UK Green Investment: Commercial Opportunity, Low Carbon Challenge and Sustainable Delivery

Master Class: Waste

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Section 1
Introduction to GIB Waste & Bioenergy team
Our vision: green and profitable

Our task: crowding-in capital

Our markets:

- Offshore Wind
- Waste & Bioenergy
- Energy Efficiency
### SUMMARY OF WASTE & BIOENERGY TRANSACTONS

**GIB’s Waste Bioenergy team and FM’s have invested c.£415mn across 16 transactions**

To date, 84% of team’s investment in Waste sector have been in PFI/PPP transactions vs Merchant projects

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Sector</th>
<th>Direct Investments (£m)</th>
<th>Fund Investments (£m)</th>
<th>Fund manager</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>GIB capital</td>
<td>Total capital mobilised</td>
<td>GIB capital</td>
</tr>
<tr>
<td>Derby Waste PPP</td>
<td>Waste and bioenergy</td>
<td>64.0</td>
<td>127.0</td>
<td>–</td>
</tr>
<tr>
<td>Estover Speyside</td>
<td>Waste and bioenergy</td>
<td>13.0</td>
<td>74.0</td>
<td>–</td>
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<tr>
<td>Willen anaerobic digestion project</td>
<td>Waste and bioenergy</td>
<td>–</td>
<td>–</td>
<td>7.4</td>
</tr>
<tr>
<td>Northern Ireland on-farm AD: Bridge Energy</td>
<td>Waste and bioenergy</td>
<td>–</td>
<td>–</td>
<td>1.5</td>
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<tr>
<td>Northern Ireland on-farm AD: PAR Renewables</td>
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<td>–</td>
<td>–</td>
<td>1.7</td>
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<tr>
<td>Norfolk waste PFI</td>
<td>Waste and bioenergy</td>
<td>51.2</td>
<td>226.0</td>
<td>–</td>
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<tr>
<td>Birmingham BioPower gasification plant¹</td>
<td>Waste and bioenergy</td>
<td>12.0</td>
<td>35.7</td>
<td>5.6</td>
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<tr>
<td>Merseyside waste PFI</td>
<td>Waste and bioenergy</td>
<td>20.0</td>
<td>335.5</td>
<td>–</td>
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<td>West London waste PFI</td>
<td>Waste and bioenergy</td>
<td>20.0</td>
<td>223.7</td>
<td>–</td>
</tr>
<tr>
<td>Evermore waste to energy plant³</td>
<td>Waste and bioenergy</td>
<td>20.2</td>
<td>81.3</td>
<td>–</td>
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<tr>
<td>Wakefield Waste PFI</td>
<td>Waste and bioenergy</td>
<td>30.4</td>
<td>121.7</td>
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<tr>
<td>Drax biomass conversion</td>
<td>Waste and bioenergy</td>
<td>100.0</td>
<td>990.0</td>
<td>–</td>
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<tr>
<td>Greenlight anaerobic digestion project</td>
<td>Waste and bioenergy</td>
<td>–</td>
<td>–</td>
<td>7.8</td>
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<tr>
<td>TEG Biogas plant, Dagenham</td>
<td>Waste and bioenergy</td>
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<td>–</td>
<td>2.0</td>
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<tr>
<td>Gloucester Waste PPP</td>
<td>Waste and bioenergy</td>
<td>46.8</td>
<td>185.4</td>
<td>–</td>
</tr>
<tr>
<td>Port Talbot biomass plant</td>
<td>Waste and bioenergy</td>
<td>–</td>
<td>–</td>
<td>11.3</td>
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<tr>
<td>Greensphere fund initial capitalisation</td>
<td>Waste and bioenergy</td>
<td>30.0</td>
<td>60.0</td>
<td>–</td>
</tr>
<tr>
<td>Foresight fund initial capitalisation</td>
<td>Waste and bioenergy</td>
<td>50.0</td>
<td>100.0</td>
<td>–</td>
</tr>
<tr>
<td><strong>2012-13 total</strong></td>
<td></td>
<td>–</td>
<td>458</td>
<td>2,560</td>
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</tbody>
</table>
Birmingham Biopower’s gasification process is the first of its kind in the UK. GIB has taken a debt and equity position.

Total investment: £47.8m
Derby Waste PPP is the first long term, project financed, municipal gasification plant in the UK. It demonstrates the investment potential of this type of technology.

- Reduction in GHG emissions by 48k tonnes CO$_2$e Equivalent to 22,000 cars off the road
- 12MW Renewable Energy generation. Enough to power 14,000 homes.
- Recycling over 35,000 tonnes of materials per year and diverting over 170kt/year of waste from landfill.
Section 2

UK Waste Market & GIB Residual Waste Report
• **GIB Waste Strategy focuses on municipal element of Household, Industrial and Commercial Waste (HIC)**
• **Total Waste in the UK = approx. 175mn of which 85mn is HIC waste**

![Diagram](attachment:image_url)

*Excludes Construction & Demolition Waste – Total Waste in UK c.175Mt*
HOW WE VIEW THE MARKET?

