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Wood Fuelled Heat Plant Operators Forum

What we've learned about operating wood fuelled plant

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Pioneer EFI- Wood Fuelled Plants

Winstone Pulp
Biomass Boiler

Nelson Hospital
Partnership

Bromley Energy Centre

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COFELY GDF SUEZ

Christchurch District
Energy Joint Venture

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Washdyke District
Industrial Heating

Silver Fern Farms
Biomass Boiler

Dunedin Energy Centre
and District Heating

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Wood Fuelled Assets

7MW Residues and Sludge Heat plant

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Wood Fuelled Assets

Fuel and combustion system

- Dewatered sludge and imported residues
- Dewatering sludge to 50% dry solids by coagulation and centrifuging to create fuel value

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Wood Fuelled Assets

12 MW Residues and Sludge Heat plant

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10 MW Wood Chip and Residue Boiler

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4 MW Seasoned Wood Chip Boiler

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7 MW Wood Chip Conversion

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Wood Fuelled Assets

500 kW Wood Chip Boiler

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- Pulp Logs
- Billet wood
- Forest Residues
- Wood Hubs in Dunedin, Naseby and Christchurch
- Supplying both EFI plants as well as other customers

What We've Learned……

Operating Commercial Wood Energy Plant

- Some wood energy fundamentals
  - Wood Energy economics in NZ
  - Carbon Benchmark – CEMARS and Bioenergy Assoc Accreditation
- Fuel Supply
- Fuel Handling
- Optimising Operation and Tuning
- Fuel Switching considerations at Dunedin Energy Centre

