



APSE 20th June 2011

Investing in Biomass



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About Rural Generation

- Established in 1996
- Installed over of 150 biomass boilers equating to 12MW's heating capacity
- 7MW of this capacity in N.I. -estimated annual carbon saving 6,000 t
- Example Customers: National Trust, Omagh College, Omagh LC, Ballyclare LC, Dobbies Garden Centres, Government Estate



Environmental Products Offered

- Willow Planting & Harvesting
- Willow Chip & Heat Provision Contracts
- Boiler Sale and Fuel Supply Contracts
- Energy Services Contracts (ESCO)
- Design & Installation of Biofiltration & Energy Generation Projects
- Holistic Waste & Energy Solutions



Biomass Heat?

- Automated or non automated systems
- Highly sophisticated technology
- Can run on wood chip, wood pellets, straw, grain
- Capital expenditure is higher than oil & gas boilers
- Widely used throughout Europe
- Increasing in popularity throughout Ireland & U.K.

Cost Effective Applications for Biomass Heat

Steady Heat Demand:

- Hotels – especially with swimming pool.
- Nursing Homes.
- Leisure Centres.
- Industry – large heat & steam users.
- Hospitals.
- Housing Developments – district heating



Boiler Portfolio

10kW – 7MW: Heat, Steam, Hot Water

- Farm 2000: 25kw – 300kW Waste Wood
- KWB: 10kW- 300kW Chip & Pellets
- BioKompakt: 25kW – 250kW Multi fuel
- Herz: 300kW – 1MW Chip & Pellets
- Justsen: 1MW – 7MW Chip, Pellets, Sawdust

Non Automated Systems



- Burn wood & straw.
- Applications:
 - Farms
 - Kitchen manufacturers
 - Hardware stores
- Manual ignition, loading & ash removal.
- Not suitable in urban domestic residences.

KWB - Automated Systems

KWB Multifire - Wood chip fired heating system and pellet heating system with an output range up to 100 KW



KWB Powerfire
130kW – 300kW
Large Scale solution



KWB Automated Systems

- Manufactured in Austria
- Automatic feeding system, ignition, self cleaning, ash extraction, remote monitoring available
- Boiler range 10kW – 300kW



Herz Automated System

300kW to 1000kW. Runs on Chip & Pellets. Commercial boiler

- Commercial boiler
- Manufactured In Austria
- Automatic feed, ignition, ash extraction

- Example Installations:

Omagh Leisure Centre – 500kW

PRONI, Titanic Qtr – 500kW

Omagh College – 250kW


Fane Valley – 220kW

Castle Espie – 180kW



Containerised – “Plug & Play” Solution 20kW – 1MW





Containerised – “Plug & Play” Solution 20kW – 1MW

- Reduced construction works & time spent on site
- Easier to finance
- Contains boiler house, boiler, fuel store, feed system, buffer tank & flue
- Designed & rendered to customer specifications
- Popular in Schools Installations

Risk Management

- Biomass boiler with oil/gas back up
- Biomass for base load, oil for peak
- Biomass boilers typically downturn to 30%

Example Fuel Stores - Commercial



Purpose Built Chip Store
Medium – Large Jobs



Purpose Built Chip Store - Large Jobs

Underground Chip Store
Medium – Large Jobs



Hook Skip Chip Store - Large Jobs

Other Information

MUST be installed with a water storage tank

- Chip systems tend to be approx. £5/6 thousand more expensive than pellet systems
- Chip requires 2-3 times more storage capacity than pellet
- A chip system can be re calibrated to burn pellet
- Pellet system cannot burn chip



Factors To Consider

- Transport costs expensive over 40 miles
- Method of Delivery
- Access to Fuel Store
- Storage Capacity
- Heat Profile

Early Involvement at Design Stage can Overcome These

Fuel Supply

Guaranteed Fuel Supply Is Now The Perceived The Biggest Risk When Installing Biomass Systems!

- Quality of Fuel
- Availability of Fuel
- Reliability of Supply Chain
- Local Sources
- Price Volatility (Future)

Fuel Supply

- The technology is proven, fuel supply is now biggest consideration
- Where possible wood chip suited to larger installations.
- Security of supply & quality standards are paramount if the sector is to develop.
- Rural Generation offer both to customers.



