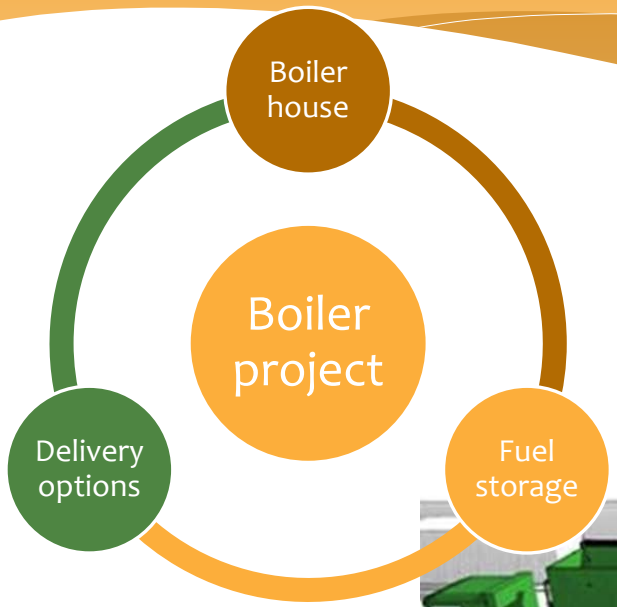
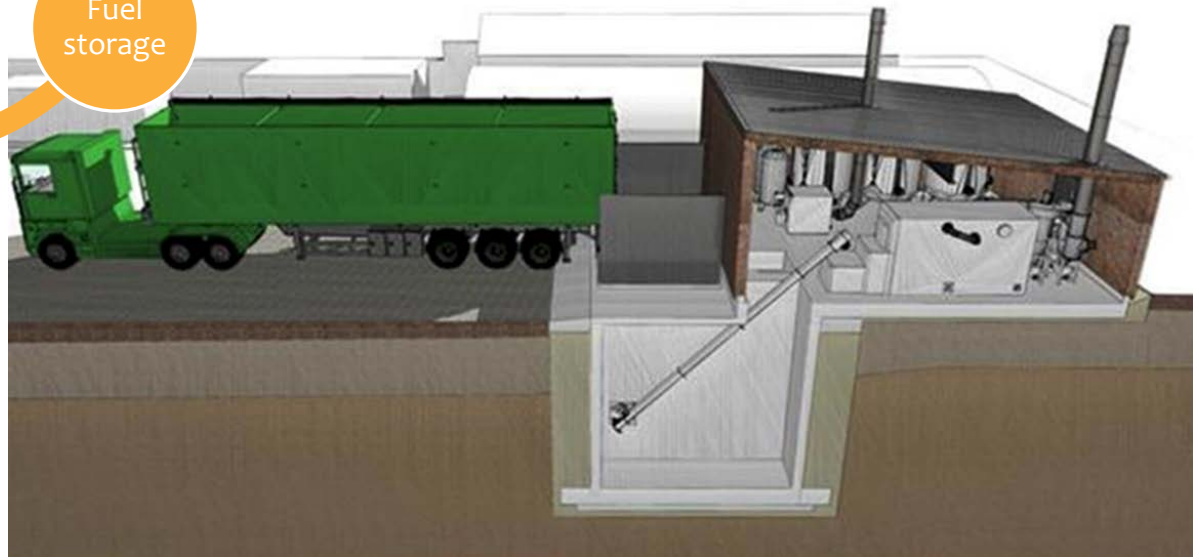
Retrofitting boilers into existing systems

