



Energy System Design, Engineering, Manufacture & Installation

Biomass – Combined Heat & Power (CHP) – Refuse Derived Fuel (RDF) – Fossil Fuels



IrBEA Conference 2013 Developing Biomass Energy Projects In Ireland

Alan Fox, Managing Director 21st February 2013



HDS Energy - Introduction

HDS Energy is recognised as a leading European designer and manufacturer of industrial boiler plant and ancillary equipment, and excels in the customisation and engineering of turnkey energy projects to international standards.

HDS Energy has over thirty years experience in the design, manufacture and installation of bespoke boiler solutions for large energy and power projects for clients in Ireland, Europe and North Africa.





Who We Are

A team of dedicated and highly experienced managers, engineers, technicians and craftspeople maintain HDS's position as a market leader in the energy field.

Managers

Project - Quality Control - Production - Technical – Construction – Health & Safety – Environmental – Commissioning – Marketing

Engineers & Technicians

Combustion – Mechanical – Electrical – Structural – Software – Controls & Instrumentation – Production

Craftspeople

Fabricators – Welders – Fitters – Electricians – Plant Operators



Fields of Activity

HDS Energy provide customised turnkey energy solutions to a range of clients across many fields of activity. These clients are united in their need for excellence in energy production plant design.

- Biomass CHP Plants
- Food Processing Plants
- Pharmaceutical Plants
- Hospitals
- Agricultural and Feed Plants
- Manufacturing Plants
- Breweries
- Public Utilities
- Electric Power Generating Plants





Range of Services

HDS Energy can offer a range of services to clients in addition to our engineering and manufacturing capabilities. These services are designed to ensure that the client experiences excellence at every point of contact with HDS Energy throughout the duration of the entire project – from project outline to plant commissioning.

- Feasibility Study
- Basic Design
- Detailed Design
- Planning
- Manufacturing
- Project Management
- Construction
- After-Installation Services
- Test Run
- Maintenance
- Inspection
- Research & Development





Current Projects at HDS Energy





Boyd Bedding - Fuel Intake – Crane Handling



Woodchip delivery truck



External view of fuel intake doors



Delivery of fuel to intake silo by truck



Cladded biomass boiler



Woodchip fuel store



Computer controlled crane with grab for fuel handling



Boyd Bedding Fuel Feeding & Combustion Plant

Step Grate Fuel Feeder & Buffer Hopper







Close up view of Fire Bars



Biotricity :Straw – The Farmer







Biotricity Straw – Unloading & Intake





Straw Plant Biomass Boiler



Straw, cotton stalks, maize, wood, rice husk, energy crops, grass, empty fruit bunches, bark, pellets



Straw Feeding Line





Straw Boiler Feeding System





Vibration Gate





Straw Fired Boiler Plant – Side Elevation













































External view – modern biomass energy plant





Modularised fuel storage utilising pre-fab concrete panels

Rear view of above plant, showing fuel delivery point



















Biomass Boilers for Irish Industry

What are the key drivers and challenges for the development of a sustainable Biomass industry in Ireland?



Challenges Facing The Further Development of a Biomass Industry

•Planning

Grid Connection

•Fuel cost

 Insufficient policy lobby response by the market stakeholders

•Lack of adequate agricultural biomass support mechanism for the sustainable development of an alternative to conventional biomass

Political Uncertainty

Power Purchase Agreement

•Grid Code Compliance

•HECHP Qualification

•Wind Lobby

Project Funding



Political Uncertainty?

"..the sale of Bord Gais Energy is expected to be followed by sales of some ESB power stations, much of the state forestry agency Coillte and the government shareholding in AerLingus.."

Irish Independent Business Friday 15th February 2013



Overview of the Energy Landscape

Industrial Fuel Costs per KW/hour

Fuel	Cost per KW/hour
Natural Gas	3.2c – 3.5c
Heavy Fuel Oil	6.0c – 7.0c
Coal	1.85c – 2.2c
Pulp Wood & Sawmill Residue	??? Current floor price for pulp going to boardmills suggests a price of 2.0c – 2.2c ???
Straw	2.0c – 2.2c
Willow	2.0c – 2.2c



Conclusion!

For a project to be "Bankable" it MUST have a sustainable Fuel supply – ie :

 Price must be competitive when compared with other fuel options

• Price of fuel must reflect the challenges and risk of capital expenditure required to convert to biomass, therefore price differential must be favourable if investment is to happen



The lack of a comprehensive developed agricultural biomass support mechanism to promote the growing of energy crops as an alternative farm income and important substitution for fossil fuel, is one of the country's energy policy failures.



How have HDS Energy faced this challenge in relation to their current projects?

Every project has required the development of a tailor-made solution involving substitution of alternative fuel or the strategic development of a new fuel source, such as willow, poplar, straw or other suitable combustible feedstock.



Project	Biomass Fuel Supply Solution
Biotricity €50m	Following negotiations with banks, recurring questions about availability of fuel over the 15 year term of the funding; Solution : Straw to be primary fuel
Shamrock Renewable Fuels €55m	Economic model built around strict compliance with REFIT and embraces the benefit of all heat being utilised for the production of high value biomass products – ie briquettes, pellets etc. Fuel supply is a diverse mix of willow, miscanthus, straw and wood biomass.
Connacht Gold Phase 1, 2,3 €10m	Solution : Farmers Co-Op owns significant holding in ECC Sawmill, allows securing biomass fuel supply in short term; longer term Co-Op engaging with willow & poplar growing programme with farmer members, supplementing farm income and benefitting shareholder milk price for resulting product
Powerchron €55m	Locally sourced biomass fuel presents the only viable proposition, forestry residue from Donegal presents the best economic proposition.
Boyd Bedding €7.5m	Manufacturing sterilised animal bedding, required carbon neutral product, using non fossil fuel; secondary requirement to utilise by-product of his core business as a supplementary fuel; Solution : source timber



Considering the foregoing demands to provide feedstock, and looking at geographic spread of potential projects, it is clear that locally grown agri-biomass presents the most significant opportunity for the continued expansion of a biomass supply chain, based on clusters located across reasonable transport distance from the **Energy Consumer**



Common Links Between Projects

- Commercial Scale
- Developed individual fuel strategies out of necessity
- REFIT Support (Biotricity, Powerchron, SRF)
- Existing fuel costs too high Connacht Gold, rising HFO costs

•Carbon neutral fuel goal – Boyd Bedding; also NI Reusable Heat Incentive benefits

•None of these installations is replacing an existing gas fuelled system









Poplar

Plantation growth at the end of the first cycle (2 years).

Trees are ready to be harvested



Poplar

Harvesting systems for 2-year rotation plantations

Cut off and chipping in 2 different phases









3-year old plantation



5-year old plantation (ready to be harvested)





Willow woodchip supplies Carbon neutral heat

Biomass Boiler





Food Plant

The Willow Cycle

Food Plant's Sludge removed





Spreading Sludge



Sludge is bioremediated on willow

Growing Willow

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Willow Woodchip

Willow is harvested, chipped & dried



And Finally....How NOT to Proceed!





Thank You