

Report to: **Executive**
Date: **12 June 2007**
Report of: **Executive Member for Regeneration**
Subject: **Geothermal Research Education and Training (GREAT) Institute Proposals**
Ward: **All**

1.0 Purpose of the Report

- 1.1 To inform members of the potential of a research and development institute for Geothermal Research to be located within the District.
- 1.2 To agree to progress the concept through a detailed feasibility exercise to explore its potential and establish how it will work. This will be undertaken in partnership through the agreed commissioning of consultants in partnership with Newcastle University, and other steering group members, as part of the Regions Science City concept.
- 1.3 To agree to the signing of a Memorandum of Understanding to demonstrate a commitment to exploring the concept attached in appendix 2.
- 1.4 To agree to a contribution to the detailed feasibility study, the next phase of the development process and to act as the client body for the commission.

2.0 Consultation

- 2.1 Consultation upon this report has been undertaken with the Director of Regeneration and Development, the Chief Executive, the Leader of the Council and the Executive Member for Regeneration.
- 2.2 Consultation has also taken place with Heads of Service and various staff within the Regeneration and Development Directorate.

3.0 Background

- 3.1 In September 2005 Easington District Council and the University of Newcastle commissioned consultants to draw up a concept development paper and a funding prospectus for the GREAT Institute project. The concept paper considered the UK energy policy context for the development of micro-generations (see definition in appendix 1), including geothermal energy; developed the basic components of the project and identified the potential economic and environmental benefits of clustering geothermal research and related business activity in Easington. This has been undertaken to address the emerging and increasingly important policy issues relating to energy that have been brought forward in recent years.
- 3.2 The 2003 Energy White Paper sets out the UK Government's commitment to a new, low carbon economy and to encouraging access to a wide range of energy sources and technologies that will contribute to the target of a 60% reduction in CO₂ emissions by 2050. The Government has consulted widely on its new micro-generation strategy and this launched in 2006. The timing is therefore opportune.
- 3.3 The Dti study forecasted that by 2050, with a reasonable range of subsidy and public policy levers, micro generation technologies have the potential to bring about a 14-18% reduction in UK domestic CO₂ emissions. It points out that the UK lags well behind the rest of Europe with less than 100,000 micro generation installations in the UK. Most of these are solar water heaters.
- 3.4 The partners wish to present Easington as the UK's leading low carbon and sustainable low cost energy location – by establishing the area as a unique and integrated, large-scale demonstration platform for geothermal micro generation and

low carbon buildings over the next decade – and to extend the benefits of this throughout the North East, the whole UK and beyond.

3.5 The District Council acted as client and commissioned a study to be undertaken by consultants Shared Intelligence to produce a concept paper to gain support for the idea in December 2005. This has resulted in support from One NE, GoNE, the sub regional economic partnership, the New and Renewable Energy Centre (NAREC) as well as written support from Rt. Hon Tony Blair, MP and has helped ensure that a commitment to developing the proposals are embedded with the Regional and Sub Regional Economic Strategies. The concept is now included within the Tyne and Wear City Region's, Science City initiative as a key action in the energy and environment strand.

3.6 This study has been completed and the partners are now in a position to take the proposals forward through a more detailed feasibility study. Copies of the prospectus are available from the Regeneration and Partnerships unit on request.

The main outcomes of the study are as follows: -

3.7 Conclusions of the Report

3.7.1 The prospectus sets out the case for the establishment of the GREAT Institute as the focus of an ambitious project that will make Easington an international centre of excellence in the development and application of micro-generation, with a particular emphasis on geothermal heat pump technology. This will be possible as a result of the unique geology of the area, the research expertise of the Universities of Newcastle and Northumbria and the presence of an ambitious business cluster, which is already collaborating to secure new economic opportunities for the area. It will complement the leading edge work already being undertaken in renewable energy in the North East.

3.7.2 The GREAT (Geothermal Research Education and Training) Institute will be the flagship for the entire project, providing a focus for research and development, engaging local communities in the science of micro generation and geothermal energy and providing training to ensure that local businesses and residents can access employment opportunities.

3.7.3 The partnership commitment to the GREAT Institute is gaining momentum with the two Universities, Easington District Council, a group of key regionally - based businesses and the local college all signed up to the project. Newcastle University has also engaged successfully with the key players of the global geothermal research and industry communities.

3.7.4 The project is closely aligned to UK policy regards micro generation, low carbon buildings and the application of renewable heat. It provides an opportunity to demonstrate the technical and economic viability of geothermal technologies in the UK in support of DTI and DEFRA policy. It is also well aligned with One North East's commitment to renewable energy and its focus on cluster development and addressing worklessness in the region's most deprived areas. Finally the GREAT Institute project complements the progress being made at NaREC (New and Renewable Energy Centre), with its focus in areas such as off - shore wind, wave and fuel cells. There are considerable opportunities for NaREC and the Institute to work together.