WOOD ENERGY SOUTH

Venture Southland
Business, Tourism, Community & Events

What I will be talking about





Correctly sizing a boiler

Boilers are oversized

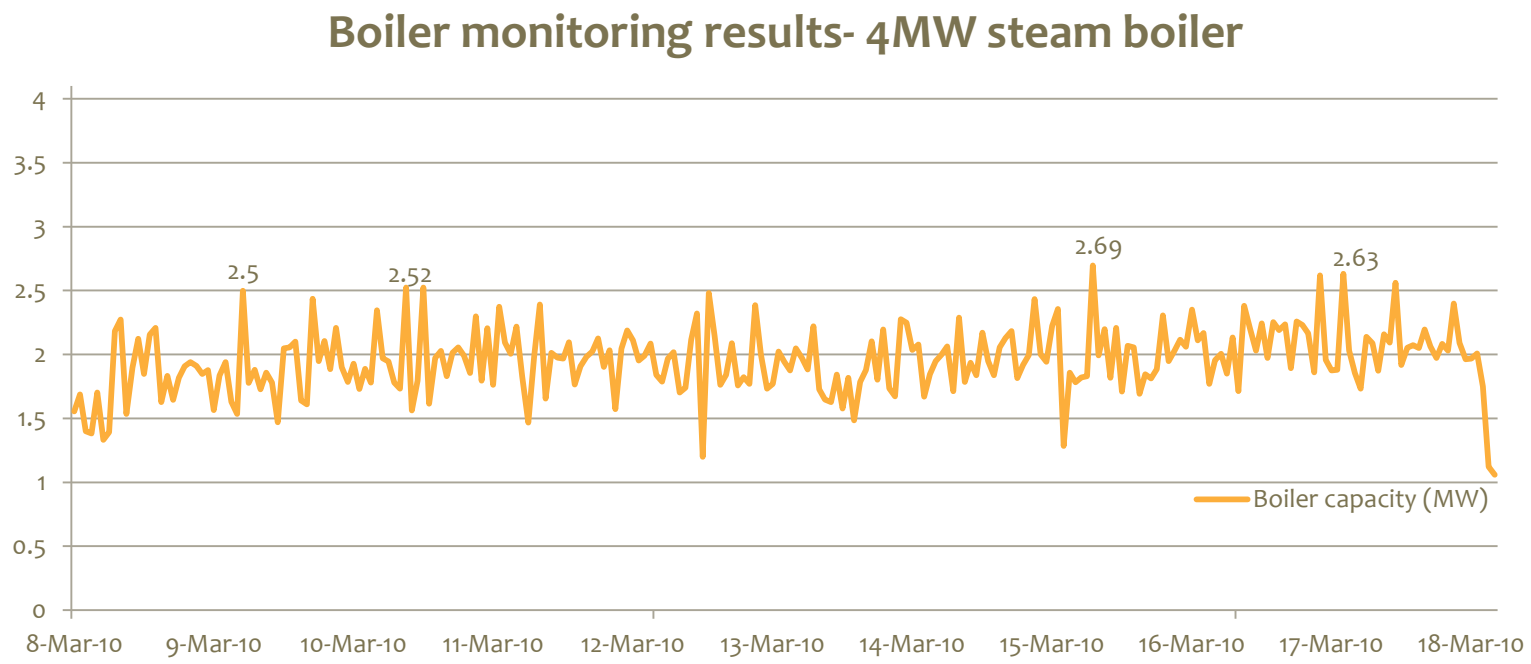
* Future production and expansion
* Change in site processes
* Poor design
* Risk adverse
* Cheap energy
* Safety factors

Need to estimate load profile

* Heat meter
* Fuel consumption

Example boiler monitoring

- Need to ensure monitoring or analysis is a fair representation of your process



Example boiler oversizing

Fuel storage- how much do I need to store?

* Peak demand energy usage determines daily, weekly or monthly fuel volumes
* Need to allow for weather interruptions
* Vehicle delivery capacities
* 5-10 days supply onsite

Fuel delivery and storage

Vehicle considerations

What types of vehicles are available

* Speak with suppliers to determine the types of loads available
  * Chip liners (80-100 cum)
  * V bin trucks (30-40 cum)

