Development of Anaerobic Digestion Plants

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Croke Park, 13th of February 2019

irbea | irish bioenergy association

Development of AD Plants – ROI Context

BioCore Environmental Ltd	• Sludge & Biosolids Services • AD Plant Development Services
AD Plant Development Experience	• Project Experience (UK & ROI)
AD Plant Development	• Internal Challenges (site, design, funding etc.)
AD Plant Development	• External Challenges (grid access, planning permission, permitting, tariff)

BioCore Environmental Ltd

Company Background

- Founded 2010
- Extensive Experience & Capabilities in Waste, Energy, Renewables & Finance Business Sectors
- ISO9001, ISO14001, OHSAS18001
- *Management Team:*

Declan Murray,
Operations Director

Evan Dolan,
Finance Director

James Russell,
Technical Director

Services

- Sludge & Biosolids Management
- Industrial Sludge/Waste Management
- Anaerobic Digestion Plant Development
- R&D

ISO 9001 CERTIFICATION EUROPE™

ISO 14001 CERTIFICATION EUROPE™

OHSAS 18001 CERTIFICATION EUROPE™

Sludge & Biosolids Management

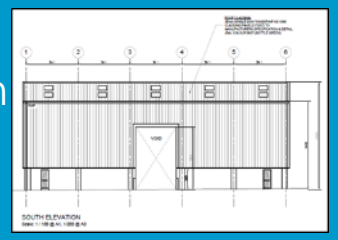
Services

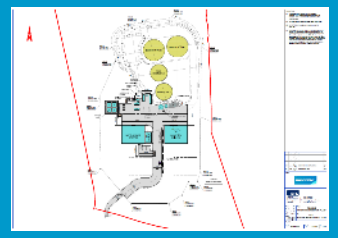
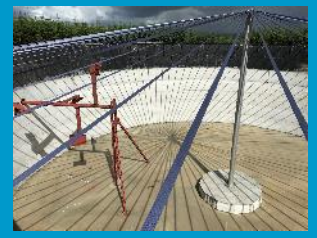
- Irish Water/Private Contracts
  - 100kt+ Annually
- Collection (Nationwide)
  - Haulage Fleet
  - Sub-Contracted Services
- Storage & Treatment
  - 5 No. Biosolid Facilities
  - Alkaline Stabilisation
- Landbank Development
  - 6,000+ acres (Primarily Tillage)
- NMP & Landspreading
- Testing & Reporting

Anaerobic Digestion Plant Development

Services

- Site Appraisal
- Planning Permission Submission
- Grid Connection
- Licencing & Permitting
- Technology Selection
- Design & Contract Coordination
  - Civils/Technology etc..
- Business Model Development
- Funding Arrangements
  - Facility Arrangement
  - Due Diligence Coordination
- Construction Management
- Operations & Maintenance
- Feedstock Supply/Contracts





Anaerobic Digestion Plant Development

UK

- Suffolk, UK
- 100kt Energy Crop AD Plant
  - Maize, Sugar Beet, Pulp, Rye
- Commissioned Dec 2014
- RHI
  - 1,200m^3/hr Biomethane Injection
- FITs
  - 0.5 MWe

ROI

- Co. Roscommon
- 20kt Waste AD Plant
  - WWTP Sludge, FOG's, Food Waste
- Commissioned Oct 2017
- REFIT3
  - 1 MWe HECHP

Anaerobic Digestion Plant Development

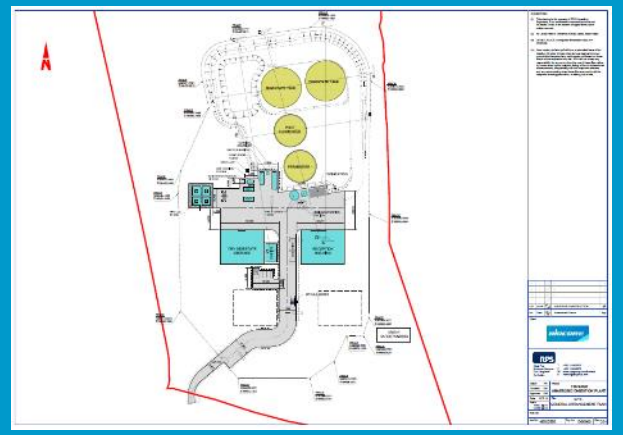
UK

- Funding
- Site & Planning
- Feedstock/Digestate Contracts
- Technology Selection
- Tariff Approval (RHI & FITs)
  - Ofgem
  - PPA
- Grid Connection Agreements
  - National Grid (Gas)
  - UKPN (Elec)
- Grid Connection Works
- Operations
- Routine Maintenance

