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UK Bio-Energy Centre, Thames Gateway (north): Stage 1 business case - Exec Sum & Exec Report

Prepared by Adroit Economics and the Asset Factor, with technology advice from AEA Group

For and on behalf of

Renewables East

Author: *Dr Stephen Sheppard & Keith Perry*

steve.sheppard@adroit-economics.co.uk

Keith.Perry@theassetfactor.com

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Registered Office:

Adroit House, 31 Finchley Road, Hale, Altrincham, Cheshire, WA15 9RE

Company registered in England No: 05567197

London office: 7 Leaholme Gardens, Slough, Berkshire, SL1 6LD
Birmingham office: 101 Grange Road, Kings Heath, Birmingham, B14 7RX

www.adroit-economics.co.uk

1. Executive Summary

The vision

1.1 Renewables East has identified the opportunity and need to establish a centre that provides technical support, facilities and space for businesses (start ups, small, medium and large, including inward investors), to help 'kick-start' and support the growth of a dynamic, innovative bio-energy cluster in the region.

1.2 Renewables East recognised that the region (and the wider UK) are far behind its European competitors regarding the design, manufacturer and deployment of bio-energy technology and that a dedicated centre would help reverse this, thus ensuring that the region benefited from what will be a very high growth, high value global industry and at the same time, helping achieve the region's and the UK's ambitious 2020 New and Renewable (N&R) energy targets (and associated energy security objectives).

1.3 Adroit Economics Ltd and The Asset Factor, with technology advice from AEA Group, were commissioned to assess the validity of the above proposition and to prepare a green-book based, stage 1 business case for a scheme.

The proposition – the UK Bio-Energy Centre, supporting growth of an innovative, dynamic bio-energy cluster and supply chain in the East of England/Thames Gateway

1.4 **Based on technology, policy and market research, and drawing on international experience, we confirm that the validity of the above proposition**. Through a Treasury green book options appraisal process, we have identified a preferred option which is:

- The creation of a UK Bio-energy centre in Thames Gateway (north), initially comprising (in phase 1), an incubator, meeting and training facilities, technical yard and technical covered space, technical facilities and technical support, links with FE/HE dedicated training facilities, space for half a dozen small scale demonstrator bio-energy units, with office, workshop and lab space for initial star-ups and established firms
- With the opportunity to grow the centre, possibly very considerably, to c.3-4 million sq ft, if demand is realised (development will be demand-led)
- A location in the Thames Gateway (north) is optimal for three reasons:
  - = The East of England (and TG north) offer a unique competitive advantage in terms of the range and quantum of bio-energy waste resources, as fuel stock
  - = The location offers the unique and time-critical opportunity of diversifying the existing automotive and wider engineering/ electronics supply chain and skills based that evolved to serve Ford at Dagenham
  - = TG will also be host to one of the largest post-war house building programmes, offering the opportunity to design-in and build-in both large but particularly small scale[1] dispersed community N&R energy infrastructure

1.5 We therefore recommend that EEDA and its partners consider taking this proposition for the UK Bio-Energy Centre to the next stage, (to stage 2) of the business case making process.

1.6 The evidence and rationale behind this recommendation are summarised below and set out more fully in the executive report, with supporting detail in the technical report.

[1] Up to 3MWe

The opportunity, the need

- The region has a real opportunity to establish a competitive N&R energy cluster/ supply chain that serves both domestic (regional and UK) needs but that also increasingly exports goods, knowhow and services globally.
- The cluster will drive innovation, it will develop and apply technology, engage in the design, production and distribution of both components and finished equipment serving the bio-energy (and potentially the wider N&R) energy markets – regional, UK and global.
- The cluster will also drive innovation and investment in related supply chains:
  - It will drive innovation and investment in the bio-energy waste processing supply chain. The East of England and Thames Gateway areas offer a unique competitive advantage in terms of the range and availability of potential waste (for a wide range of demonstration plants).
  - And it will drive innovation and investment in the bio-energy (and wider N&R energy) deployment, operation and management supply chain – this represents an equal if not even greater cluster development opportunity, involving installing, operating and maintaining a wide range of bio-energy (and other N&R energy) technologies in households, in residential areas, in business premises and in business parks and industrial estates. Technologies will include large scale facilities but particularly small scale community facilities enabling distributed local energy networks. The Thames Gateway offers an especially unique opportunity in this regard as it will be home to substantial new housing/ community development
- The cluster could be very substantial in scale given the rapidly evolving scale of demand/need for N&R energy not just in the UK, but across wider Europe and globally. This is driven by policy and consequent regulatory and incentive changes, in response to the 2020 N&R energy targets, which in turn will drive demand.
- Ensuring availability of appropriate skills, at technician level and higher, along with rapid investment by the business base are essential if the full opportunity is to be achieved. International experience suggests that this is often most effectively achieved through a combination of attracting inward investment bringing skills, knowhow and stimulating supply chain demand, coupled with diversification of existing relevant industry and the associated skills base. The Thames Gateway (north) area offers a unique advantage in this regard, through the time-limited opportunity for diversification of the automotive supply chain established to serve Ford at Dagenham.

Need for public sector intervention

- International experience shows that very large clusters can be built up from very little in new very high growth global industries, characterised by strong domestic and international demand, if the right conditions are in place. The first and critical step is to establish an initial presence in the sector and then to provide opportunity for rapid and substantial expansion.
- International experience suggests that the conditions required to establish an initial presence and facilitate rapid expansion include one or more of the following:
  - Attracting major inward investment, particularly foreign direct investment (FDI)
  - Diversification of existing industry and associated skills base
  - Creation of a dynamic cluster of SMEs that will drive innovation, with potential rapid growth of one or more of these
  - Establishment of a 'technical university' or college specialising in the specific technical (and enterprise/ business needs) of the sector

- = A critical mass of translational (near to market) research – including design, testing, prototyping and pilot scale up activities
- = Securing one or more governmental or third sector research organisations, regulatory/approval/ testing/ design standards function.