3.7.5 The Institute is to be an integral part of the Newcastle Science City programme, energy and environment strand, a key priority of the Regional Economic Strategy, and will be a flagship for an integrated investment programme that builds on

- the international research expertise of the University of Newcastle
- the unusually diverse geology of the Easington area
- the presence of an ambitious business cluster which is already collaborating to secure

new economic opportunities for the area with a particular focus on Ground Source Heat Pumps (GSHPs).

- 3.7.6 The aim will be to establish a research and development expertise that will lead market intelligence in GSHP science and micro geothermal technologies and therefore stimulate market activity through innovation and knowledge. It is anticipated that in the first instance over 300 jobs and over 20 new businesses could be developed with further benefits when leading edge businesses in the field agglomerate as they become more established and widespread.

3.8 The Vision for the Development

- 3.4.1 The key components of the project will be:

Knowledge creation – the University is developing a unique geothermal science and engineering research and development programme as part of the Science City Programme, forging relationships throughout the world and proposes to establish a major research presence in Easington

Demonstration project – partners in Easington, via the East Durham LSP, will establish a district-wide programme of demonstration projects for micro-generation and low carbon building technologies, capitalising on planned and extensive public / private investment in new schools, housing and other facilities in particular GSHPs.

Education and employment – GREAT will attract learners at all levels but with a particular focus on vocational learning, involving the Universities, local college, the Local Skills Council (LSC) and local businesses.

New joint venture company – EasiGeothermal Ltd will capitalise on market opportunities for GSHP (Ground Source Heat Pumps) technologies and compete for large-scale UK contracts from its base at the Institute.

Community engagement – the Institute will spread the benefits from the Newcastle Science City programme; the *Easington* visitor attraction will engage local people and visitors on the history – and future – of energy in County Durham.

- 3.4.2 Ground Source Heat Pumps (GSHPs) take advantage of the thermal energy stored in the soil or groundwater to provide space heating, chilling or domestic hot water and the electric energy converted greatly exceeds the input needed to run the heat pump.
- 3.4.3 From a geological perspective Easington is unusually well suited for GSHP research, development and demonstration.
- 3.4.4 The UK Government is committed to a 60% reduction in CO2 emissions by 2050 and the recent Energy Review identifies GSHPs as one of the technologies that can contribute to this target. The UK lags behind the rest of Europe with less than 700 systems installed. For comparison Sweden has over 180,000 GSHP systems. A recent report estimated that the UK could achieve a market of almost £300m a year by 2020.
- 3.4.5 EasiGeothermal Ltd believe that the company could generate a substantial turnover and support several hundred jobs in the North East if this market can be exploited, particularly through involvement in some of the major public and private sector building programmes throughout the UK, such as schools, hospitals and new housing.
- 3.4.6 It is currently envisaged that a building of approximately 5,000 m²/sq will be required to accommodate a range of activities as a flagship development on a high profile business site with high standards of design and research facilities (the preferred location is currently the proposed Hawthorn Prestige Business Park, although this will be subject to a site options appraisal). The total cost of the development could be in the region of up to £10M exc VAT. Proposed activities will include:

- Research and test laboratories – housing environmental and geothermal energy technologists
- Teaching and training rooms – with capacity for higher education students and vocational trainees
- EasiGeothermal Ltd – company HQ
- Business development and incubation units – accommodating new companies in suites of offices and workshop space
- Institute management and public demonstration space – housing the central management facilities, conferencing and exhibition space and the visitor resource centre

3.4.7 The building will be a demonstration project in its own right, incorporating many of the Institute's sustainable technologies and micro-generation within its innovative design.

4 Position Statement – Advancing the GREAT Concept

4.1 Next Steps Recommended by the Prospectus:

a) The partners will take the prospectus and use it to consult further with key potential partners and participants, including One NorthEast, NaREC, the key research councils, East Durham and Houghall Community College and the Carbon Trust.

b) In the summer of 2007 the partners will commission a full Feasibility Study and Business Plan that will incorporate an appraisal of options for the development and delivery of the project and a set of capital and operating cost and income projections. The partners will wish to consider a range of different delivery models and internal funding arrangements in due course, as part of the Feasibility Study and Business Plan process.

4.2 A project steering group has now been established between the Council and Newcastle University and has progressed the first stage of the concept to establish a development prospectus (outlined above).

4.3 This work has informed the sub regional economic strategy and investment programme whereby it has been established as a sub regional priority for County Durham. In addition to this a Project Initiation Form has been completed to secure Single Programme funding from the Regional Development Agency (One NE).

4.4 One NE have approved in principle funding to support to the next phase of feasibility work and are currently helping to facilitate the completion of a business case to release the required funding from the sub regional Single Programme allocation.

