Adding value to spent livestock resources using

THERMAL ENERGY.

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Pre-Feasibility

Appropriate Location ?

Biomass Supply ?

Accessible Thermal Technology ?

Off-take Guarantee ?

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Pre-Feasibility

Appropriate Location ?

Yes. Poultry & Pork farms have appropriate space for a thermal process.

Retro-fit or Greenfield.

Sheds per farm.

Distance and topography.

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Pre-Feasibility

Biomass Supply ?

Yes. Spent Poultry & Pork bedding is on site
 - with the use often determined by the farm manager.

Minimal freight cost.

Free of material and chemical contamination.

Opportunity cost of material for other purposes ?

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Pre-Feasibility

Biomass Supply ?

HRL Project Code :	67160007	**Client Name :**	Clean Carbon
HRL Job Number :	171010	**Client Contact :**	Greg Butler

Job Number: 171010	**Chicken Litter**
	171010-1
Ash Yield	
Ash Yield	22.0 % (db)
Total Moisture	
Moisture	25.6 % (ar)
Volatile Matter	
Fixed Carbon	14.7 % (db)
Volatile Matter	63.3 % (db)
Calorific Value (CV)	
Gross Dry Calorific Value	15.7 MJ/kg (db)
Gross Wet Calorific Value	11.7 MJ/kg (ar)
Net Wet Calorific Value	10.4 MJ/kg (ar)

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Pre-Feasibility

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With gas price of $9 per GJ, the poultry litter has an equivalent raw energy value of $93.60 per tonne.

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Pre-Feasibility

Accessible Thermal Technology ?

Yes. An EPA compliant thermal energy plant that converts poultry litter, pork litter and biosolid to thermal energy does exist.

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Images courtesy of ECOREMEDY

Pre-Feasibility

Off-take Guarantee ?

Yes. Monetise the investment by reducing heating & cooling cost.

Carbon Credit opportunity if fuel switching.

Other emissions reductions (such as CH4 > CO2)

Ash has P, K nutrients.

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Field trip to Flintrock Farms (poultry).

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Images courtesy of
ECOREMEDY

Oxidation
1200°C

Gasification
600°C

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Images courtesy of
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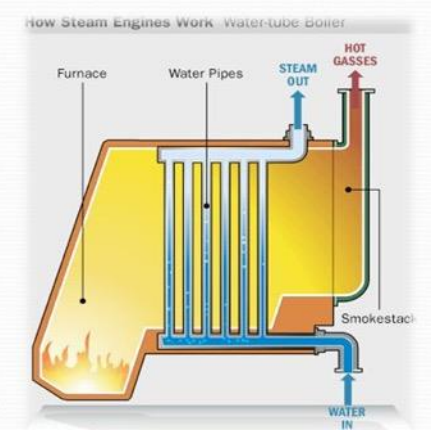
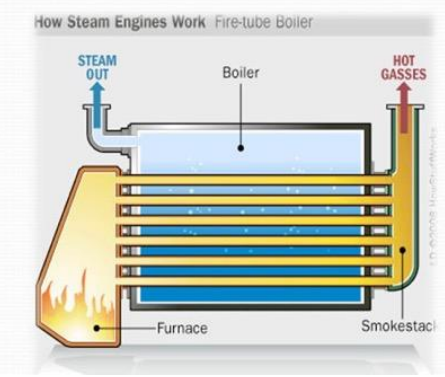
Boiler

Demand cycle.

Water-Tube & Fire-Tube

Attended & Unattended





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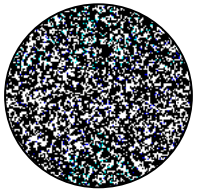
Products from the Boiler

- Heat exchange (Hot Thermal)
  - Hot water much simpler and cost effective than steam.
- Absorption Chiller (Cold Thermal)
  - The efficiency driven by the temperature of the heat source.
- Steam Turbine (Electricity)
  - Efficiency driven by steam pressure.
- Ash / Biochar
  - Ash is unavoidable / Biochar is a potential choice.



