



Bio-Renewable Energy Research Park

The Government's Renewable Energy Strategy (2009) highlighted the importance of bioenergy in achieving UK renewable energy targets.

Renewables East recognised that the region, and the wider UK, is far behind its European competitors regarding the design, manufacture and deployment of bio-energy technology.

It therefore proposed that a dedicated centre would help reverse this, if the centre provided technical support, test facilities and space for businesses (start ups, small, medium and large, including inward investors). This would help 'kick-start' and support the growth of a dynamic, innovative bioenergy cluster in the East of England.

Renewables East engaged the services of Adroit Economics, The Asset Factor (land development experts) and AEA Technology, who acting in collaboration, assessed the validity of the proposal for a Bio-Renewable Energy Research Park and how regional opportunities could be realised/optimised.

The initial proposed concept was for a 40 acre site. International experience shows successful clusters can reach 8 million sq ft plus in scale. Experience also illustrates that if sufficient land is not initially ring fenced to accommodate potential growth, subsequent large scale growth could be prevented. The project could trigger the growth of a very significant bioenergy cluster, perhaps reaching 3-5 million sq ft and therefore sufficient land should be ring fenced to support circa 4 million sq ft. This translates into a land take of c.125 acres.

Technology

AEA confirmed that bioenergy is one of the most promising renewable energies in the UK, EU and globally. Not only is there a large array of feedstock resources from energy crops, to fuels derived from wastes i.e. waste wood or biogas from anaerobic digestion, but that there is also a wide variety of technologies available to extract the inherent energy. Bioenergy is flexible and can be used to produce heat and/or electricity through a range of thermal processes. It can also be converted to more flexible solid, liquid or gaseous products through both of thermal and biological processes.

AEA are clear that there are significant opportunities for the Bio-Renewable Energy Research Park to influence a range of bioenergy technologies and their development. From an assessment of the possible short, medium and long term trends it is anticipated that the greatest scope for the park exists within the technology development of:

- anaerobic digestion (current and future low cost, high efficiency, small, modular plants)
- advanced thermal technologies (such as gasification and pyrolysis)
- technologies for the Built Environment (Combined Heat & Power, CHP and biomass heat)

The required escalation in bioenergy deployment, particularly in small scale units suitable for installation in the residential and non-residential built environment, will require a significant number of people to undertake activities such as manufacturing, servicing and installation as well as design and surveying capability. These are skills which are currently in short supply need to be expanded massively through training. All parties recommend that a training centre, dedicated to training on bio-energy technologies, should be included.

The Market

Park testing facilities will aid, support and significantly stimulate activity in the 'difficult' prototyping and scale up pilot phase of the bio-energy technology commercialisation process.

It will enable more 'front end' science and technology (accessed globally) to move more rapidly to the translational, proof of concept and proto-typing stages, through to the often cost-prohibitive scale up pilot stage, resulting in an overall acceleration of technology adoption and commercialisation.

In particular, it will help address the barriers and hurdles SMEs will face, thereby helping create a bio-energy cluster and skills base, where none exists.

Universities, medium and large companies (individually, or in collaboration), will often require temporary research and test space (the park will provide both a neutral but also an ideal environment for a collaborative research team to locate to for a specific period, or permanently)

Potential foreign inward investors often set up a small (staging post) function in a new target country first (the park will provide a fully supportive environment and flexible accommodation for this)

Critically, the park (as long as it includes sufficient development space) will help the UK attract major inward investment projects (corporate and/or research organisation).

The park will act as a catalyst and provide a focal point and supporting foundation for a growing bio-energy skills base and supply chain.

Investment Model

There is a need to balance the priorities of maximising private sector investment, minimising public sector subsidies **and** early delivery - recognising that the opportunity and need exists **if** government renewable energy targets are to be met.

A number of procurement options were considered as part of the study. The preferred option involves a three-phase approach with the public sector restricting its activities to early stage buying/securing of land, funding any necessary works to open up initial land for development, funding the key incubator and pilot areas and then marketing the project to attract both the SME s for the incubator but over time also the longer term occupiers. These activities are likely to form the key elements within the first phase, whilst the private sector will deliver to longer term users

To ensure that the park focuses on its objectives and is not diverted by market, shareholder or investor pressure (to pursue alternative objectives), the scheme would draw on best practice from science park management. This will involve creation of a trustee vehicle to ensure the park remains true to its objectives, but also has sufficient flexibility to optimise appropriate opportunities, as they emerge.

A key outcome from early work was the identification of a number of suitable 'location types' across the region. These have been evaluated using a semi-quantitative scoring process and the resulting analysis therefore suggests a location in the Thames Gateway (north) area, favouring existing industrial land, in order to enable speed to market.

Summary

The collaborative work of Renewables East, Adroit Economics, The Asset Factor and AEA Technology **confirmed the validity of the proposal for a Bio-Renewables Energy Research Park.**

They also provided supporting data for subsequent steps of the feasibility study, namely site/partner discussions & selection and finally, preparation of a full Green Book business case.

Analysis identified the best location would be in the Thames Gateway (north) area, favouring existing industrial land, which would maximise speed to market.

Sufficient land should be ring fenced to support expansion to c.4m sq ft (c.125 acres).

Results also concluded:

- A Bio-renewable energy research park would significantly increase the chance and rate of the region establishing and growing a significant, dynamic, innovative cluster and supply chain – where ***none exists at present***
- It will directly address the principal blockages, hurdles and barriers that will frustrate, slow and even prevent the growth of the cluster – thereby directly addressing the chief market obstacles/ market failures

Furthermore, it will lever the region's assets/ competitive advantages i.e:

- a wide range and quantity of bio-energy feed stocks
- rapid evolution of a bioenergy industry supply chain through diversifying Thames Gateway (north) existing supply chain and engineering skills.
- proximity to a very large market (one of the largest conurbations in Europe)

After initial public sector pump priming investment, the park would generate high private sector investment leverage (c.£755m) from 2013, and would return good cost per job and GVA leverage figures (when sufficient critical mass has been achieved in the final phases). When fully developed:

- Phases 1 and 2 are estimated to generate (on and off-site) c.4,000 net additional jobs and £172m net additional GVA, resulting in a cost per job of c.£5,800 and GVA leverage of £7.61 per pound of public sector investment.
- With phase 3 completed(over a 15yr timespan), the scheme as a whole is estimated to generate (on and off-site) c.8,300 net additional jobs and £375m net additional GVA, resulting in a cost per job of c.£2,900 and GVA leverage of £15.63 per pound of public sector investment.

An initial public investment of circa £28M over two years would start the project by investing in :

Land, planning, infrastructure c.£18m / Incubator & pilot facilities c.£7m / Development costs c. £3m

A copy of the Technology Report and Economic Report – Executive Summary are posted on this website.

If you require a full Economic Report, please contact: Richardparker@renewableseast.org.uk