4.5 The next phase of work will require the steering group to be extended and it is proposed a Memorandum of Understanding will be required to sign up to progressing the development of the Institute. The Steering Group members that are to be key partners are District of Easington, Newcastle University, One NE, East Durham and Houghall Community College and the sub regional economic partnership.

5.0 Implications

Financial Implications

The financial implications at this stage will be a contribution of approximately 15% of the value of the commission towards the first phase requirements. An amount of £35,000 has been identified and allocated within the Use of Reserves Budget. The total cost of the feasibility work will be subject to a tendering exercise although it is anticipated that this will be in the region of £230,000 exc VAT. Any future implications

to be considered will be explored within the feasibility work and are subject to further reports.

The costs are proportional to the size of the development in such exercises. For example the feasibility work to bring forward a detailed business case, new legal / operating structure and design works were approximately 2.5 - 3% of total build costs of the proposal. Given the size, scale, uniqueness and quality required for such a scheme such high levels of expenditure on feasibility work for this proposal is unsurprising. The brief will be phase into 2 phases to minimise financial risk (i.e. the more cost intensive elements of detailed design and phasing will not be brought forward until an agreed viable and detailed business plan is in place). The District Councils contribution is expected to be matched by Newcastle University and the balance will be supported by One NE via Single Programme Funds, subject to approval.

Legal Implications

There are no legal issues in relation to this report, although future legal implications may arise in relation to the initiative particularly regarding operational legal arrangements of the Institute, the physical development of the building, intellectual property rights and future delivery arrangements. This would be reported at the appropriate juncture.

Policy Implications

The GREAT Initiative is highlighted as a priority within the Regional Economic Strategy, the emerging sub regional economic strategy, the final draft Regeneration Statement, the Draft Climate Change Strategy for the District and is recognised as being fundamental in progressing the Regions contribution towards the Governments carbon neutral policy agenda and targets.

Risk Implications

A risk assessment has been completed and the necessary actions required to effectively managing what are currently nominal risks. A full risk register is to be established as part of the commission.

Communications

Consultations will be a key part of the commission and will press and publicity arrangement at the appropriate time. A communications and marketing plan is to be established as part of the commission. A press release will be arranged in tandem with the agreement of this report.

6.0 Corporate Implications

Corporate Plan and Priorities

This initiative would directly support the Councils overall mission statement 'To Make the District Great', it would also contribute most significantly to the Councils priorities of; 'A Sustainable Job for Everyone', 'Learning Opportunities for All', and 'Clean, Tidy Communities'.

Equality and Diversity

The report has no additional implications for Equality and Diversity

E- Government

The report has no additional implications for E-Government

Procurement

There are no current procurement implications, other than the procurement of the commission will be required to comply with the conditions of Single Programme Funding as well as the requirements of Standing Orders and OJEU thresholds.

7.0 Recommendations

- 7.1 The Executive notes the information relating to the recommendations made in the phase 1 prospectus and the progress of the development concept for the GREAT Institute.
- 7.2 The Executive agrees to progress the concept to implementation stage through the commissioning of a detailed feasibility study.
- 7.3 The Executive Members agree to the signing of a memorandum of understanding to demonstrate commitment to exploring the concept and that the signing of the Memorandum of Understanding be delegated to the Director of Regeneration and Development in consultation with the Executive Member for Regeneration.
- 7.4 The Executive Members agree to commit up to £35,000 of the total cost of the agreed commission and act as client for once approved to enable progress to the next phase of feasibility. The costs of which are to be committed from the Use of Reserves Budget.

Background Papers/Documents referred to

1. GREAT Institute Prospectus, Dec 2006
2. Regional Economic Strategy
3. Sub Regional Economic Partnership Investment Plan 2007
4. The GREAT prospectus (phase 1 study)

Appendix 1:

Micro-generation Definition

Micro-generation is any technology connected to the electricity distribution network with a capacity below 50-100kW and generally supplying individual customers and buildings. The Energy Saving Trust (EST) include solar photovoltaics, wind turbines, small hydro-electric schemes, active solar water heating, hydrogen energy, bio-energy, small scale combined heat and power (CHP) projects and ground source heat pumps (GSHPs) within their definition.

The UK Government is committed to a 60% reduction in CO2 emissions by 2050 and the recent Energy Review identifies a key role for micro-generation in contributing to this challenging target. The UK lags behind the rest of Europe with less than 100,000 micro-generation installations (mostly solar water heaters) but EST believe that, with a policy commitment and a reasonable range of subsidies, micro-generation could reduce UK domestic CO2 emissions by up to 18% over this period.

Appendix 2:

DRAFT MEMORANDUM OF UNDERSTANDING

Proposed Development of the GREAT Initiative, Easington, County Durham.

