



Energy



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The provision of a secure energy supply has rapidly become one of our foremost concerns. The UK ceased to be capable of meeting its own energy needs from early 2004 and by the end of 2005 the amount of energy imported into the UK, had risen to the highest levels since 1978. The National Grid is currently stretched to its limits and the stability of our future supply from external sources is constantly in question. Added to this, the ever present threat of terrorist activity has placed additional pressure on the government to look at ways to de-centralise the grid, thus reducing our vulnerability to a major interruption of supply, as a result of any singular event.

More than ever, there is a need to ensure that we use our energy wisely, creating it in an environmentally sound manner and using the most efficient means possible. Many see energy from waste as a means of achieving this goal, but existing "energy from waste schemes" usually refer to Incineration. Even ignoring the environmental arguments against incineration, in terms of energy capture these are particularly wasteful, often failing to capture even 25% of the available energy. Generation of energy from waste is undoubtedly the correct solution - But this must be done using the most efficient and environmentally sensitive methods possible.

## Four Separate Opportunities To Produce Renewable Energy



**GAS** The gas stream produced by EPI's process has a substantially higher calorific value than those from almost any other process. Working closely with some of the leading manufacturers of gas engines, we are conservatively able to project a capacity to generate electricity in excess of 1MW/e from every tonne of material processed. On gas alone and based upon average UK domestic electrical consumption data, (Sourced from the DTI's Energy Report 2006), a 5 tonne per hour plant (5 modules), would produce sufficient energy to meet the total electrical requirements of more than 10,200 households over the year. A substantial contribution towards European targets for provision of electricity from renewable sources.

**CHP** The surplus heat created by the gas engines and generators is suitable for use in Local District Heating applications by means of CHP (Combined Heat & Power). With the majority of EPI plants located in towns and cities, there will be ample opportunity to utilise this additional energy.

It is reasonable to expect each plant to produce at least as much thermal energy as that produced in electrical energy. On a conservative estimate this means that we can project a capacity to generate in excess of 1MW/thermal from every tonne of material processed.



**CARBON CHAR** is yet another by-product of EPI's process. This high quality, energy rich, carbon char provides a number of opportunities for the production of additional energy. As a source of heat energy the char has an energy value better than any coal. Better still, any contaminants that might have been present within the original material, are destroyed during the process, leaving a clean, smokeless product.

The char produced represents an equivalent of 15% of the incoming waste stream. As a guide, the annual quantity of carbon char produced from a 5 tonne per hour EPI plant, would produce sufficient energy to replace more than 8000 tonnes of the best quality bituminous coals.

**OIL** As the hot gases are cooled, a distillate oil is left behind. The oil composition will vary dependant upon the material being processed, and this will impact upon the likely commercial opportunities for this product. However, the calorific value is extremely high... Up to 25% higher than the oils produced by similar processes. We have yet to fully explore the commercial potential for this material, but with minimal modification we hope to be able to improve these oils, so that they can be used in standard diesel engines, thus producing sufficient energy for our on site needs

Dependant upon their origin, Bio-Oils are very much the current flavour. The oils produced are likely to require various levels of refining in order to realise their full potential, however, this is little different to the processes already carried out by the Petrochemical industry on natural crude oil.



As part of a Europe wide initiative to reduce carbon emissions and lower our dependency upon fossil fuels, the companies responsible for supplying our electrical energy, are under a mandatory obligation to obtain 20% of their energy from renewable sources by 2020. The EC have yet to assign individual country targets but the countries with the most ambitious targets, which are to be met by 2010 include Spain, Germany, France, Italy, Sweden and the UK. As such it is anticipated that UK targets will require even higher levels of renewable usage.

To further encourage the development of new energy technologies, producers of energy classified as renewable now have the potential to earn substantially more for their energy production via Renewable Obligation Certificates (ROC's). A further incentive has recently been announced allowing a doubling of ROC's payments for energy produced by Pyrolysis technologies until 2027.

**Electricity Generated from EPI's Process is  
Classified as Renewable and now Qualifies for Double ROC's**

EPI's unique technology produces 20 times as much energy as it consumes. This is not just Carbon Neutral, but Carbon Negative by a factor of 20... **Carbon Negative**<sup>20</sup>

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