- **Old World vs New World Split**
- **Key differentiation for PFI/PPP projects vs Merchant projects**

**‘Old’ World**
- WASTE TYPE: C&I WASTE
- PROJECT / CONTRACTUAL STRUCTURE: PFI/PPP
- TECHNOLOGY TYPE: CONVENTIONAL
- TYPICAL FUNDING STRUCTURE: SENIOR DEBT
- GIB TYPICAL FINANCING ROLE: TIER 1 SPONSORS
- RISK PROFILE: LOW

**‘New’ World**
- WASTE TYPE: C&I WASTE
- PROJECT / CONTRACTUAL STRUCTURE: MERCHANT
- TECHNOLOGY TYPE: CONVENTIONAL GASIFICATION / PYROLYSIS - AD
- TYPICAL FUNDING STRUCTURE: EQUITY - MEZZ - SENIOR DEBT
- GIB TYPICAL FINANCING ROLE: TIER 3 SPONSORS
- RISK PROFILE: HIGH

**Old World vs New World Split**
- **Key differentiation for PFI/PPP projects vs Merchant projects**
Differing industry reports had led to confusion in the market as to whether there is over or under capacity of UK EfW treatment and stalled investment in the sector.
• W&B team engage Tolvik Consulting for independent analysis of the UK Waste Sector
Waste management is critical to the UK and where economically viable our residual waste (post recycling) can be turned into energy.

85m tonnes of waste produced in the UK in 2012

21m tonnes of which went to landfill

Waste hierarchy

Landfill should be a last resort
Waste should be recycled
What can’t be recycled could be turned into energy

The UK is getting better

70% drop in waste sent to landfill
26% increase in recycling since 2000

£5bn potential investment opportunity in energy recovery – to deal with the waste left after recycling

This could create up to 6,000 new jobs
and enough renewable electricity to power 1m homes

The equivalent of the electricity requirements of Liverpool and Bristol

Source: GIB 2014 – The UK Residual Waste Market
Section 3

Report in Brief – How to Calculate Gap in the Market?
Other Recovery – *principally refers to Energy for Waste treatment of Residual waste that otherwise would go to landfill*
WASTE ARISINGS EXPECTED TO INCREASE

- GIB/Tolvik modelled a low availability and high availability scenario
- Key forecast assumptions - growth in number of UK households and resource efficiency
• **Household waste recycling rates in the UK have risen dramatically over the last ten years but at c. 44% still significantly lag behind our European peers**

• **We estimate that 37.1 million tonnes of waste was recycled in 2012 and estimate that 44.0-46.8 million tonnes will be recycled by 2020 based on our low and high availability scenarios (recycling range of 50%-64%)**

## UK Recycling Rates

<table>
<thead>
<tr>
<th></th>
<th>Rate</th>
<th>Period</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>England</td>
<td>43.3%</td>
<td>To Jun 13</td>
<td>50.0%</td>
</tr>
<tr>
<td>Scotland</td>
<td>41.2%</td>
<td>To Dec 12</td>
<td>60.0%</td>
</tr>
<tr>
<td>Wales</td>
<td>53.0%</td>
<td>To Sep 13</td>
<td>64.0%</td>
</tr>
<tr>
<td>Northern Ireland</td>
<td>39.7%</td>
<td>To Apr 13</td>
<td>60.0%</td>
</tr>
</tbody>
</table>

## European Recycling Comparables
RESIDUAL WASTE – 3 OPTIONS TO TREAT

- 27.7mn tonnes of Residual Waste in 2012
- There are 3 treatment options
  - MBT / Pre Treatment
  - Export
  - Energy for Waste

**Residual Waste Treatment options**

**MBT / Pre Treatment**
- UK MBT capacity is currently 2.4 million tonnes and it is estimated that with the build out of existing local authority backed projects total capacity will reach 3.6 million tonnes by 2020.
- Pre-treatment is a physical, thermal, chemical or biological process which can include sorting or altering the characteristics of the waste in order to reduce its volume and/or its hazardous nature and improve its potential for energy recovery.
- It is important to avoid ‘double counting’ when analysing pre-treatment facilities – either of waste which is processed at more than one facility or of facilities which are part of a wider supply chain.

**Export**
• 5.2mn tonnes of existing EfW waste facilities currently operating
• 11.9mn tonnes of projected EfW capacity to come on stream by 2020
• Assume 62% probability of development inline with DEFRA
A CAPACITY GAP EXISTS

- A need exists for additional infrastructure in the UK, to 2020
- 22mn-27mn of residual waste available in 2020
- We estimate between 4.0 mn - 7.7 mn tonnes of merchant capacity is required
- This represents a potential investment opportunity of approximately £5 billion
Section 4

Key Takeaways
• **Estimated waste to landfill will drop from 21mn in 2012 or 75% of Residual Waste to 7mn in 2020 – equivalent to 32% of Residual Waste**

• **EfW treatment is expected to rise from 20% to 56%**
• GIB will continue to invest in the Merchant Waste space ➔ There is a Capacity Gap
  o GIB £5bn investment target compares to £8bn for Veolia & £10-15bn at SITA

• GIB will assess a Project’s ability to flex gate fees
  o Why? Levels of exports are increasing and setting prices
  o Why? Generally less waste in the market – pressurising gate fees

• GIB will continue to look at recycling opportunities
  (move up the Waste Hierarchy)