Compact Power puts pyrolysis and gasification to work for sustainable solutions
Company Overview

1. UK company supplying an innovative, proprietary and proven pyrolysis & gasification technology

2. Company successfully listed in April 2002 on the London Stock Exchange’s Alternative Investment Market

3. In-house expertise & associated professionals to address all aspects of project cycle (engineering, financing, planning, etc.)

4. On-going research and development to maintain leadership in advanced thermal recycling

5. Expansion in international markets through partnerships with waste management companies, engineering companies, EPC contractors and project developers
Advantages of Pyrolysis and Gasification

1. Environmental
2. Higher Conversion Efficiencies
3. Compatibility with Recycling
4. Power Revenue (Market Liberalisation)
5. SME’s and Social Cohesion
6. Compatibility with CHP
7. Proximity Principle
8. Public Perception

Advanced Thermal Conversion and ROC’s

Definition:

“Advanced conversion technologies” means, gasification, pyrolysis or anaerobic digestion or any combination thereof

“Pyrolysis” means, the thermal degradation of a substance in the absence of any oxidising agent (other than that which forms part of the substance itself) to produce a char and one or both of gas or liquid

“Gasification” means the substoiciometric oxidation or steam reformation of a substance to produce a gaseous mixture containing two or all of the following: oxides of carbon, methane and hydrogen
Principal Technical Features

- Essentially a fuel gas production plant coupled with a gas fired boiler
- Combined pyrolysis, gasification and high temperature oxidation
- Continuous process
- Each stage separately controlled
- Minimises production of pollutants
- Immediate combustion of gases avoids production of noxious by-products
COMPACT POWER’S COMBINED PROCESS

A revolutionary technology for processing a wide range of waste that remains after recycling and composting to create heat and power.

1. Pyrolysis
   Waste is heated in the absence of oxygen to about 800°C. Hydrocarbons are converted to simple gases leaving a residue of carbon char, inert materials and heavy metals (largely retained in non-leachable form in the ash).

2. Gasification
   Carbon residues are totally reacted out with air and steam in the classic "water gas" reaction to produce hydrogen and carbon monoxide.

3. High temperature oxidation
   Gases are reacted at high temperature (1,250°C, for more than 2 seconds) to ensure the destruction of any organic pollutants and particulates.

4. Energy Recovery
   Exhaust gases pass through a steam boiler which captures up to 80% of available energy. Steam is available for power generation and/or combined heat and power (CHP) applications.
Finham Trials Plant
The Avonmouth Plant

- First operational plant in the UK to receive IPPC certificate
- Tested on RDF, unsorted MSW, sewage sludge
- Commercial facility currently processing clinical, pharmaceutical & confidential waste
### Environmental Impact

<table>
<thead>
<tr>
<th>mg/Nm³</th>
<th>EU Directive Limits</th>
<th>Compact Power</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>s: spot / d: daily</td>
<td>½ hour</td>
</tr>
<tr>
<td>Particulates</td>
<td>10 (d)</td>
<td>30</td>
</tr>
<tr>
<td>VOC’s as carbon</td>
<td>10 (d)</td>
<td>20</td>
</tr>
<tr>
<td>NO (NO + NO₂)</td>
<td>200 (d)</td>
<td>400</td>
</tr>
<tr>
<td>HCl</td>
<td>10 (d)</td>
<td>60</td>
</tr>
<tr>
<td>HF</td>
<td>1 (d)</td>
<td>4</td>
</tr>
<tr>
<td>SO₂</td>
<td>50 (d)</td>
<td>200</td>
</tr>
<tr>
<td>CO</td>
<td>50 (d)</td>
<td>150</td>
</tr>
<tr>
<td>Cd &amp; Tl</td>
<td>0.05 (s)</td>
<td></td>
</tr>
<tr>
<td>Mercury</td>
<td>0.05 (s)</td>
<td></td>
</tr>
<tr>
<td>Pb Cr Cu Mn Ni As Sb Co V Sn</td>
<td>0.5 (s)</td>
<td></td>
</tr>
<tr>
<td>Dioxins TEQ ng/Nm³</td>
<td>0.1 (s)</td>
<td></td>
</tr>
<tr>
<td>N₂O</td>
<td>30 (d)</td>
<td></td>
</tr>
<tr>
<td>NH₃</td>
<td>10 (d)</td>
<td>20</td>
</tr>
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</table>
Key Benefits

Process
- Proprietary technology
- Configuration based on modularity
- Waste processing versatility

Image
- ‘Best Practicable Environmental Option’ (BPEO)
- Environmentally friendly
- Low stack / low profile building

Economics
- Competitive gate fee
- Size / proximity reduces waste transportation impact
- Renewable energy benefits

Energy & gas clean-up
- Energy recovery: heat and/or electricity
- Low emissions

Technology
- Research & development in recovery of valuable by-products
## Funding Structure EfW

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Capital equipment- million</td>
<td>6.3</td>
</tr>
<tr>
<td>Total project development costs- million</td>
<td>8.4</td>
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<tr>
<td>Design configuration</td>
<td>MT8</td>
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<tr>
<td>Annual throughput capacity- tpa</td>
<td>30,000</td>
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<tr>
<td>Gross electrical output- MWe</td>
<td>2.4</td>
</tr>
<tr>
<td>Heat output- MWh</td>
<td>10</td>
</tr>
<tr>
<td>Gate fee required- £/tonne</td>
<td>40</td>
</tr>
</tbody>
</table>
Food Industry Regional Solution

- **Food Waste**
  - On-site Recycling Plant
  - Classification and Segregation Plant
    - Solid Waste
      - Recovered Materials for Reprocessing (e.g. Plastics)
    - Sludge
      - Anaerobic Digestion Plant
        - Gas
        - Industrial / Domestic
      - Compost for Agriculture (Liquid)
    - Gas
      - Pyrolysis / Gasification Plant
        - CHP + Heat
        - Industrial / Domestic

Circa £35m for 120,000 tpa turnkey facility
Integrated Facility for Cornwall
Neath and Port Talbot
Experience and capability 1

- 10 years of operational experience
  - Finham pilot plant
  - Waste handling trials
  - Avonmouth commercial plant

- 10 years of development experience
  - Planning achieved
    - Avonmouth x 3
    - Dumfries x 2
  - Planning in progress
    - Wrexham
    - Bristol
Experience and capability 2

- **IPPC experience**
  - Achieved at Bristol
  - Currently in progress at Wrexham and Dumfries

- **BPEO experience**
  - Achieved BPEO at Dumfries and North Wales

- **Public affairs**
  - Over 3,000 visitors to Avonmouth
  - Ministerial and government official plant visits
  - Strong public support for planning

- **Engineering partnerships for:**
  - Integrated solutions
  - Turnkey procurement
If you have any question, do not hesitate to contact us:

Compact Power
Hydro House, St. Andrews Road, Avonmouth, Bristol
BS11 9HZ, England
Tel: 44 (0) 117 9802900
Fax: 44 (0) 117 9802901
email: info@compactpower.co.uk

or visit our website at:

www.compactpower.co.uk