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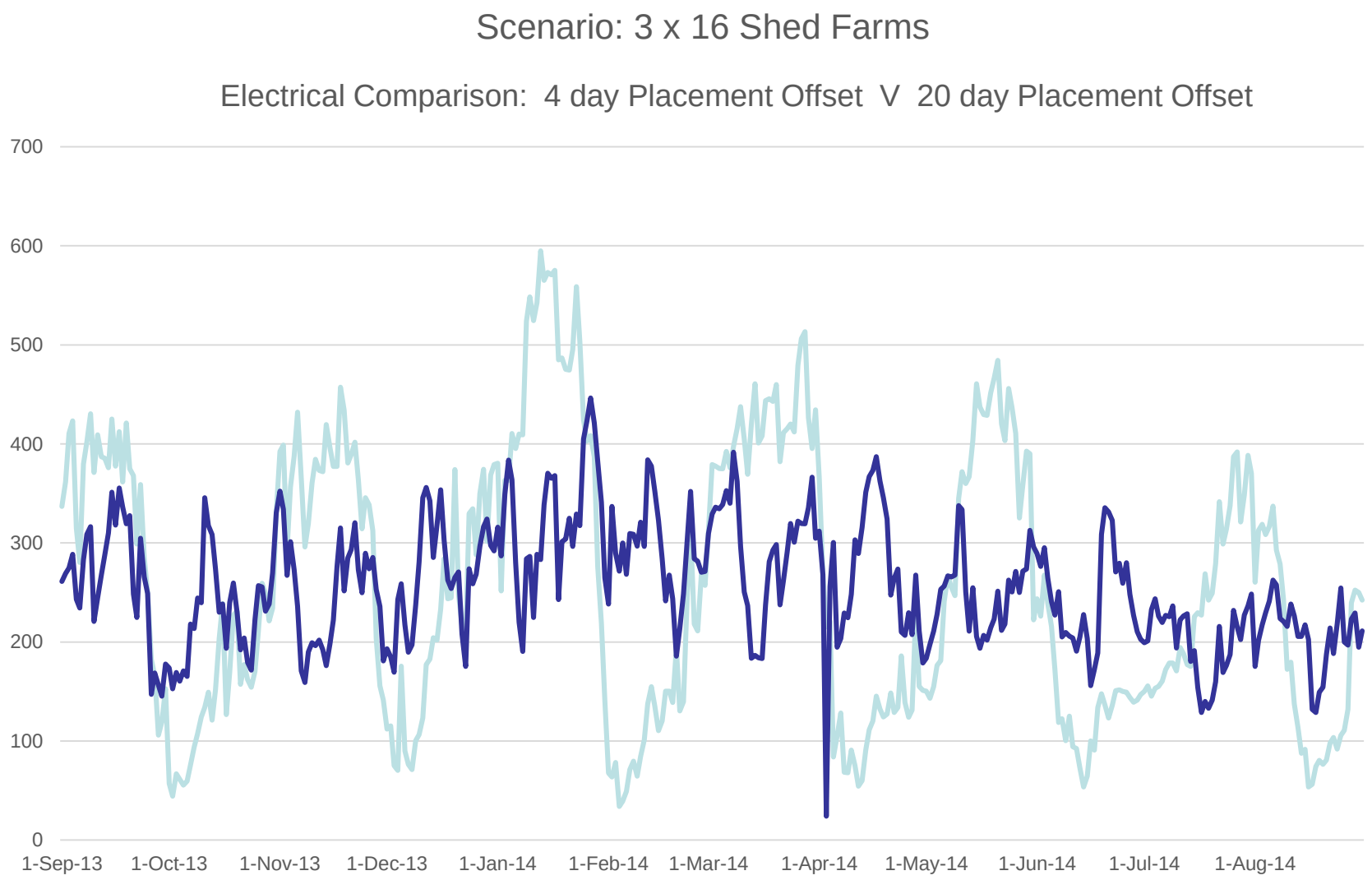
Demand Cycles



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Moving thermal energy.

Performance is excellent.
Cost related to distance and topography.

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Hydronic Heating

- ↓ CO_2
- ↓ Moisture

Hydronic Chilling

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Images courtesy of
ECOREMEDY

Collateral benefits with gasifier:

- Tolerance of comingled and variable feedstock.
  - size, moisture, calorific value.
- Bio secure disposal of mortalities.
- ERF Credit for renewable fuel switching.
- Potential to produce biochar.

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Cost challenges

Levelized cost of electricity [LCoE]

- Anaerobic digestion is heavily incentivised in the UK
  - Needs to be, as LCoE is around £160/MWh (~ AUS $281)
- Large scale combustion plants are around £35-40/MWh ($62-70)
- An optimistic LCoE for ATT is £50/MWh plus (~$88)

Dr Stuart Wagland, Senior Lecturer in Energy and Environmental Chemistry.
Australian Waste to Energy Forum: Ballarat, 20th February 2018.

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More Information:

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