- The UK, the region, is starting from a very low base with a zero or at best embryonic presence in the sector, and so needs to find a way of achieving at least several of the above conditions for success.
- International experience suggest that one of the most effective ways of achieving one or more of the above 'critical success factors', and thereby kick-starting the cluster, is through the creation of a park, a campus, a centre that provides a combination of small business space with the specialist technical facilities and support required, in association with a 'technical university or college' facility dedicated to the specific technical and business needs of the sector, along with substantial available land to attract and accommodate FDI/ governmental or third party research/ etc.
- The centre achieves several critical things:
  - = It addresses the acute market failure faced by SMEs which need access to technical equipment, technical space, technical support and skills – SMEs cannot usually afford these or access these within their own premises, they also cannot easily access these through collaborating with universities because university campuses are generally not designed to offer large scale prototype equipment or test facilities
  - = The centre helps remove any hurdles and obstacles to attracting critical FDI through providing serviced plots with appropriate planning and other approvals, with a developer that understands and is committed to servicing the specific needs of the sector. Inward investors will also be attracted by the provision of technical space, pilot and live facilities, by proximity to skills, to skills-based training and to a potential supply chain.
  - = The centre puts N&R energy firmly on the map, stimulates interest, raises awareness and therefore, on the one hand helps attract more inward investment, domestic investment, more start ups, more skills – and on the other hand – stimulates domestic demand through raising awareness and increasing familiarity with what is today, a largely unfamiliar practice but which could become increasingly familiar and common place, with respect to bioenergy applications
  - = The centre can also become the focal point for wider support to the industry, in the locality, in the sub region, in the region and across the wider South East and to an extent, across the whole of the UK. We can see the centre becoming an initial catalyst and critical component of the region's and the UK's bio-energy and wider N&R energy innovation community[2]

[2] International experience shows that region's with strong innovation communities achieve the greatest levels of innovation. There is a mass of academic and policy literature that cites that a strong innovation community is closely associated with (and probably a pre-requisite for), high levels of innovation. An innovation community (IC for short), includes all the key actors such as knowledge generators (typically universities, governmental and third party research organisations); the business base (large firms, inward investors and particularly small firms) and intermediaries (comprising public sector agencies providing policy support and private sector intermediaries such as venture capital providers, early stage funding providers, technical, legal and financial services). An effective innovation community is enabled by extensive 'human networking' where high proportions of the key actors regularly network, meet, understand each other, share experience and ideas, explore opportunities and collaborate. Those regions with very high levels of human networking (and thus very effective innovation communities) usually achieve this with the help of a dedicated secretariat/ resource that breaks down key boundaries and brings the key actors together. International experience suggests that high levels of human networking are unlikely to occur on their own, without the aid of a

- The market, even pre-recession, is unlikely to provide the initial phase of such a facility because the risk-return profile is negative – but – if public sector is able to step in and pump prime phase one of a scheme, it is then likely that the market (both development market and supply chain) will take over could expand in such a way that the remaining phases, would require little or no public sector assistance.

The impact, net cost and VfM

- Potential net additional impacts are therefore substantial and, because it is very probable that once public sector intervention has 'kick started' the centre and the cluster, that the market will then lead development (of both the remaining phases of the centre and of the cluster), the requirement of public sector funding is largely restricted to 'pump-priming' and the sum required is relatively minimal when set against the total cost/ investment. We calculate that the scheme, divided into three phases will require c.£25m public sector funding but will generate a capital value when complete of c£750m, with the remainder of the investment being provided by the private sector[3][4].

- VfM is therefore also good – we envisage a 3-phase scheme with the initial phase comprising an incubator, central services, hub, technical yard space, technical covered space, appropriate infrastructure and technical equipment, with c. 6 small scale operational facilities for demonstration, testing and training; phases 2 and 3 may include additional incubators and technical space, a dedicated training centre and a dedicated visitor centre (depending on demand), but will focus on making available serviced plots for larger scale manufacturing, office and laboratory space (depending on demand)

  = Phases 1 and 2 are estimated to generate (on and off-site) just under 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[5]

  = And with phase 3 completed, 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.

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dedicated secretariat. Innovation communities can embrace all sectors or can combine several more 'sector specific communities'. The N&R sector will already have an embryonic community in the region, but one that is almost certainly suboptimal. Renewables East is already providing a networking support role for the N&R energy innovation community but the centre provides a specific opportunity to act as a focal point, a hub, for the bio-energy innovation community, possibly also providing a dedicated 'networking support' resource, that will help optimise human networking within the bio-energy innovation community, and to link this/ embed this, via Renewables East in the wider N&R innovation community and wider innovation community.

[3] The figure of £25m public sector funding requirement includes securing access to all the land required for phases 1-3, site servicing and infrastructure for phase 1 only, provision of an incubator and central services hub, technical yard space and technical covered space, with grid access and supporting technical infrastructure. It does not include the option of providing a dedicated FE/HE training facility (initially the training function can be accommodated in the central services hub) and it does not include the option of providing a dedicated visitor/ exhibition facility (again, initially, the central services hub can play this role). If dedicated facilities are to be provided, the financial model as it stands, assumes that they would be funded via other funding sources but with significant industry contributions.

[4] This is only a broad estimate at this stage and needs to be refined in the second stage of the business planning process. Even then, the final value may vary, and moreover, public sector may need to provide some additional funding to enable the delivery of subsequent phases. The stage 2 business planning process will need to use sensitivity analysis to explore the potential variations. For now, we have assumed that £25m pump priming funding will be sufficient.

[5] Please note though that phase 1, on its own, generates few additional jobs and is relatively expensive, therefore returning a very high cost per job and low GVA leverage. This is because phase 1 is largely capacity building and paving the way for subsequent phases. The return on phase 1 could be improved by shifting some of phase 2's employment space into phase 1.

The risks

- There are risks but by adopting a phased approach to the centre, these can be substantially minimised. We would in fact suggest that it is more a case that public sector needs to take a risk in this critical field, if the region and UK are to move towards achieving the ambitious 2020 N&R energy targets and if the region/ UK are to optimise the chance of establishing a market share in what will be one of this and the next decades' very high value, high growth global industries.
- Successful parks, campuses, centres, elsewhere in Europe, that have created successful clusters serving the high growth global industries of the last two decades (electronics, telecoms, ICTs, life sciences), have achieved substantial scale, of c. 8-10m square foot, even dwarfing the vision being put forward here (for up to 3-4 million sq ft). Thames Gateway is part of one of the largest conurbations in Europe, providing a large domestic market, and, N&R energy will be a high growth global industry, characterised by growing domestic and international demand, suggesting perhaps that even 3-4m sf. may under represent the full long term potential.

