

Renewable Heat Technologies/Fuels

Solar Thermal

3 types of collectors convert solar radiation into a heated liquid.

- Flat plate
- Evacuated tubes
- Solar Concentrators

Passive solar designs in buildings are made in a way to maximise or minimise solar heating

Heat Pumps

Think a fridge in reverse but the main heating/cooling circuit might run through a “Ground source” or “Water source”

Deep Geothermal

Pumping water deep underground into hot rocks to come up again as steam. Think Geyser not Gezeer.

Biogas

- Anaerobic Digestion – Bio methane - Think lighting farts.
- Synthetic Gas “Syngas” – Think old style coal derived “town gas” but from wood.

Bio liquids

Bioethanol Fermentation of carbohydrate rich feedstock in the presence of oxygen and then separation/distillation – Think potcheen

Biodiesel Transesterification of organic fats. Some simple chemical processing of fats and oils.

Fischer–Tropsch Process turning a Syngas into a liquid that can be used for a fuel amongst other things

Biomass (can technically be a liquid or gas but below is all about solid material)

- Any organic animal or vegetable matter.
- Can be a waste.
- Is a fuel- Can be transported, stored and used at a later date.
- Don't get bogged down in how far it's been transported.

Woody biomass generally comes in 3 formats

1. Logs/briquettes
2. Woodchip
3. Pellets

3 broad source categories

- Virgin – products and residuals from forestry, arboriculture and agriculture plus primary processing (sawmills/agro processors)
- Clean Recycled Wood – untreated pallets and offcuts – Article 2 WID Exempt
- Dirty recycled Wood – Needs to go into a WID compliant burner

OFGEM will require Mandatory Sustainability Reporting on fuels for ROCs/RHI by 2013

FSC and PEFC are the main wood sustainability quality assurance schemes

CEN/TC 335 is the European Standard for testing biomass

Quality Assurance Schemes on fuel Standards from HETAS and ENPlus.

NW England Woody Biomass Fuel Supply Directory available to Download from Envirolink Northwest

Combustion of Biomass and Wastes

Drivers for combustion/thermal recovery are Carrots and Sticks

Sticks

[Landfill Tax](#)

[EU ETS](#)

[Climate Change Levy](#) & [Climate Change Agreements](#)

[Carbon Reduction Commitment/ Energy Efficiency Scheme](#)



Carrots

[Renewable Obligation](#)

[Renewable Heat Incentive](#)

Fuels burn in 3 stages

1. Drying
2. Gaseous stage
3. Char stage

Controlling the air/fuel mix in the gaseous stage can give rise to the processes of gasification or Pyrolysis

[A directory of large scale kit](#) that burn biomass and wastes is available from Envirolink Northwest.

Air quality is the big issue. There is a whole heap of legislation here. Talk to Your EHO at the earliest opportunity otherwise they are going to get very upset. Excellent document of air quality considerations from [Environmental Protection UK](#).

Building Regulations apply of kit below 50kW [Part J](#).

The applicant is most likely to trip up on delivery, storage and reception issues.

An exceptionally good [Biomass Guidance Note for DC Planners](#) is available in the 4NW archive.

Patrons: The Rt. Hon. Lord Thomas of Macclesfield and
His Grace The Duke of Westminster KG CB OBE TD CD DL

An initiative of Cheshire West and Chester Council, Halton Borough Council, Knowsley Metropolitan Borough Council, Liverpool City Council, St. Helens Metropolitan Borough Council, Sefton Metropolitan Borough Council, Warrington Borough Council, Natural England and the Forestry Commission.

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