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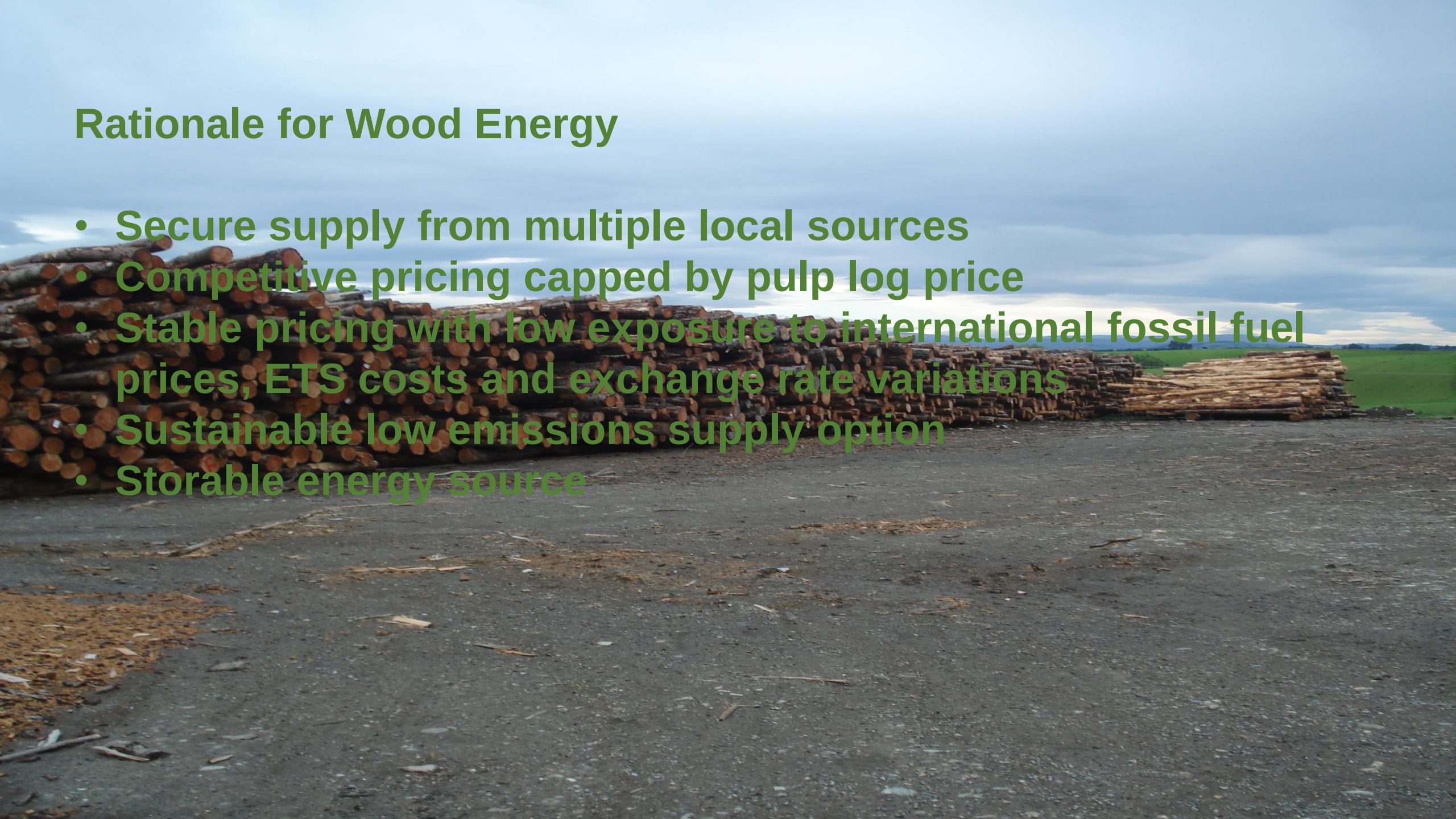
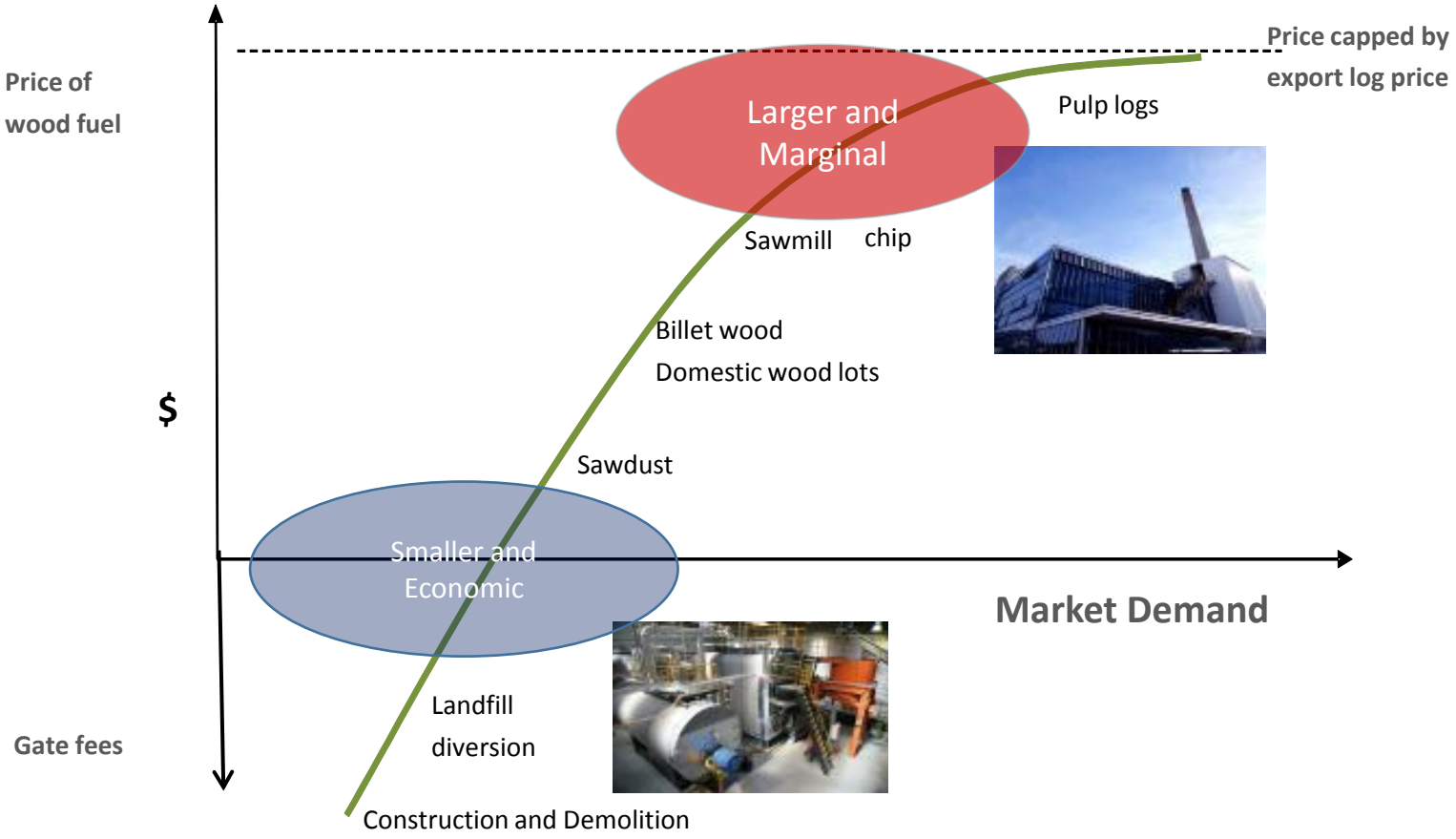
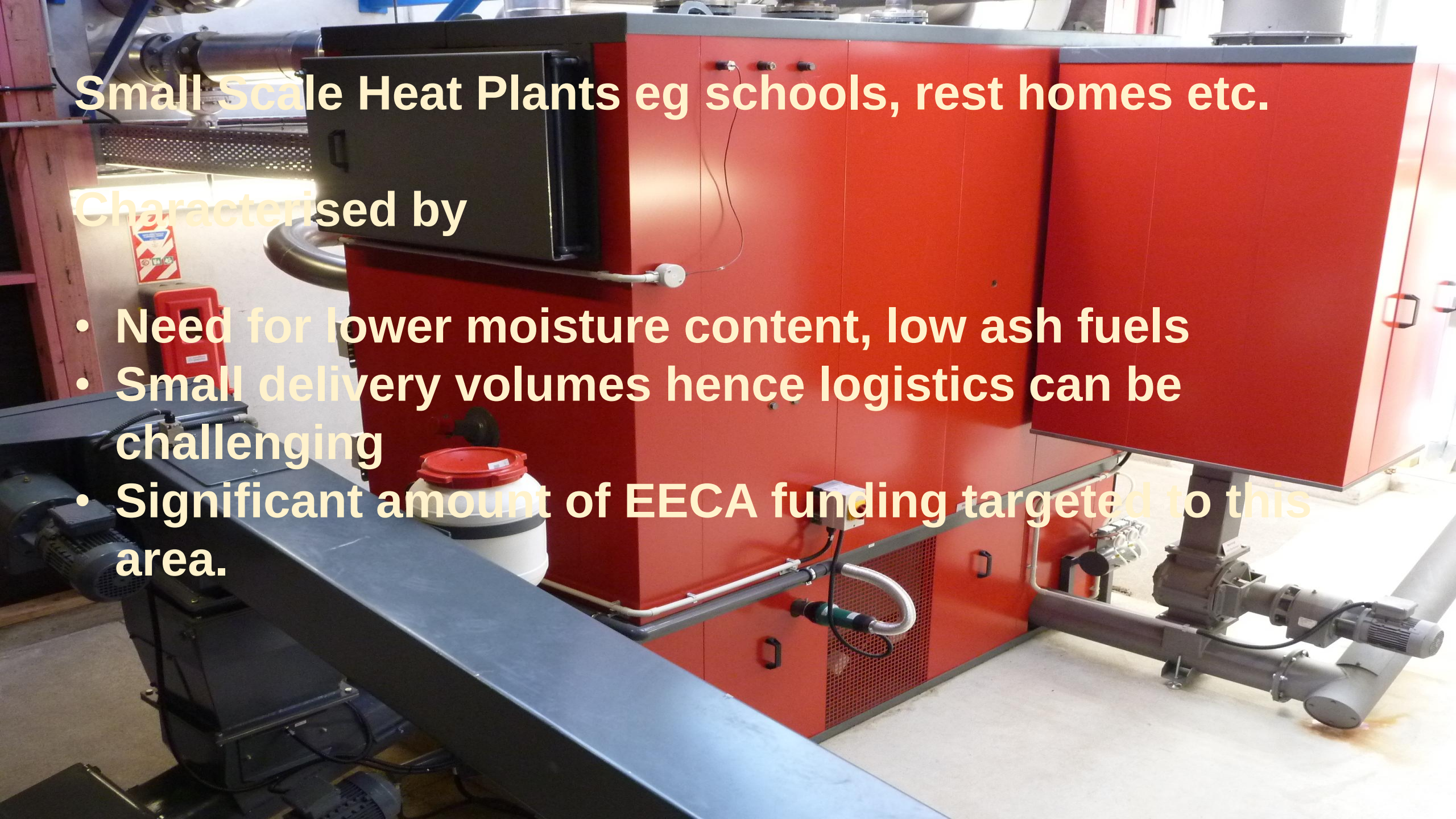