The opportunity is immediate but if immediate action is not taken, the full scale of the opportunity will not be realised. Speed to market is in fact critical. If the scheme cannot be developed and operational within two to three years, the region may be too late

Next steps

- We suggest the following next steps:
  - = Identification of two and ideally three potentially feasible sites, in the Thames Gateway (north) area, that meet the site selection criteria identified, and that particularly that will enable rapid delivery of phase one
  - = Exploratory discussions (soft market testing) with the developers/ owners, to ascertain interest in responding to an appropriate OJUE JV procurement process (in discussion with EEDA), to test the scheme concept and financial/ demand metrics
  - = Stakeholder consultation and communication strategy – in discussion with EEDA
  - = Advanced discussions with potential inward investors, progressing the original discussions held so far
  - = Discussions with government departments exploring scope to establish a bioenergy standards/testing/approval function on site
  - = In parallel, review of current education and training provision in the sub region at FE and HE level, including identification of planned courses and discussion with the principals/ VCs of the most relevant institutions to explore interest in linkage/ collaboration with the scheme, potential requirements, funding and costs
  - = Preparation of stage 2 business cases for each of the two/ three potential schemes, enabling detailed options appraisal - including outline master plan/ design, more detailed specification of the infrastructure, support and other components of phase 1; more specific costings and financial appraisal, analysis of the labour market, skills and potential supply chain capacity in the travel to work areas of each scheme, full economic appraisal
  - = Implementation of the appropriate OJUE JV tendering process.

2. Executive Report

Introduction

2.1 Renewables East has identified the opportunity and need to establish a centre that provides technical support, facilities and space for businesses (start ups, small, medium and large, including inward investors), to help 'kick-start' and support the growth of a dynamic, innovative bio-energy cluster in the region.

2.2 Renewables East recognised that the region (and the wider UK) are far behind its European competitors regarding the design, manufacturer and deployment of bio-energy technology and that a dedicated centre would help reverse this, thus ensuring that the region benefited from what will be a very high growth, high value global industry and at the same time, helping achieve the region's and the UK's ambitious 2020 N&R energy targets.

2.3 Adroit Economics Ltd and The Asset Factor, with technology advice from AEA Group, were commissioned to assess the validity of the above proposition and to prepare a green-book based, stage 1 business case for a scheme.

2.4 Key findings and conclusions are set out below in this 'executive report', with further detailed provided in a 'technical report'.

Opportunity/need

2.5 There will be major growth in the New and Renewable (N&R) energy market in UK (and wider Europe and indeed globally), in the short, medium and longer terms. This will be driven initially by the UK's and wider international carbon emission objectives and as part of this, by the 2020 N&R energy targets, requiring that 15%[6] of our energy is derived from N&R sources. To encourage and enable this, the Government is in the process of introducing a combination of regulatory and incentive changes which are expected to generate consumer demand (from businesses, public sector organisations and particularly households).

2.6 The 2020 targets are an initial catalyst and it is anticipated that demand will continue for N&R sources of energy beyond 2020.

2.7 There are a number of different N&R (market specific) technologies and these are at different stages of development: (see AEA Group report).

2.8 This scheme is focussing on bio-energy because:

- Of the scale of demand (see the extract from the AEA Group report below)
- Because other N&R sub sectors (such as wind) are already catered for
- And because the East of England offers a unique competitive advantage through the range and quantum of waste-sources available, coupled with proximity to one of Europe's largest conurbations and hence largest potential market.

Bio energy is a high growth global market
Extracts from the AEA Group report
▪ Bio energy is one of the most promising sources of renewable energy in the UK, the EU and worldwide. Not only is there a large array of feedstock resources from energy crops such as miscanthus to fuels derived from wastes i.e. waste wood or biogas from anaerobic digestion, there is also a wide variety of methods available to extract the inherent energy. It is a flexible fuel which can be used directly 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 a range of thermal and biological

[6] Overall 20% for the European Countries.

conversion processes.

- The current bio energy market is significant. In 2004 renewable fuel sources provided 13.1% of the world's total primary energy supply; of this 79% was supplied by biomass. In the UK in 2007 renewables accounted for 5.2 million oil tonne equivalents, 82% of which was supplied by biomass. It is expected that the development of renewable energy will continue to increase both nationally and internationally as Governments seek to improve their security of energy supply and reduce their contribution to climate change. As a result bio energy is expected to continue to make an increasing contribution to the global energy mix.
- In particular, bio ***energy is projected by the UK Government to make the single biggest contribution to achieving the UK's 15%*** target of energy derived from renewable sources by 2020. This has resulted in the development of policies favourable to bio energy, such as the banding of the Renewable Obligation and the forthcoming introduction of the Renewable Heat Incentive. The UK Government's forthcoming Renewable Energy Strategy (due for publication in June 2009) is also expected to be favourable towards bio energy and will set out the approach to its wider deployment to achieve the UK's targets. Bio energy is complex both in technical and policy terms but it ***is poised to deliver approximately half of the contribution towards the 2020 renewable energy targets.*** As a result the bio energy market is expected to develop significantly to 2020.

Source: AEA Group – executive summary

2.9 AEA Group report that:

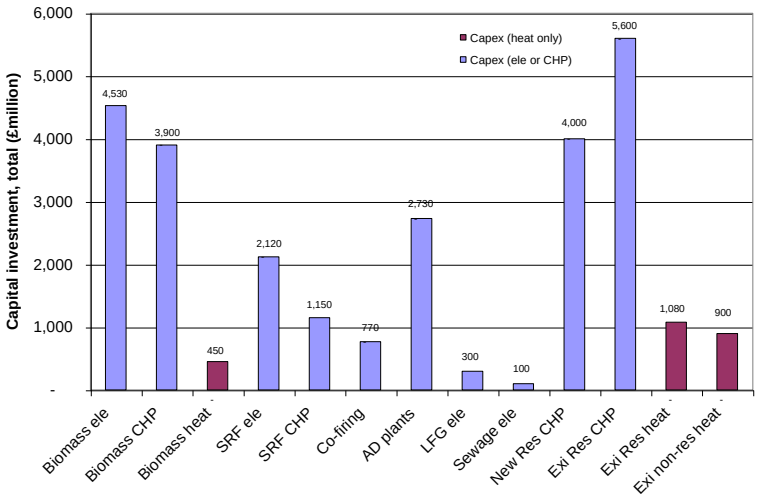
- Bio energy is poised to deliver approximately half of the contribution towards the 2020 renewable energy targets, as practically all of the technologies are considered to be ready and sufficiently robust to deliver the contribution to transport fuels, electricity and heat. Importantly biofuels are flexible, as they can be stored and used on demand.
- Many of the large scale biomass electricity and CHP plants are at advanced stage of planning and application.
- At the smaller scale however, the bio energy technologies are considered to be proven but their deployment will be influenced by financial incentives.
- Research and development is continuing and is much needed to bring about technological developments that allow greater use of biomass and/or improve biomass conversion efficiencies. These include:
  - = Development of anaerobic digestion (advanced)
  - = The development of advanced generation bio fuels (i.e. from lignocelluloses)
  - = Gasification and pyrolysis that enable various fuels to be produced, for ease of use

2.10 Achieving the 2020 targets and beyond will require:

- Large scale manufacturing, installation, operation and maintenance of proven N&R technologies
- Development of supporting waste supply chains
- Incremental improvement of proven technologies and their deployment, and research, development and testing of emerging technologies
- Associate skills development.