Site access

Fuel delivery systems

Vehicles


The truly renewable
fuel for your business
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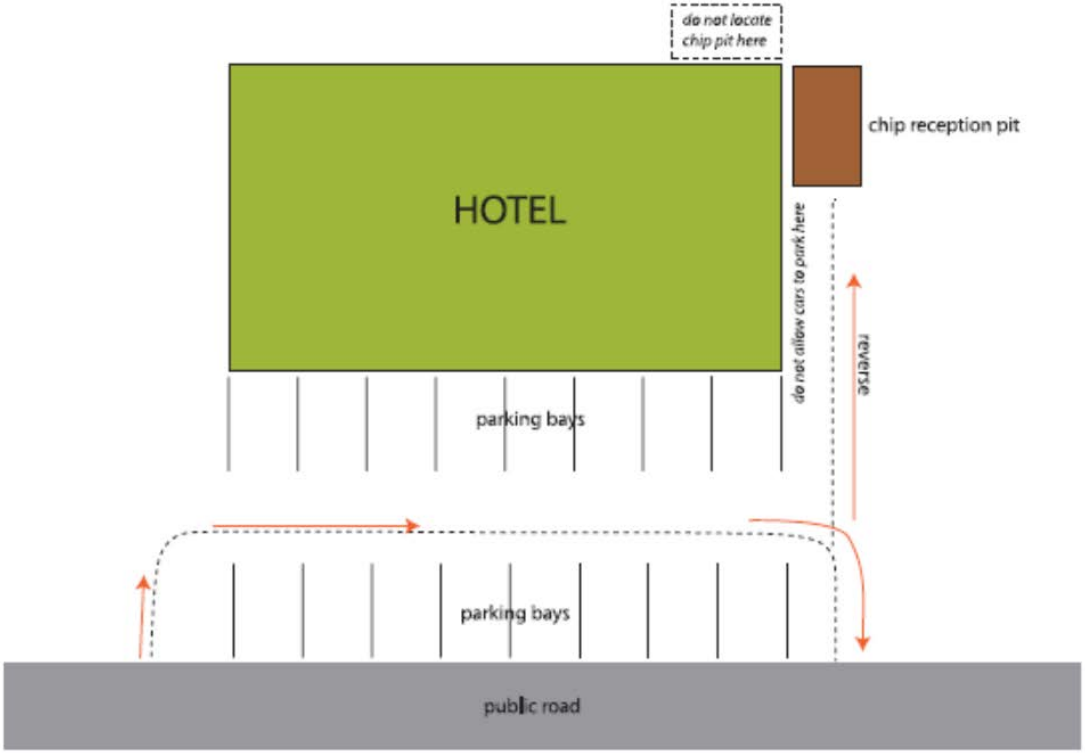
mcneill Distribution
HINO


ISUZU
wenz

Site access

Site access


do not locate chip pit here
chip reception pit
HOTEL
do not allow cars to park here
reverse
parking bays
parking bays
public road

Fuel delivery options

- Coal conversions are naturally well set up for woodfuel
- Tipping into a lower level store (especially existing coal pit) is most cost effective
- Restricted sites may require special delivery systems which can be expensive