Rationale for Wood Energy

- Secure supply from multiple local sources
- Competitive pricing capped by pulp log price
- Stable pricing with low exposure to international fossil fuel prices, ETS costs and exchange rate variations
- Sustainable low emissions supply option
- Storable energy source

Wood Energy Economics in NZ





Small Scale Heat Plants eg schools, rest homes etc.

Characterised by

- Need for lower moisture content, low ash fuels
- Small delivery volumes hence logistics can be challenging
- Significant amount of EECA funding targeted to this area.

Carbon Benchmarks

Accredited framework for companies to measure and manage their greenhouse gas emissions.

Accredited framework for companies to leverage their natural competitive advantage

Fuel Supply

- Consistent fuel supply is key to efficient plant Operation
  - Constant supply
  - Size
    - Oversize Material
    - Undersize (Dust)
  - Clean
    - Free from dirt, stones etc
    - Tramp metal
  - Process Waste (Bark, Saw Dust, Shavings etc)
    - Seasonal Variations

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Fuel Quality

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Fuel Quality

Fuel Handling

- Access can be difficult for a supplier
- Consider truck access and safe unloading
- Conversions of existing coal systems require consideration (increased volumes)
- Sensible storage capacity enables practical delivery intervals

Converting a Coal Boiler – Issues and Solutions

- Boiler rated capacity limited by the fuel feed rate from the spreader stoker type feeders
- Minor operational issues associated with the use of wood fuel in equipment designed to operate on coal

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Converting a Coal Boiler

Co-firing Considerations:

- Reliability & operability of boiler & fuel handling
- Fuel availability and reliability of supply
- Supply logistics and storage
- Cost of fuel , opex costs associated with wood
- Operators acceptance of wood (culture)
- Our customers view on wood as an alternative fuel

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Our Five Key Learnings

- Fuel Matching
- Technology
- Fuel Quality
- Fuel Handling
- Safety and Training

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