2.11 This will require and generate substantial investment, as indicated by AEA GROUP's chart below.

Capital investment in bio energy required for the UK to meet its 2020 targets
Extract from the AEA Group report



Source: AEA Group – executive summary

2.12 The following tables provide definitions of the different types of bioenergy.

Definitions	
Biomass schemes	▪ The likely feedstocks for this category are wood processing residues, energy crops and selective agricultural or agro-industrial residues. A significant proportion of this is expected to be imported. Energy crops would include short rotation coppice such as willow and eucalyptus.
Solid recovered fuel	▪ These are basically solid fuels that have been derived from the biological component of commercial, industrial and municipal wastes. These can include the biological waste wood, arboricultural arisings (such as stem wood, branches, foliage from tree surgery operations) and dry animal manure.
Co-firing	▪ The feedstock will be mainly chipped or pelletised wood residues or waste from agricultural origin. Again a significant proportion would be imported.
Wet waste AD	▪ The feedstocks can include livestock slurry and manures, sewage sludge, mixed biodegradable waste from municipal solid waste, separately collected food waste from households, commercial premises and industrial processing facilities and strong (high BOD, COD) effluents from industry.
Landfill gas	▪ The feedstock for this is mainly that of municipal origin that is biodegradable and has already been deposited in landfills.
Sewage gas	▪ This refers to the biogas generated from the anaerobic digestion of sludge generated at sewage treatment works, operated mainly by water companies.
Built environment (CHP and heat schemes)	▪ This refers to the urban areas comprising commercial and residential premises, including both existing and new build. Feedstock will vary but is likely to consist of logged, chipped or pelletised wood residues.
Other	▪ Although not considered in the projections, the scope of bioenergy in the future will also be derived from second generation biofuels (i.e. those that recover cellulosic material from woody materials) as well as by oils and biomass from marine and algae biomass.

Labels		
Biomass technology combination		***Label***
Biomass	Ele only	Biomass ele
Biomass	CHP	Biomass CHP
Biomass	Heat only	Biomass heat
Solid recovered fuels	Ele only	SRF ele
Solid recovered fuels	CHP	SRF CHP
Biomass co-firing	Ele only	Co-firing
Wet waste to biogas	Ele only	AD plants
Landfill gas	Ele only	LFG ele
Sewage gas to ele.	Ele only	Sewage ele
New build residential	CHP	New Res CHP
Existing residential	CHP	Exi Res CHP
Existing residential	Heat only	Exi Res heat
Existing non-residential	Heat only	Exi non-res heat

The issue/ the gap

2.13 The UK has limited supply chain capacity and the skills-base and expertise required to deploy existing and further develop the proven technologies, and so, in the first instance will tend to import the plant, the expertise, servicing and maintenance (from wider Europe); the UK also has very little translational research capacity regarding the new evolving technologies.

The objective

2.14 The objectives for the region (and wider SE/ UK) are to:

- Accelerate demand for and deployment of N&R energy in the region/wider SE – including and particularly in large numbers of residential communities (new and existing) – in order to help the UK meet its 2020 targets
- Develop a skills base and supply chain that can take on some of the servicing and maintenance, and that ideally can engage in manufacturing the components and finished plant – to meet UK needs, but potentially also to meet wider European needs (e.g. exporting rather than just importing equipment and expertise)
- Increase the region's (and UK's) translational research and commercialisation capacity to help drive incremental improvements regarding the proven technologies and to help develop and commercialise the new technologies – key components of growing translational and commercialisation capacity will be:
  - University (and other research organisations') translational research capacity

= Large company RD&D

= And a growing innovative SME supply chain that undertakes increasing RD&D

= And, given the importance of government policy and regulation in the adoption of technology solutions, a close working relationship with relevant departments for testing and accreditation.

Rationale for intervention

2.15 The objective for Renewables East is to advise EEDA and its partners regarding:

- The extent to which the market will deliver the above objectives
- If it will not, the nature and causes of market failure that need to be addressed
- And the best option for addressing these that will maximise impact, soonest, at least cost and at best VfM
- Thus contributing to two of EEDA's core objectives: growing innovation clusters and reducing carbon emissions.

Evidence of market failure is crucial

2.16 If (with appropriation EU/national) regulatory and incentive changes, the market and supporting research organisations are likely to largely deliver the above objectives, without intervention, then there is no need for EEDA or its partners to take any action (other than perhaps to promote/ applaud success).

2.17 The only reason for taking major direct action is if the market and supporting research organisations, together, are unlikely to deliver the above objectives at all, to a materially lesser extent or within a reasonable timeframe.

2.18 If any or all of these are the case, then there is a case for considering intervention – BUT – it is vital that the selected package of intervention (of support):

- Is limited to addressing the specific areas of market and institutional failure that are likely to frustrate or prevent the above objectives
- Directly tackling the causes of these failures
- Adopting intervention methods that maximise private sector investment, that open up competition and stimulate proper working of the market
- And that generate sufficient quantum of impact to achieve the goals but at least cost to the public purse, thereby maximising VfM
- And directly addresses EEDA's stated RES priorities (related to changing energy consumption patterns and reducing CO2 emissions, and supporting its ambitions to strengthen the regional knowledge-generating clusters – which specifically includes renewable energy and Cleantech)

2.19 Adroit has consulted with a sample of UK firms already in the bio-energy sector and with potential inward investors in order to identify hurdles, obstacles and barriers to will frustrate, slow and may even halt the sector's development. Principle issues are:

- Access to suitable RD&D space and equipment – for prototyping, piloting, scale-up trials and demonstration
- Access to skills and technical support
- Funding

2.20 AEA Group, from their wide international experience of the bio energy sector, also report the issues development of the sector faces:

- Research in the bioenergy arena is likely to focus on a number of key areas:
  - Technological development i.e. improved efficiencies with particular focus on developing gasification, pyrolysis, advanced anaerobic digestion, advanced generation biofuels and small scale CHP technology
  - Developing appropriate fuels feedstocks i.e. non food crops, algae etc.
  - Sustainability and lifecycle analysis i.e. supply chain issues assessing sowing, growing, harvesting, transporting, processing, conversion; and
  - Emission investigation and abatement.
- Although it is recognised that bioenergy will make a significant contribution to the UK's 2020 targets, the UK will need to address a significant number of challenges:
  - Scaling up to achieve commercial maturity of bioenergy technology options in order to achieve more competitive costs in comparison to existing options, including fossil fuels and other renewable energy sources;
  - Development of robust supply chains in both feedstocks and technology;
  - The existing skills shortage/gap that exists. Measures will be needed to develop the technical skills necessary to deliver the bioenergy targets;
  - Supportive policies and legislation will need to be adopted to ensure the bioenergy market can develop to meet the needs of the 2020 targets;
  - Increased buy-in from stakeholders particularly the public, local authorities, planning authorities and politicians to ensure they are aware of the environmental, social and economic benefits of the technology and to reduce the potential for opposition to developments.

