



**Financial Modelling and Costs of AD  
Plants  
3<sup>rd</sup> October 2012**



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**Outline of Presentation**



1. Introduction – Company background
2. Capital Costs
3. Operating Costs
4. Supplier Warranties and Guarantees
5. Financial Modelling of Projects

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## 1. INTRODUCTION - Company Overview



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### Company Overview



- Stream BioEnergy (Stream) was established to develop agricultural and industrial scale Anaerobic Digestion (AD) infrastructure in Ireland
- The management team has over 20 years experience of developing, financing, building and operating renewable energy projects throughout Europe
- The Stream team is very experienced in the development of renewable energy and waste projects in Ireland
- Extensively researching and developing projects and technology in the AD sector for 3 years
- Currently in the process of developing industrial scale AD projects in Dublin and Cork
- Developing agricultural AD plants in Northern Ireland

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## 2. CAPITAL COSTS



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### Design



#### Type of Plant

- Mesophilic/Thermophilic
- Wet/Dry AD
- Plant size (kW)
- Feedstock Maize/Grass  
Silage/Slurry/Food Waste/etc.

#### Contract Structure

- EPC v Individual contracts v DIY

#### Supplier Considerations

- Experience
- Guarantees/ Warranties
- Credit Worthiness
- O&M Structure

#### Design Considerations

- Pasteurisation (PAS110)
- Odour Control
- Storage of Feedstocks
- Pre-treatment of  
Feedstock
- Separation of Digestate
- Storage of Digestate  
Slurry/Solid/Liquid

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## Capital Costs



  

|  |  |
|--|--|
| <p>AD Plant      <b>£1,500,000</b></p> <ul style="list-style-type: none"> <li>• Hopper/feeding unit</li> <li>• Feeding/Mixing module</li> <li>• Primary Digester</li> <li>• Secondary Digester</li> <li>• Start/Backup boiler</li> <li>• Pumps and Pipes</li> <li>• Cables</li> <li>• Biogas Scrubber</li> <li>• SCADA</li> </ul> <p>CHP Engine    <b>£300,000</b></p> <p>Options</p> <ul style="list-style-type: none"> <li>• Decontamination</li> <li>• Digestate Separation</li> <li>• Belt Dryer</li> <li>• Condenser</li> </ul> | <p>Buildings and Infrastructure    <b>£500,000</b></p> <ul style="list-style-type: none"> <li>• Fencing</li> <li>• Gates</li> <li>• Road Works</li> <li>• Tank Farm Civils</li> <li>• Bunds</li> <li>• Reception Building</li> <li>• Digestate Storage Shed</li> <li>• Digestate Storage Lagoon</li> <li>• Clamp</li> <li>• Grid Connection</li> <li>• Third Party connection</li> </ul> <p>Other Costs</p> <ul style="list-style-type: none"> <li>• Land</li> <li>• Development Costs    <b>£100,000</b></li> <li>• Professional Fees    <b>£100,000</b></li> </ul> |
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Note all costs are for example purposes only and do not represent a particular project of supplier

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## 3. OPERATION & MAINTENANCE COSTS



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## Operating Costs



- Utilities, Chemicals & Disposal
  - Water
  - Biofilter Media
  - Polyelectrolyte
  - Antifoam
  - Ferric Dosing
  - Caustic Soda
  - Liquid Digestate Disposal
  - Solid Digestate disposal
  - Electricity for building & plant
- Labour
  - Plant operators
  - Administration
- CHP Maintenance
  - Spare Parts
- Administration
  - IT Maintenance
  - Site Lease
  - Site Rates
  - Insurance
  - Bonds
  - Office and Telephone
- Transport
  - Front End Loader Lease
  - Fuel
- Monitoring and Consultancy
  - Digestate monitoring
  - ABPR monitoring
  - Professional Fees
  - EA Fees
  - Spreading Licences

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## Feedstock Contracts and Costs



- Third party contracts
  - Length
  - For amount of land or feedstock?
  - Creditworthiness
  - Specification/quality
  - Testing procedures
  - Index linking of the price?
- How do you model what happens at the end of the contract?
- Own Land
  - Know your costs
  - How much head room have you got?
  - What happens if the crop fails?
    - Reserves? Feedstock or cash?

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## 4. SUPPLIER WARRANTIES AND GUARANTEES



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### Supplier Warranties And Guarantees



- Warranties
  - What is Covered
  - How long is it covered for
  - Who pays for lost revenue during down time (Liquidated Damages)
  - What do you need to do to not invalidate the warranties
- Process Guarantees
  - AD supplier is selling a plant not tanks/pumps/engine
  - The pumps may all work but the process may not!
  - How is it tested? How does compensation work?
- Process Support
  - Remote monitoring
  - Local Presence

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## 4. Revenue



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### Revenue



- Electricity
  - Self usage
  - Third party sales
  - Remainder to supply company
  - Fixed or floating price
- RoC and LEC sales
  - Fixed price or auction
  - Agent fees
  - Projections of future RoC prices
- Other Revenue
  - Gate Fees
  - Heat
  - Digestate

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## 4. Modelling



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### Financial Models



#### Assumptions

- Future Electricity/RoC prices
- Feedstock prices
- Operating costs
- Plant Life
- Capital Allowances

You can download a basic model for free from

[http://www.theandersonscentre.co.uk/Free\\_Downloads.asp](http://www.theandersonscentre.co.uk/Free_Downloads.asp)

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B I O E N E R G Y

**THANK YOU**



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