Green Land Reclamation Ltd

Some observations on 20 years of research and development in the fields of biomass and waste.

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Experiences in the fields of biomass and waste (1).

Since its incorporation in 1984, Green Land has carried out research, and provided project-management, in the fields of energy, environment and construction-materials, under the following headings:

1. Policy and market-intelligence.
2. Research, development, and demonstration of technologies.
3. Commercial implementation of technologies.
4. Dissemination of information, and education for sustainable development.

Experiences in the fields of biomass and waste (2).

In 1984, there were few viable opportunities in the UK to recover energy from biomass or waste. Sewage-gas was the obvious exception, because sewage-works could use the electricity and heat generated in-house.

Green Land looked for ways to exploit landfill gas, and researched (a) total clean-up to methane and then cryogenic liquefaction as a route to transport-fuel, and (b) partial clean-up and use for power-generation.

Alternative vehicle-fuels became unattractive when the oil-price fell. A power station was built with second-hand gen-sets in 1987, and that technology became more generally viable after the privatisation of the electricity-industry in 1989/90. But nothing else in the fields of energy from biomass and waste then seemed possible in the UK without very large grants.

Experiences in the fields of biomass and waste (3).

Under the Energy Act, 1983, CEGB was paid 30 per cent more for its electricity than independent generators, and was charged far less for business-rates. The Association of Independent Electricity Producers was formed in 1988 and later successfully lobbied for a better deal, and part of that turned out to be NFFO. Green Land has always played a strong role in the Association.

The need for strong arguments to produce radical political changes led Green Land to (a) forge links with European partners (including universities, government agencies and businesses), (b) begin research into externalities, and (c) look closely at wood-based systems.

Experiences in the fields of biomass and waste (4).

Pyrolysis and/or gasification, coupled with energy-crops and combined-cycle energy-conversion were popular concepts in the early 1990s, and were given special places in NFFO-3 and in the EC's demonstration programmes.

There was no chance for Green Land to work on the ARBRE (8 MWe) project but, for six years (until the end of 2000), was very active in the project-company that started to develop its larger (12 - 16 MWe) sister in Pisa (the "*Energy Farm")*. The company also participated in the well-known project to gasify fuels recovered from municipal waste at Greve near Florence.

But, despite large investments, no such project has yet survived into the commercial stage.

Experiences in the fields of biomass and waste (5).

Working across this range of experiences then led to other challenges. For example, it became obvious in the mid 1990s that there should be European Standards for fuels made from biomass and wastes. Green Land has been an active partner in each of the research-projects supporting CEN/TC335 and 343, leading work on sampling and on quality-management. One of the company's directors served as the Chairman of the relevant Technical Committee of BSI for four years.

The company has also continued to work on experimental or demonstration plants in several European countries (Italy, Portugal, Spain, Sweden, UK) including (a) power stations based on simple combustion of various types of biomass/wastes, (b) plants producing wood-pellets and, most recently, (c) an advanced anaerobic digester.

Conclusions (1) - little progress in the UK.

What progress can we see today in the UK on renewables? Although Mr Blair says that we are making good progress towards our targets for emissions-reductions, there must be grave doubts about our position. The Renewables Obligation has been a positive step, but it is not enough. It is important that it remains a market-measure, and is not tampered with for political reasons.

In the UK, only two renewable technologies have a strong foothold – electricity from (a) landfill gas, and (b) on-shore wind-power. The very large resources of renewable energy from biomass and waste remain largely untapped. Yet other European countries are streets ahead of the UK in these fields.

There is thus no reason connected with technology that is obstructing similar development here. As was the case 21 years ago, the problems for renewable energy in the UK are institutional.

Conclusions (2) - biomass is still a Cinderella in the UK.

Strategies such as the sequestration of carbon dioxide and the conversion of fossil fuels to hydrogen might address parts of the peril of climate-change, but they will require **increases** in energy-inputs.

Biomass is still the Cinderella of renewables in the UK, and yet there is no need for a high-tech approach to make it viable. It is interesting that, 20 years after Green Land built its first pilot plant, the Swedes have put into commercial operation the fuelling of vehicles with scrubbed biogas. The Swedes are also operating a pilot plant to produce ethanol from wood; the Italians are studying oil-crops, etc.

Conclusions (3) - the need for a radical change in policy.

Until consumers are made to pay the real costs of using fossil fuels (oil, gas, coal, uranium), demand for those fuels will continue to rise. Thus there is a need for new measures, such as a broader carbon-tax on fossil fuels to include those that are used for space-heating in residential premises. Green Land has recently been working in this area of policy.

Such a tax, with its proceeds recycled through, for example, rebates on Council Tax, would encourage, among other technologies, wood-heating, which can reach high levels of conversion efficiency (over 90 per cent). It would do so at least cost, and also encourage energy-saving (which a Heat Obligation would not).