2.21 It is clear that the sector faces a range of issues (both market and institutional), requiring prompt targeted public sector action.

There are a number of tools in the intervention tool kit

2.22 Experience drawn from other regions/ countries regarding supporting the N&R sector, coupled with relevant experience drawn from supporting other technology sectors, suggests that a range of potential actions are available for any region to consider utilising to support growth of the sector. These include:

- Demand-stimulation
  - The principal driver will be regulatory and incentive changes at UK level, but at the level of a region some measures are available such as - awareness raising, demonstration, exhibition, promotion
- Supply stimulation
  - Translational research/ pre-commercialisation support – funding, business and technical support, access to specialist space, facilities, equipment, increased networking/ collaboration and partnering opportunities, technical, enterprise and innovation training and skills
  - Commercialisation – targeting FDI, provision of ideal sites in ideal environments, supply chain and skills development, increasing access to market

2.23 All are important. Some can be delivered virtually, across the region, from or at a variety of locations, but some are space dependant – especially the provision of technical development and test space and equipment and support (for SMEs) and to assist training. This suggests either enabling SMEs to access existing facilities (if they exist, which they do not) or building some sort of centre that provides these, will be required. Moreover, international experience suggests that providing a specialist park, campus or centre that not only provides these facilities but provides ideal sites in an ideal environment for inward investors and domestic firms also plays the important additional roles of facilitating FDI and supply chain development – and of providing a visible symbol of a rapidly growing cluster which helps put the new sector on the map, literally.

2.24 We have seen how other UK regions have successfully developed similar centres to support other key technologies – for example, ONE Northeast's centres of excellence, two of which stand out as particularly exemplary[7]

2.25 For these reasons, some form of bio-energy focussed facility would seem to directly address many of the market failures cited above and indirectly address others. Whilst it may not be the only intervention required, ***it represents a major intervention and important first step***.

The preferred option – a UK Bio-energy Centre

2.26 Options appraisal (based on green book guidelines), suggests a preferred option – creation of a UK Bio-energy Centre that will provide the space, facilities and support to enable and accelerate translational research, development, commercialisation, training and wider supply chain development

2.27 The aims of the centre will be to:

- Grow a specialist SME cluster (on the centre and in the wider area) – by providing a combination of appropriate business space, infrastructure, test facilities, small scale live operational plant and supporting technical services – to enable SMEs to develop, test, manufacture and promote components/ finished units/ technical service and support expertise. These facilities will be available to and targeted at SMEs who locate at the centre but also to SMEs in the wider area, to help encourage and support diversification into the N&R sector. These facilities will also enable SMEs and relevant university research teams to collaborate in translational/ piloting/ proto-typing activities (that would not be possible within the university campus).

  = Rationale:

  - Many SMEs seeking to develop and commercialise N&R technology (and Cleantech) will find it hard/ impossible to do many of these things within their existing premises and will lack the specialist expertise and support required
  - The campus will also play a major role in encouraging and enabling SMEs in related industries to diversify into N&R technology development and commercialisation – thus contributing to the priority the RES attaches to commercialisation of science and technology in the region

- Grow a bio-energy (and wider N&R energy) skills base and supporting education and training capacity - a parallel and equally important aim of the centre, in association with the area's HE/FE base, will be to provide a focal point for development of a bio-energy (and wider N&R energy) skills base in the region – through accommodating (some form) of specialist training facility, but linked back to N&R training in the wider education base (particularly technician level in the college network) but also to specialist courses that may

[7] Adroit has recently evaluated the Northeast's innovation infrastructure, which included certain of the centres of excellence and advised on future investment plans for the successful schemes. The most relevant of these is NaREC, at Blyth, Northumberland, supporting the commercialisation of off-shore wind, including attracting investment from leading global firms. Also of relevance is the Centre for Processing Industries at Teesside (CPI), which although in a different sector has provided similar technical and commercial space to enable increased innovation and commercialisation.

evolve in the HE network. Key skills to be developed will include research, design and development (RD&D) and component/ finished kit manufacture, but also testing and approval and safety expertise, instillation, serving and maintenance, accompanying business, marketing and enterprise/ innovation skills. The test and pilot equipment on the campus will also offer a unique 'hands on' training opportunity

= Rationale:

- The above skills are almost nonexistent in the region (and in the UK); moreover there are shortages in wider Europe and globally
- The major growth forecast for N&R provides a major (post recessionary) employment opportunity
- Conversely, the growth of a specialist N&R SME cluster depends on availability of appropriate skills across the range
- Although there is a dearth of bespoke N&R skills (or supply chain) in the region, the foundation potentially exists in the form of the region's traditional engineering supply chain and associated skills base (associated with automotive industry for example). Experience from other regions suggests that there is considerable opportunity for diversification of the supply chain and skills base. Timing is good in that without a clear plan for the remaining automotive skills they may be lost forever to the region in the current recessionary cycle

- In the medium to longer term, attract a major European/ global manufacturer – the campus will ideally include a series of larger sites (plots) that can accommodate large established manufacturers, research or other relevant organisations. Securing one or more larger operations will considerably accelerate the scale and critical mass of the cluster, generating significant additional job opportunities, supply chain opportunities and technology/ knowledge transfer opportunities

  = Rationale:

  - Although one or more of these activities may come to the region without the centre, more are more likely to come and/or sooner, with the centre and moreover, they will be much more effectively embedded in the region as a result of the centre and the growing critical mass of bespoke N&R skills and supply chain

Role of the UK Bio-energy Centre

Extract from the AEA Group report

- The focus of Centre should be on technology that delivers heat and CHP to the built environment (this is likely to be at the small scale) and anaerobic digestion.
- There is unlikely to be significant opportunities for the Centre in the production of technology for large scale plants, biofuels or in co-firing, although there will be opportunity in the supply of support services to these sub-sectors.
- The Centre should aim to incorporate stakeholders from a broad spectrum of the bioenergy supply chain and stages of technology development. It should look to include demonstrator plant and facilities to enable R&D to be undertaken as well as office space, testing and certification facilities, and scope for industrial activities.
- A training centre should be included within Centre dedicated to training on bioenergy technologies. 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 and need to be expanded massively through training

Source: AEA Group – executive summary

Location of the UK Bio-energy Centre

2.28 The study identified a number of 'location types' across the region and evaluated these, using a semi-quantitative scoring process, against key criteria.

