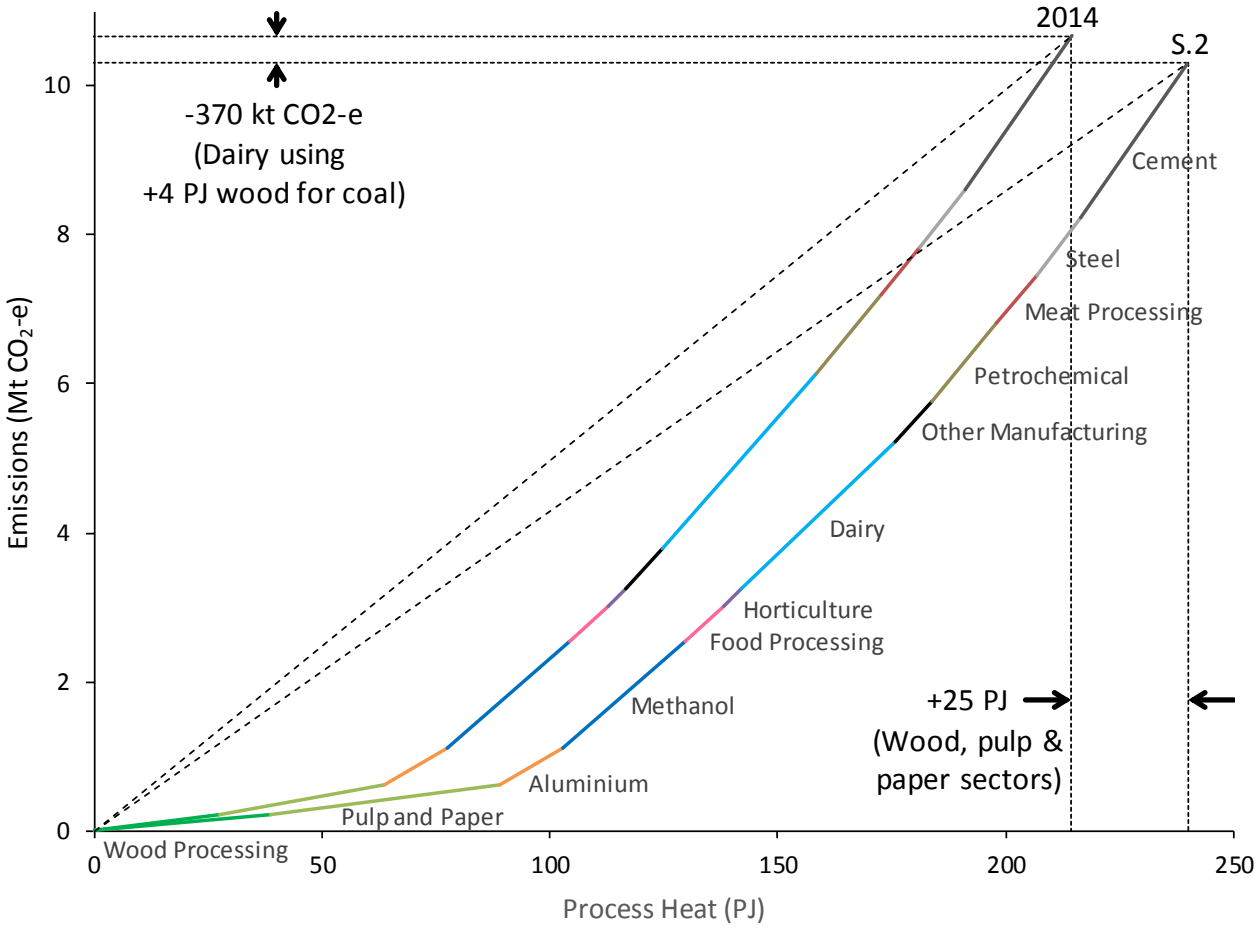
Scenario 3:

- Scenario 2 +
- 10 PJ of wood from residues from forest logging skid sites available to dairy processing, substitution for coal