Wood Fuel Heating Solutions

- Straight Purchase
- Heat Contract
- Energy Services Contract (ESCO)



Straight Purchase

- Customer buys boiler, feed system & associated equipment
- Customer has no long term price wood fuel security
- Wood chip quality becomes customers responsibility to monitor
- Operation, maintenance & spare parts are an additional cost to customer
- Ash removal is customers responsibility

Heat Contract

- Contract period generally 5 –10 yrs
- Client buys boiler, feed system and associated equipment.
- RGL operate & maintain biomass boiler system
- RGL manage & supply fuel requirements
- Client pays for heat consumed per Kwh

Energy Services Contract

- Contract period generally 10 –20 yrs
- RGL buy boiler & feed system
- RGL incur additional building costs, inc boiler house & fuel store
- RGL operate & maintain biomass boiler system
- RGL manage & supply fuel requirements
- Client pay for heat consumed per Kwh

Heating Costs Compared

- Oil – average price N.I. 0.58p per litre
 - Wood Pellets - £165 per tonne delivered.
 - Wood Chip - £110 per tonne delivered (<18% moisture content)
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- Oil 1000lts = £580 & 10,600kWh's
 - Equiv pellets = £344 (delivered heat)
 - Equiv Chip = £275 (delivered heat)

Omagh Leisure Centre



500KW

Omagh Leisure Centre Payback

500kW Biomass Boiler – wood chip

Project Costs - £100,000

Running hours – 1,500,000 kWh p/a minimum

Annual Wood Fuel Cost - £ 45,830

Equivalent cost oil - £ 94,386 (assuming £0.58 per litre)

Annual Saving - £48,556

Payback Period oil – 2 yrs



Omagh Leisure Centre (Equipment)

- 500KW Boiler
- Heat Contract
- Specified to do 70% of load (1.3m Kwh)
- 2008-2010 3.1m Kwh
- Un-usually no buffer tank (we use the pool)



Omagh Leisure Centre (Equipment)

- Working along with two oil boilers
- Footprint of machine was a factor in decision making
- Automatic Ash Removal
- Remote monitoring on the system
- Bespoke designed Fuel store (*limiting factors were money and space*)
- Fuel store will hold 14 tonnes (2 deliveries per week)

Case Study



Omagh College, Co. Tyrone, Northern Ireland



Omagh College Payback

150kW Biomass Boiler – wood chip

Project Costs - £32,000

Running hours – 3115 full load hrs (Nov 05 – Nov 06).

Wood Fuel p/a – 78.44 t

Total Wood Fuel Cost - £ 7060

Equivalent cost gas - £13,036 (assuming 2.79p kWh)

Equivalent cost oil - £ 16,961 (assuming 3.63. kWh)

Payback Period oil – 3.2 yrs (assuming no grant funding)

Payback Period gas – 5.3 yrs

(analysis carried out by Action Renewables, 2007)



Case Study



Belle Isle Castle, Enniskillen, Fermanagh

<http://www.belleislecastle.com/>



Belle Isle Castle Payback

100kW Biomass Boiler – wood pellet

Project Costs - £30,000

Running hours – 2700 full load hrs (Mar 06 – Mar 07).

Wood Fuel p/a – 25.86 t

Total Wood Fuel Cost - £ 2735.52

Historical oil costs Mar 05 – Mar 06 - £8,900

Payback Period – 4.8 yrs

(analysis carried out by Action Renewables, 2007)



Customer Comments

These figures are based on wood chip.

CSD (previously oil-fired)

Cost of installation £31,000
Annual savings £6,700
Payback 4.6 years
CO2 savings 71 tonne

Sixmile (previously oil-fired)

Cost of installation £130,000
Annual savings £65,700
Payback 2 years
CO2 savings 650 tonne

Valley (previously gas-fired)

Cost of installation £143,000
Annual savings £28,700
Payback 5 years
CO2 savings 326 tonne

Willie J Dunbar

**Newtownabbey Borough
Council**

**Property Services Manager
028 90340143**



RHI – U.K.

500kW = 4.6p per kWh for 1314 Full Load Hours =
£30,222 p/a (657,000kWh)

- Remaining 843,000 kWh = 1.9p per kWh = £16,017 p/a
- Total Revenue p/a = £46,239
- Total Revenue 20 yrs = £924,780
- NB: Under ESCO Rural Generation Claim the RHI

Carbon Saving

- Becoming Increasing Important as CRC Impacts Councils
- Saving = 400 Tonnes p/a
- Assuming £12 per tonne = £4,800 p/a



Thank You Questions

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