Main Themes

- What Determines the Height of an EfW building?
- The Relationship between size and Generation Efficiency
- The Relationship between size and economics
What Determines Building Height?

1) Boiler Capacity

2) Building Design

The Boiler

- Steam Drum
- 850°C for 2 seconds
- Ammonia Injection
- Waste Bunker
- Exhaust Gases
Inside the Combustion Chamber

- Start Up Burner
- Secondary Air Nozzles
- Boiler nose
- Refractory Lining
- Moving grate

Height and Capacity

- 50 ktpa: 4 cms
- 100 ktpa: 5 cms
- 200 ktpa: 6.3 cms
Influence of Building Design

Riverside

Cleveland

Lakeside

Newhaven
Isle of Man Plant

Rookery South RRF
<table>
<thead>
<tr>
<th>EFW Plant</th>
<th>Total Capacity (1000tpa)</th>
<th>No. of Streams</th>
<th>Capacity per Stream (1000tpa)</th>
<th>Height (metres)</th>
<th>Height if Adjusted to Rookery Capacity</th>
<th>Technology Supplier</th>
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<tbody>
<tr>
<td>Jersey</td>
<td>105</td>
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<td>53</td>
<td>38</td>
<td>58</td>
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<tr>
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<td>35</td>
<td>50</td>
<td>Fisia Babcock (Noell grate)</td>
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<td>Von Roll</td>
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Efficiency

The larger the plant, the higher the generation efficiency

This is because, as capacity increases:

- boiler heat loss per tonne/hour of waste decreases
- steam turbine efficiency increases
- thermal cycle efficiency increases

Steam Turbine
**Typical Net Generation Efficiencies**

- Small plants, 50 to 100 ktpa: 16% to 19%
- Medium plants, 100 to 300 ktpa: 19% to 24%
- Large Plants, >300 ktpa: 21% to 27%
- Coal fired power plants: ca. 34% (Electricity delivered to local grid)

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**Economics**

The larger the plant, the lower the gate fee.

This is because, as capacity increases:

- Cost per tonne/hour (of waste) decreases
- Power output per tonne/hour increases
- Number of operators needed per tonne/hour decreases
- Cost of maintenance per tonne/hour decreases
Thank you