Anaerobic Digestion Plant Development

- ROI Context

- Funding
- Feedstock Contracts
- Technology Selection
- Construction Contracts
- Tariff Approval (REFIT3)
  - DCCAE & CRU
  - PPA
- Grid Connection Agreements
  - ESB Networks
- Waste Facility Permit/ABP Permit
- Operations
- Maintenance



Anaerobic Digestion Plant Development

- ROI Context

Required Elements

- Site
- Corporate Structure
- Feedstock
- Design – Technology, Civils, M&E
- Grid Connection (Gas & Elec)
- Planning Permission
- Permit/Licence
- Tariff
- Funder

Anaerobic Digestion Plant Development

- ROI Context

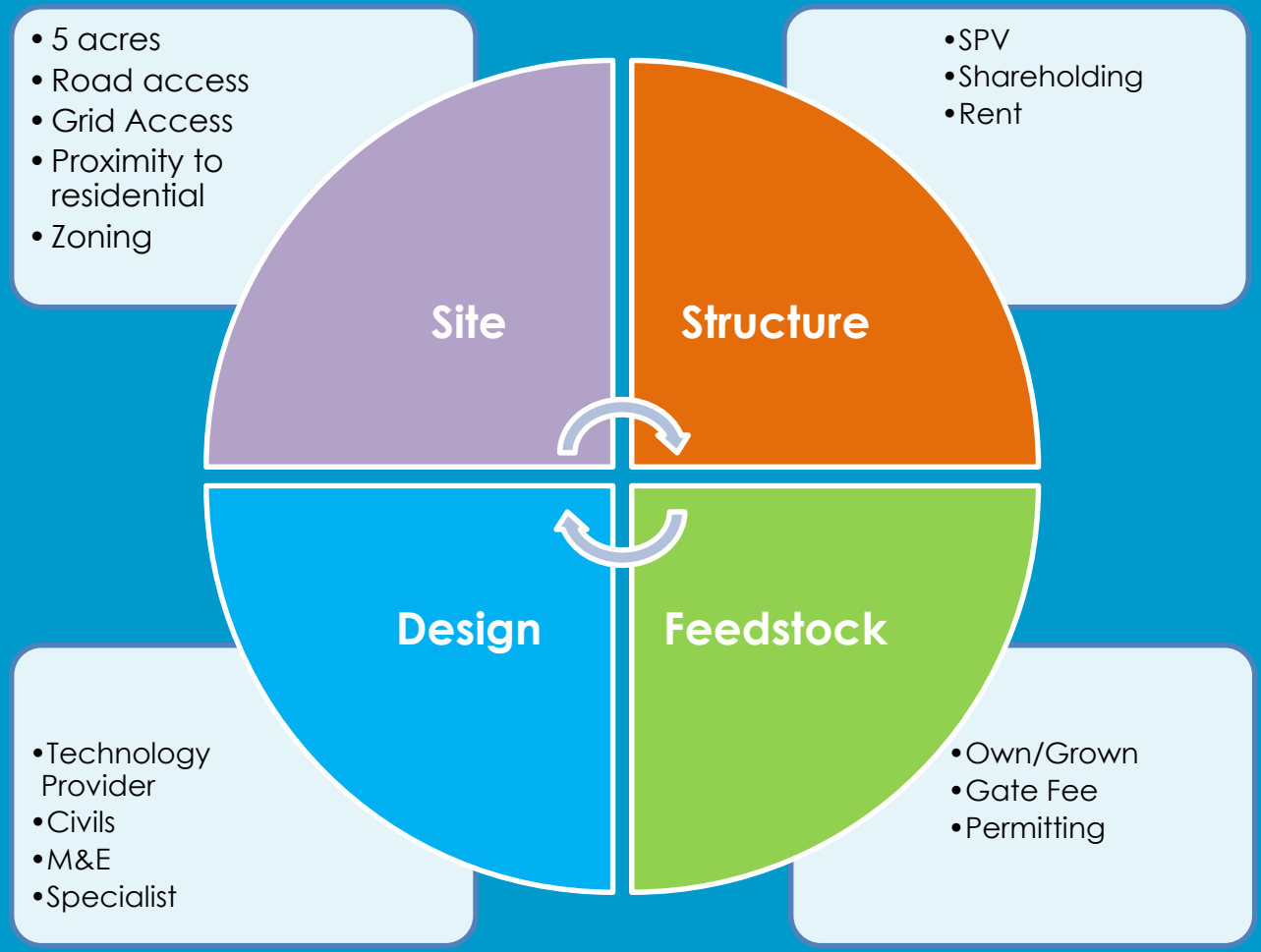
Internal

- Site
- Corporate Structure
- Feedstock
- Design – Technology, Civils, M&E
- Funder