Fuel delivery to converted coal bunker

Sides amended to improve flow of fuel

Above ground delivery options

Trough delivery options

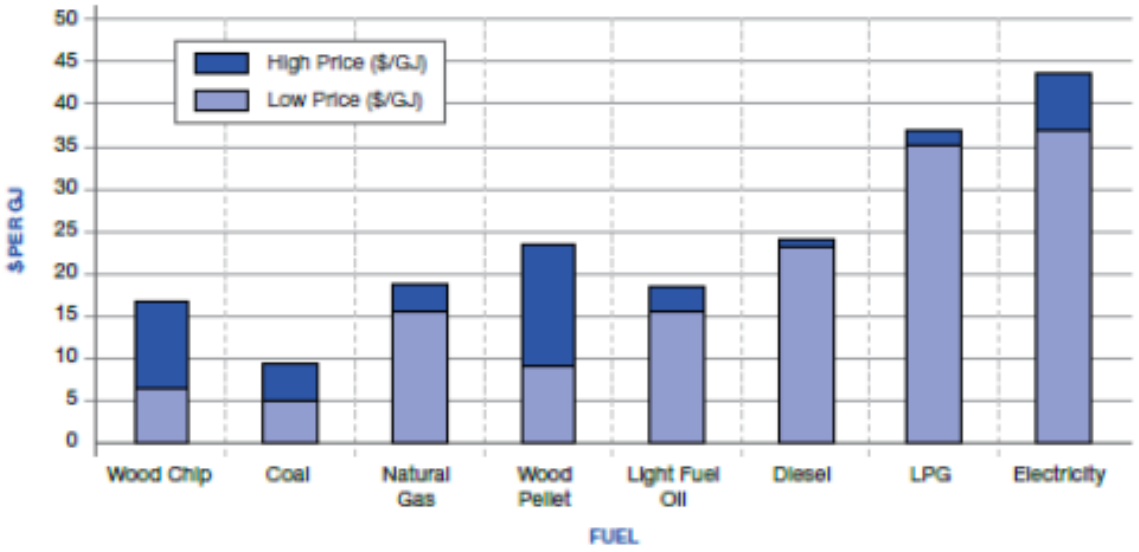
Considerations for storage bunker

* Auger jamming
  * How do you clear a jammed auger?
  * How do you replace an auger
* Maintenance of sweeping arm system
  * Common to fill voids in bunker with chip rather than build false floor
* Emptying the bunker
  * Access points high and low
* Ventilation

Considerations for storage bunker

Fuel prices

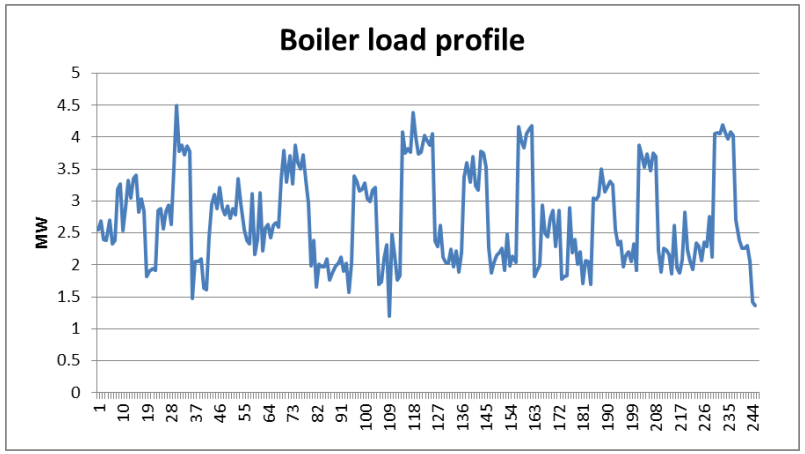
FIGURE 1: COMPARATIVE FUEL COSTS

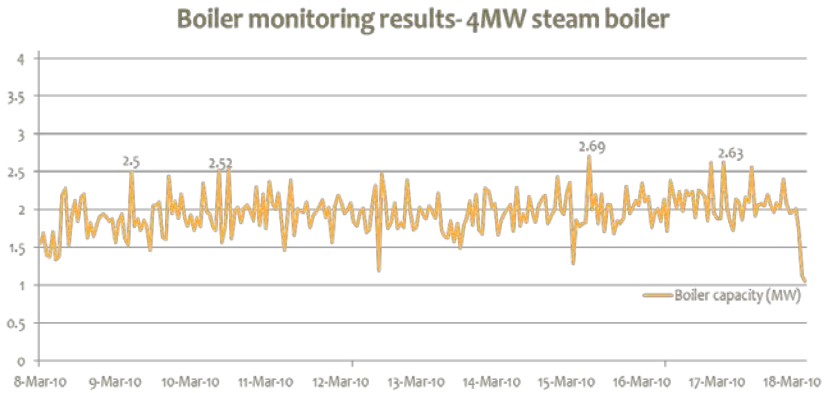


(Pricing information is based on EECA monitoring and the Ministry of Economic Development's New Zealand Energy Data File 2009 Commercial Prices)

Back up boilers and peak loading

* Wood boilers are as reliable as fossil fuel boilers
* If space permits retain existing LPG or diesel boilers for back up supply during maintenance
* Need to understand your load profile





Accumulator tanks

* Commonly used for biomass systems
* Improves boiler short cycling
* Allows boiler to operate more continuously for longer periods
* Allows boiler to operate efficiently during low demand
* Come in all shapes and sizes
* 10,000 l at 40deg Δ T = 500 kWh or 500kW for 1 hour

Energy efficiency

* Reduce demand onsite
  * Heat recovery opportunities
    * Chillers/refrigeration
    * Compressors
    * Solar
    * Insulation
    * Flue gas heat recovery
* What is going on around you?
  * Are there any other waste heat streams available?

Questions

Thank you

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