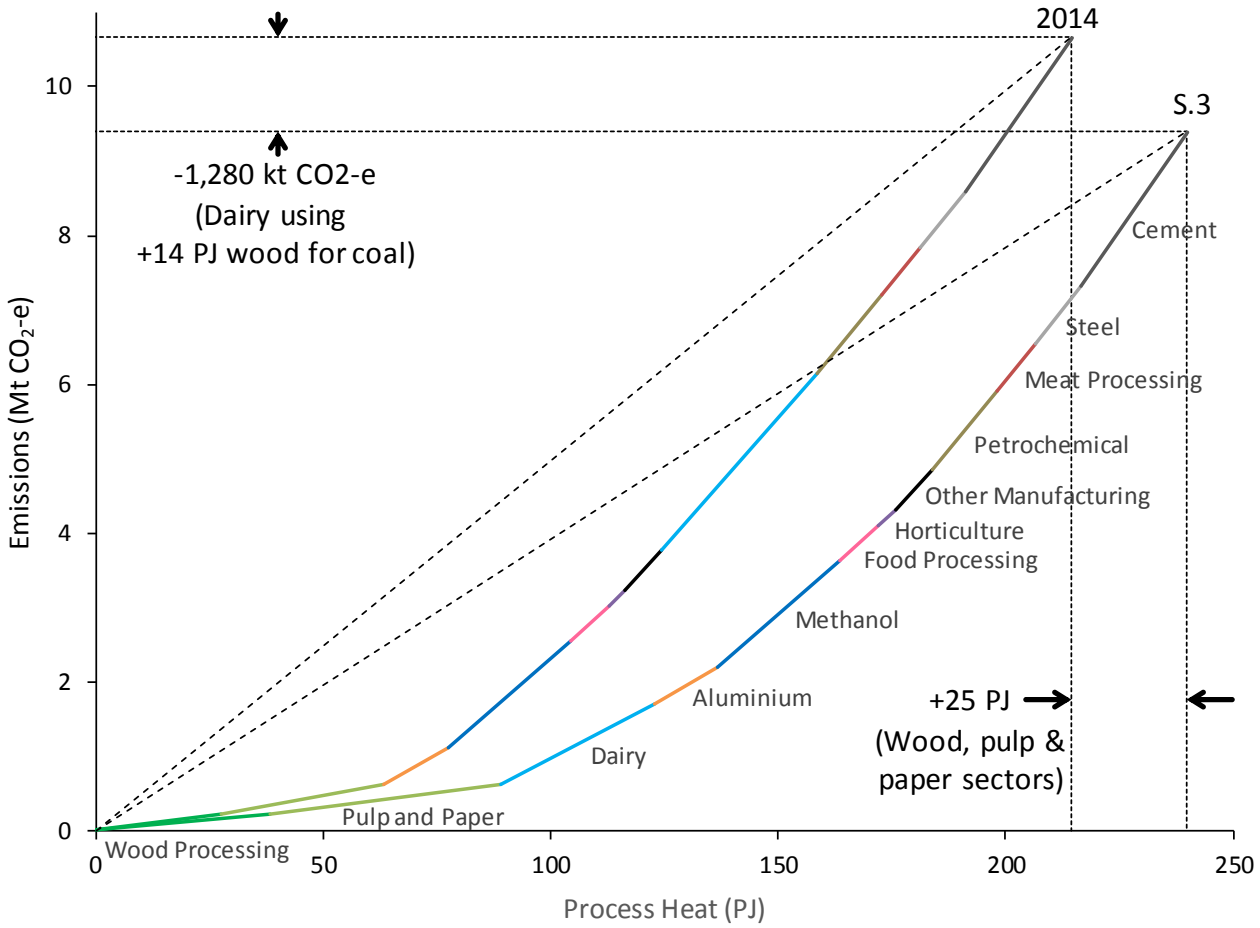
Scenario 1


2014
S.1
Emissions (Mt CO_2-e)
Process Heat (PJ)
0
2
4
6
8
10
0
50
100
150
200
250
Wood Processing
Pulp and Paper
Aluminium
Methanol
Food Processing
Horticulture
Other Manufacturing
Dairy
Petrochemical
Meat Processing
Steel
Cement
+25 PJ
(Wood, pulp & paper sectors)

Scenario 2


2014
S.2
-370 kt CO2-e
(Dairy using
+4 PJ wood for coal)
Cement
Steel
Meat Processing
Petrochemical
Other Manufacturing
Dairy
Horticulture
Food Processing
Methanol
Aluminium
Pulp and Paper
Wood Processing
+25 PJ
(Wood, pulp &
paper sectors)
Emissions (Mt CO_2-e)
Process Heat (PJ)
0
2
4
6
8
10
0
50
100
150
200
250

Scenario 3


2014
S.3
-1,280 kt CO2-e
(Dairy using
+14 PJ wood for coal)
Emissions (Mt CO_2-e)
Process Heat (PJ)
0
2
4
6
8
10
0
50
100
150
200
250
Wood Processing
Pulp and Paper
Dairy
Aluminium
Methanol
Horticulture
Food Processing
Other Manufacturing
Petrochemical
Meat Processing
Steel
Cement
+25 PJ
(Wood, pulp &
paper sectors)

Conclusion

- Increasing wood processing in NZ will have a significant impact on process heat renewable percentage
- Improvement from ~24% to ~36% renewable is possible via
  - 100% renewable heat used in additional wood processing
  - Additional wood energy available for other industries.
- PLUS other advantages – exports, regional focus, low carbon content products

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