2.29 The location types considered were:

Location Types	
Area	***Site type***
Thames Gateway 1	Existing Industrial
Thames Gateway 2	Former Brown Field
Thames Gateway 3	New Development Site
M11 Corridor	Existing Industrial
M11 Corridor	Former Brown Field
M11 Corridor	New Development Site
Cambridge 1	Existing Industrial
Cambridge 2	Former Brown Field
Cambridge 3	New Development Site
Elsewhere in EoE 1	Existing Industrial
Elsewhere in EoE 2	Former Brown Field
Elsewhere in EoE 3	New Development Site

2.30 The criteria used to evaluate each location type were:

- Available site of sufficient scale for growth on demand (c.100 acres+)
- Appropriate planning use
- Ability to achieve timely delivery
- Availability of regeneration and other funding and meeting wider regeneration ambitions
- Proximity to legacy supply chain/ skills base
- Proximity to local new communities - as trial customers for new local distribution networks
- Opportunity to create a high tech, clean, green park as a demonstrator and improve waste/biomass industry brand image

2.31 The criteria were weighted to emphasize the most important.

2.32 The resulting analysis suggested, over-whelmingly, a location in the Thames Gateway (north) area, favouring existing industrial land, to enable speed to market.

Weight scores			
Area-type	***Site-type***	***Score***	***Comparative %***
Thames Gateway 1	Existing Industrial	59	100%
Thames Gateway 2	Former Brown Field	52	88%
Thames Gateway 3	New Development Site	44	75%
M11 Corridor	Existing Industrial	42	71%
M11 Corridor	Former Brown Field	35	59%
M11 Corridor	New Development Site	33	56%
Cambridge 1	Existing Industrial	35	59%
Cambridge 2	Former Brown Field	29	49%
Cambridge 3	New Development Site	21	36%
Elsewhere in EoE 1	Existing Industrial	37	63%
Elsewhere in EoE 2	Former Brown Field	38	64%
Elsewhere in EoE 3	New Development Site	27	46%

Specification of the centre

2.33 The initial phase of the centre will be quite modest but international experience shows successful clusters can reach 8 million sq ft plus in scale. International experience also makes it clear that if sufficient land is not ring fenced at the outset to accommodate potential growth, then the possibility of large scale growth will have been prevented even before the first brick is laid. It is possible, but not certain, that the centre could trigger the growth of a very significant bio-energy (and wider N&R energy) cluster, perhaps reaching 3, 4, 5 million sq ft. We suggest that sufficient land is ring fenced to support c4 million sq ft. This translates into land take of c. 125 acres dependent of course on final development densities.

2.34 The centre's development would be phased, over three phases. Public sector will initiate the process and take a lead role in phase1 to kick start the process, but subsequent phases would be demand led, with the option of halting at any phase, should demand not materialise.

2.35 The full scheme could comprise a combination of:

- Incubator space (over time say 3 'buildings' each of 30,000 sq ft) offering a mix of office, laboratory and workshop space
- Hard stand/yard space for pilot testing feedstock storage
- Small scale operating or pilot plant sites (say 6x 1 acre plots) with connections into the grid for any energy outputs
- A training room(s), meeting room(s) for class style learning (10,000 sq ft)
- An amenity building 'coffee shop plus' and function space (10,000 sq ft)
- Optional items to be considered (but NOT included in the financial numbers discussed below)
  - = A special purpose visitor centre (base case assumes use of common reception space in Incubator and training space may suffice) of potentially 20,000 sq ft for business and general public
  - = A dedicated affiliated FE/HE training facility perhaps of some 100,000 sq ft +

2.36 ....and large elements of the park would be traditional office and production factory/showroom space.

Impacts of the campus

2.37 ***Sources of impact***

2.38 The anticipated impacts of the campus therefore derive from:

- Accelerated growth of a specialist N&R supply chain in the region (SMEs locating on the campus and SMEs in the wider area) through diversification of the legacy engineering (and other relevant) sectors, through new starts and through inward investment
  - = Initially supplying the regional/UK N&R market (particularly the residential market), but potentially also exporting goods and services back to Europe and globally
- Accelerated deployment of N&R instillations in the region/ UK, thus helping the UK meet its 2020 targets.

Sources of net additional jobs and GVA

2.39 Resulting net additional investment, jobs and GVA (on and off campus) will derive from:

- Front-end R&D – small scale
- Translational research/ piloting testing/small operating plants – substantial scale
- Manufacture of components and finished kit – very substantial
- Supporting regulatory, technical and design services
- Supporting business services – legal, funding, consultancy
- Deployment, operation and maintenance – substantial
- Wider supply chain supporting deployment, operational and maintenance – particularly the feed stock collection, processing and delivery sector

2.40 The campus will also contribute (directly and indirectly) to wider environmental sustainability objectives in terms of helping the region contribute to the 2020 objectives, resulting in reduced CO2 emissions, etc as these are key priorities in the RES….any operating plants will connect into the gas and electricity grid where viable.

Net additional jobs and GVA estimates

2.41 We have prepared high level estimates of net additional jobs and GVA that the scheme could generate:

- Onsite jobs and GVA
  - = Phase 1 could generate just over 100 net additional jobs on-site and £4.6m GVA
  - = All three phases could generate just under 7,200 jobs onsite and just over £300m GVA
- Onsite + construction + offsite (supply chain) impacts
  - = Phase 1 could generate just over 200 net additional jobs on-site and £10.5m GVA
  - = All three phases could generate just over 8,300 jobs onsite and just over £375m GVA

2.42 These impact figures do not include wider catalytic impacts i.e. the impact of the centre and large scale cluster and supply chain on the overall extent and rate of development and adoption of bio-energy in the region.