External

- Grid Connection (Gas & Elec)
- Planning Permission
- Permit/Licence
- Tariff

Anaerobic Digestion Plant Development



Anaerobic Digestion Plant Development

- Funder Requirements

Requirements

- SPV
- Site & Planning
- Tariff & Grid Connection
- Permits (WFP/EPA/ABP etc.)
- Civil Engineering
- Technology Provider
- Feedstock Supply
- Fixed Costs/Quotes
- Investment Split (90:10)

- Business Model
- Operational Management

Contracts

- Due Diligence
- Guarantees & Bonds
  - Civil Engineering Co.
  - Technology Provider – Performance
- Step-in Rights
- Finance 10%+ interest Rates

Anaerobic Digestion Plant Development

External – Grid Connection

- Electrical
  - CHP?
  - Demand only?
- Gas
  - Direct Injection
  - Hub
  - CAPEX vs OPEX

Granville Ecopark

Anaerobic Digestion Plant Development

External – Permit/Licence

- Plant Size/Output
  - Feedstock requirement
- Costs vary
- Timelines
- Article 11 Determination

Additional Permitting

- ABPR permit with DAFM
- CN11 Document
- Plant Type 1
- Early engagement with DAFM

Anaerobic Digestion Plant Development

External – Planning Permission

- Pre-Planning Meeting
- General Planning Requirements
  - Location & Land Use
    - Zoning
    - Proximity to sensitive locations (residential)
    - Feedstock sources
    - Digestate landbank
  - Landscape & Visual Impact
  - Site Conditions/Operational Aspects
    - Noise/Light/Odour
    - Containment
    - Groundwater/Surface Water
  - Infrastructure
    - Traffic & Transport Network
- Additional Planning Requirements
  - Environmental Impact Assessment
  - Appropriate Assessment
    - Natura 2000 Site
    - Screening
- Third Party Objections
  - Site History
  - Feedstock/Emissions
  - Visual Amenity
  - Noise
  - Odour

Irbea: Planning Guidance Recommendations for Bioenergy Projects in Ireland

Anaerobic Digestion Plant Development

External – Planning Permission

- Total L.A. AD Applications = 68
- 47 Granted (~70% Success Rate)
  - 2 Third Party Appeal – 1 successful/1 unsuccessful
  - 2 Applicant Appeals – 1 successful/1 withdrawn
- 13 Refused
  - 4 Appealed – 2 successful/2 unsuccessful
- 4 Withdrawn
- 2 Incomplete
- 2 Further Information (Current)

Live Projects = 14 (~30% Success Rate)

- Recommendations
  - National Planning Framework – specify AD
  - County Development Plans – clear policies
- National Planning Framework – Ireland 2040

National Policy Objective 55

Support the circular and bio economy through greater efficiency in renewable resources and land management and by reducing the rate of land use change from urban sprawl and new development.

National Policy Objective 56

Reduce our carbon footprint by integrating climate action into the planning system in support of national targets for climate policy mitigation and adaptation objectives as well as targets for greenhouse gas emissions reductions.

National Policy Objective 57

Promote renewable energy generation at appropriate locations within the built and natural environment to meet objectives towards a low carbon economy by 2050.

Anaerobic Digestion Plant Development

External – Tariff

- UK
  - FITs
  - Commenced April 2011 – New banding Sept 2011 & increased rate – First degression April 2014
  - 0-500 kW = 14.75 p/kWh || 500-5000 kW = 11.51 p/kWh
  - Generation kWh + Export kWh
  - Approx 500 AD CHP Plants (source ADBA)
  - RHI
  - Commenced Jan 2013 – Banding 2015 – First degression July 2015 with rolling degressions
  - Tier 1 0-40000 MWh 8.22 p/kWh || Tier 2 40000-80000 MWh 4.82 p/kWh || Tier 3 80000+ kWh 3.73 p/kWh
  - Approx 100 AD Biomethane Plants (source ADBA)
- NI
  - ROCs (£44/MWh) – No heat payments
  - 0-500 kW = 4 ROCs || 500-5000 kW = 3 ROCs
  - Generation kWh + Export kWh
  - 90% of AD Plants in N.I. ≤ 500 kW = 17.6 p/kWh
  - Approx 90 plants
  - RHI?
- ROI
  - REFIT3
  - Commenced 2010
  - 0-500 kW = 15 c/kWh || 500 kWh+ = 13 c/kWh
  - Index linked (15.76 c/kWh & 13.65 c/kWh)
  - Export kWh only
  - HECHP
  - 14 AD Plants
  - RHI?

Thank You

QUESTIONS?

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