Economic Impact of Bio Energy Park		
PHASE 1	***Net Additional Jobs (FTEs)***	***Net Additional GVA (£)***
Construction	-	-
On-site	106	4,587,733
Offsite (Supply Chain)	107	5,935,947
TOTAL	213	10,523,680
PHASE 2	Net Additional Jobs (FTEs)	Net Additional GVA
Construction	92	5,136,534
On-site	3,554	154,163,103
Offsite (Supply Chain)	231	12,736,932
TOTAL	3,876	172,036,569
PHASE 3	Net Additional Jobs (FTEs)	Net Additional GVA
Construction	92	5,136,534
On-site	3,535	153,361,991
Offsite (Supply Chain)	616	34,004,923
TOTAL	4,243	192,503,448
ALL PHASES	Net Additional Jobs (FTEs)	Net Additional GVA
Construction	184	10,273,068
On-site	7,195	312,112,827
Offsite (Supply Chain)	954	52,677,802
TOTAL	8,332	375,063,696
Source: Adroit Economics		

2.43 We also have not, in this stage one business case, estimated other impacts, such as:

- Contribution to the region's low carbon objectives and the consequent economic impact of this (i.e. shadow carbon pricing for example)
- Contribution to recovery from recession and the cost savings and wider positive impacts of this
- Contribution to other sustainability objectives such as use of brown field land

2.44 .....these can begun to be modelled in the stage two business case, when a specific locality and site have been identified

Procurement strategy

2.45 The priority is to maximise private sector investment and minimise the need for public sector subsidy and to achieve early delivery recognising that the opportunity and need exists today if government renewable energy targets are to be met.

2.46 The options appraisal process considered a number of procurement options. The preferred option is:

- For the public sector to identify the total land required, and ensure access is secured, through a combination of direct purchase and options. Land held by an existing developer is likely to be more attractive as the resultant JV structure will provide greater cost certainty, expertise to manage key elements of the development process and potentially will allow the public sector to pass certain delivery risks on to the private sector where value for money can be achieved
- The likely strategy is that the public sector will need to fund (albeit delivered perhaps by the private sector partner as described above), initial on and off site preparation and services for phase 1
- The public sector then funds the build of (again potentially delivered by the private sector partner) the initial incubator and training rooms, the technical yard space, technical covered space, and base-facilities. Companies already engaged in the N&R energy market are then invited (through an appropriate competitive process) to construct small scale operational plant – as both operational but also for pilot, test and training purposes. Construction is funded by those companies on land probably leased to them by the public sector on flexible terms
- Remaining 'pilot plant' plots are marketed to operators/ developers to purchase/ lease and design and build facilities/ space on.
- Later phases of either further incubator buildings and 'traditional' office and showroom/factory space will be undertaken by marketing the opportunity nationally and internationally and then selling/leasing serviced plots to either owner occupiers or where an interest is only as a tenant, by venturing with a developer (likely to be the original land owner developer), for the delivery of the required facility with subsequent sale of the building to a longer term investor

2.47 Through this sequential, phased process, which is largely demand responsive, public sector minimises the pump priming role/investment it needs to provide, and moreover, through appropriate claw back arrangements, may, if the centre is successful, create the opportunity to claw back some or all of the initial grant.

Overall control, management and operation of the campus

2.48 To ensure that the campus focuses on its objectives and is not diverted by market, shareholder or investor pressure, to pursue alternative objectives, the scheme should draw on best practice from science park management. This will involve creation of some form of trustee vehicle that will ensure the campus remains true to its objectives, but has sufficient flexibility to optimise opportunities, as they emerge, within this context.

2.49 Successful Centres/Parks ensure sufficient focus is placed on the operational aspects of the Centre to help build the new 'Community'. The 'human interaction' between employees from differing companies and differing skill sets accelerates the technology innovation and the basic attractiveness of the Centre as a place to work and therefore a place to locate.

Gross and Net costs

2.50 At this early stage we have prepared high level (illustrative) cost and value estimates. These should be treated as a guide rather than as accurate estimates because the project is only at broad concept stage and the figures are necessarily therefore based on a range of assumptions and

judgements. It will be possible to prepare more specific estimates in phase 2 of the work, when a specific site (or sites) has/have been identified and a master plan and outline designs can be prepared and costed.

2.51 This exercise is also being carried out at a time when values in the property sector are falling sharply and benchmarking largely impossible. Over time a stabilised market will appear although the longer term implications of the credit crunch and ensuing recession on property values due to changing banking/financial markets are not yet know. The following numbers have been derived from a logical model, but for all these reasons must be treated as a guide only at this stage.

2.52 There are two ways of viewing the costs and financial performance of the scheme:

- From the private sector's perspective – where the emphasis is on whether the risk-return profile of the whole scheme is sufficiently positive
- From the public sector's perspective – where the emphasis is on the amount of pump priming (gap funding) required to make the scheme stake-up, so that the risk-return profile is sufficiently positive to attract the private sector

From the private sector perspective

- Gross costs for the full 4m sq ft+ ultimate scheme could be as high as c.£755m
- On past value models the ultimate scheme may be 'worth' some £835m.
  - = The implied value add of £80m is, however, below that at which the private sector would undertake a project of this scale and risk.
  - = A more standard value add of £105m on total costs of £755m **would suggest a 'funding gap' of £25m.**
- This gap is of course very sensitive to changes in the total cost and to the total value equation which in turn will change if any one assumption is varied.
  - = For example if the end sales value of the total park where to fall by only 10% or c.£80m whilst there would be some related cost reductions the funding gap would grow by say £70m.

From the public sector perspective

- The proposed strategy is intended to mitigate this exposure however by the phased approach suggested. i.e. the public sector restricts its activities as described above to 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. The Private sector will deliver to these longer term users as their covenant to take space and pay rent is a traditional property sector 'product'.
- Pricing this level of intervention again **suggests a funding need of c£25m** which is 'spent' on:
  - = Land, planning and infrastructure say £18m
  - = Incubator and pilot facilities £7m
  - = 'Soft' development costs (management, marketing, agents, professional fees) £3m
  - = If it is assumed the incubator and pilot facilities have some value say £5m then a £23m (say £25m) funding need arises.

Variation

2.53 The total public sector funding requirement, as noted, could vary significantly if future phases do indeed require some assistance. As a contingency it might be appropriate to build in an additional £10m public sector funding requirement for each of the two subsequent phases. The possible need for further funding can be considered in more detail in the stage 2 business case making when specific sites (and costs) have been identified and the potential variations can be explored through sensitivity analysis. At this stage, we are working with a public sector funding requirement of £25m.

Exclusions

- It should be noted that the above £25m funding does not as previously stated cover the cost of a full specialist visitor centre (at 20,000 ft say £5m) nor an FE facility (at 120,000 ft say £30m). These and other options would need to be explored as the project progresses in particular following discussions with FE providers.
- Neither does the figure cover revenue (operating costs) which will include traditional estate management, a technical support team, and management and operation of the incubators, visitor and training facilities. At this stage, we have assumed that these costs will be covered either by occupiers, by other funding streams and by any revenue generated through sale and lettings or through consultancy (similar technical support teams in similar centres elsewhere in the UK, appear to cover revenue costs through consultancy income after an initial 18-24 months period of establishment)
- As noted above, strategies can be developed to seek to claw back through overage arrangements some of this public money if subsequent development demand creates extra value. Moreover, when engagement begins with existing land owners it may be possible to agree phased land payments through use of options (particularly in the current property market)

2.54 Firmer numbers for the initial phase of intervention would follow identification of a 'real site' and when master plan and cost planning exercises have been completed. Further comfort on the long term value add would follow more direct dialogue with global and national renewable energy company when their expansion plans are discussed

Private sector funding leverage

2.55 Private sector leverage is therefore potentially very substantial, but depends on the success of the scheme:

- If demand is such that only phase 1 is justified, private sector leverage is relatively minimal
- But if the scheme evolves into a large dynamic bio-energy cluster/ supply chain and all phases are built out, then private sector leverage is very substantial (namely c. £.25m net (public sector funding) to £0.755m gross (private sector funding).

VfM

2.56 We have calculated the return on public sectors' investment of £25m in terms of:

- Cost per net additional job
- Net additional GVA leverage per pound invested

2.57 Phase 1, because it is essentially capacity building, with little assumed business occupancy, represents a very expensive intervention with a cost per job figure of £227,000 (and if off-site jobs are included, of £112,000).

2.58 The return on public sector investment really only occurs in phase 2 onwards[8],

- With on-site cost-per-job metrics of:
  - = c. £6,400 (for phases 1&2) falling to £3,300 (for all phases)
- And with on-site and off-site cost-per-job metrics of
  - = c.£5,800 (for phases 1&2) falling £2,900 (for all phases)
- With on-site GVA leverage metrics of
- c. £6.83 (for phases 1&2) rising to £13.43 (for all phases)
- And with on-site and off-site GVA leverage metrics of
  - = c.£7.61 (for phases 1&2) rising £15.63 (for all phases)

VfM				
Value for Money	***Public Sector Cost per Job****		***Public Sector GVA Return per £invested***	
Phase 1 - Onsite	£	226,927	£	0.19
Phase 1 - On and Offsite	£	112,559	£	0.44
Phase 1 and 2 - Onsite	£	6,397	£	6.83
Phase 1 and 2 - On and Offsite	£	5,869	£	7.61
All phases - Onsite	£	3,253	£	13.43
All phases - On and Offsite	£	2,880	£	15.63
Source: Adroit Economics				

Risks and mitigation

2.59 The following risks have been identified and mitigation strategies suggested:

- Speed to market
  - = A site needs to be secured on which phase 1 can be delivered rapidly (ideally with the site available and incubator and facilities ready of use within 24 months), or the region may have missed the opportunity
- Sufficient land, capable of realising the full vision, cannot be identified and secured
  - = This would be highly problematic, preventing the campus from achieving its full potential, even before the first brick has been laid. It is therefore vital that sufficient land is available and secured. Land need not necessarily be a contiguous site but clearly preferable

[8] Although, if phases 1 and 2 were reshaped, such that phase 1 included some of phase 2's commercialisation, this would considerable improve VfM metrics for phase 1.

- The scale of demand envisaged, does not materialise

  = The phased nature of development coupled with taking 'options' on land for phases 2 and onwards, allows flexibility, including the decision to deliver only phase 1 if demand is not sufficient

  = Exposure to medium and long term property value is mitigated by the Public sector leaving later phase development to the market with claw back arrangements where possible

  = Exposure to cost and time overruns is mitigated by the Public sector leaving later phases to the market and ideally on the early 'intervention' phase working with an existing land owner developer who will have pre-existing site knowledge and may take on delivery risk for the initial facilities

Conclusions

2.60 We recommend that EEDA and its partners consider taking this proposition to the next stage (stage 2) of business case making, on the following grounds:

- The centre will significantly increase the chance and rate of the region establishing and growing a significant dynamic, innovative cluster and supply chain serving the high growth, high value bio-energy (and wider N&R energy) markets – in the region, wider UK and internationally – where none exists at present
- It will do this by directly addressing the principal blockages, hurdles and barriers that will frustrate, slow and even prevent the growth of the cluster – (namely, directly addressing the chief market obstacles/ market failures)
- It will do this by leveraging the region's assets/ competitive advantages in the form of a wide range and quantify of bio-energy feed stocks, potential to rapidly evolve a supply chain through diversifying Thames Gateways (north) automotive supply chain; and proximity to a very large market (one of the largest conurbations in Europe and one subject to very major new housing development – in Thames Gateway)
- After initial public sector pump priming investment, it is anticipated that the market will lead development and funding of the remainder of the scheme. Thus the Centre will generate high private sector investment leverage, and once sufficient critical mass has been achieved, it will return good cost per job and GVA leverage figures
- If successful, which although never certain, but likely, the centre will generate significant net additional jobs and GVA, diversification and re-skilling; it will provide a powerful post-recessionary employment opportunity and will help accelerate deployment of N&R energy thus helping the region (and UK) achieve its ambitious 2020 N&R energy targets.

2.61 Adroit has helped prepare business cases for a wide range of major technology infrastructure supporting high growth clusters and benchmarked against these, this particular scheme has all the hall marks of potential success.[9]

Suggested Next steps

2.62 We suggest the following next steps:

- Identification of two and ideally three potentially feasible sites, in the Thames Gateway (north) area, that meet the site selection criteria identified, and that particularly that will enable rapid delivery of phase one

[9] Adroit has established a data base of some 50+ major global clusters. Analysis of the data base indicates some common themes, for example, concerning initial triggers/ catalyst, critical success factors, potential scale of development, key players/ key agents, resulting employment, etc.

- Exploratory discussions (soft market testing) with the developers/ owners, to ascertain interest in responding to an appropriate OJUE JV procurement process (in discussion with EEDA), to test the scheme concept and financial/ demand metrics
- Stakeholder consultation and communication strategy – in discussion with EEDA
- Advanced discussions with potential inward investors, progressing the original discussions held so far
- Discussions with government departments exploring scope to establish a bioenergy standards/testing/approval function on site
- In parallel, review of current education and training provision in the sub region at FE and HE level, including identification of planned courses and discussion with the principals/ VCs of the most relevant institutions to explore interest in linkage/ collaboration with the scheme, potential requirements, funding and costs
- Preparation of stage 2 business cases for each of the two/ three potential schemes, enabling detailed options appraisal - including outline master plan/ design, more detailed specification of the infrastructure, support and other components of phase 1; more specific costings and financial appraisal, analysis of the labour market, skills and potential supply chain capacity in the travel to work areas of each scheme, full economic appraisal
- Implementation of the appropriate OJUE JV tendering process