Parties to the Memorandum of Understanding (signing parties)

District of Easington Council	Newcastle University
One North East	East Durham & Houghall Community College

The Purpose of the Memorandum

This memorandum of understanding is a statement of intent, which forms a solid and proactive commitment by the signatories to realise the development of a Geothermal Research Education and Training Initiative at the proposed Hawthorn Business Park, Co Durham or other preferred venue subject to the outcome of a site options appraisal proposed to be undertaken within the feasibility study. It aims to promote joint working and collaborative endeavour. It is intended to serve as a general guide, fostering co-operation between the respective parties and to allow the necessary flexibility in activities that are undertaken between them. It outlines basic roles and responsibilities and should be used for agreeing protocols. Such protocols will form the basis of working arrangements between the relevant public sector partners.

The memorandum of understanding is not intended to be legally enforceable, to create any legal right or obligation on any of the parties hereto.

The Project

The project involves exploring the feasibility and delivering a National exemplar development to understand, exploit and establish new commercial markets relating to Geothermal energy. The development should aim to deliver the following objectives:

- to exploit the unusually diverse geology of the Easington area (ideal for demonstration and training purposes)
- to create an ambitious business cluster to secure new economic opportunities with a particular focus on Ground Source Heat Pump Technology (GSHPs).
- to foster knowledge creation by establishing a unique geothermal science and engineering research and development centre of excellence developing an international research centre of expertise.
- establish a Nationally recognised demonstration project by establishing a district-wide programme of demonstration projects for micro-generation and low carbon building technologies, generating wider uptake throughout the region and beyond
- generate education and employment opportunities – GREAT will attract learners at all levels, involving the Universities, the local college, the LSC and local businesses.
- establish a new joint venture company – EasiGeothermal Ltd to capitalise on market opportunities for GSHP technologies
- develop a new visitor centre and encourage community engagement – the *Easington* visitor attraction will engage local people and visitors on the history and future of energy in County Durham

Responsibility of the Partners

In order to achieve the above vision, the parties will work in partnership, ensuring that:

- The overall objectives of the whole GREAT initiative are achieved, as well as those of individual elements of the scheme

- The balance of the impact on time, cost and quality is considered on all decisions
- The procurement processes, including the feasibility study process, land acquisition, construction and commissioning are managed in an efficient and collaborative manner, and
- The building requirements are developed to enable the incorporation of efficient and effective use of space within the facilities, and that there is a collaborative approach to the future management of the initiative.
- That the balance of the overall objectives are retained in continual review by all partners to safeguard all interests of key partners
- Each Party will treat Confidential Information disclosed to it by the other Party as secret and confidential and will not except with the prior written consent of the other parties make disclosures, this will at an appropriate juncture be formalised through a Confidential Disclosure Agreement to be signed by all partners.

Other Partners

Stakeholders with a legal or other interest in the project will be appropriately engaged so as to ensure the redevelopment proposals are discussed and developed in an ethically correct way. Any conflict will be managed in accordance with protocols to be agreed.

Management and Delivery Arrangements

A Partnership comprising the signatories to this document will deliver the project. A Project Board will direct the project, which will be supported by an officer-working group and the appointment of a core staff to establish a project team if considered appropriate within the feasibility study process.

The Project Board & Officer Working Group

The Project Board will comprise of one representative from the District of Easington Council, Newcastle University, East Durham and Houghall Community College and One North East. The XXXXXXXXXXXX will chair the Board.

The Board will:

- Provide strategic direction and delivery solutions
- Review this Agreement to ensure its continuing application
- Invite other representatives to assist and advise on particular issues, as appropriate
- Meet as required by the ongoing needs of the project to discuss, guide and approve the way forward
- Make decisions on a consensus basis with a protocol for informal dispute resolution
- Direct the working group and / or any staff to undertake the necessary actions arising from the Board Meetings to take the project forward

The officer-working group will comprise representatives of the above organisations and ????? ANOthers????.

Communication

The Project Board will jointly agree a communication and engagement/involvement strategy for stakeholders and other interested parties. The strategy will guide the means by which the development of the project will be communicated. It will also set out the organisational requirements of each partner.

Duration and Termination

The Memorandum of Understanding will remain in force for an initial period of 3 years and thereafter for such period as the parties may agree as being appropriate in the circumstances at that time.

The Memorandum may be reviewed from time to time to assess its continuing suitability.

Any party wishing to withdraw from the agreement will give 6 months notice.

Risk Management

A proactive approach to risk management will be adopted by the sponsoring partner organisations to minimise risks to the project. Best practice risk management provides processes and activities to identify potential project problems early in a projects lifecycle. Timely, cost effective mitigation and fallback plans will therefore be prepared to manage potential risks to the project. This will be achieved by:

- The preparation of a project specific Risk Management plan in which all management processes, reporting metrics and techniques are defined
- A Qualitative Risk Assessment where Risk Registers and associated fallback plans and mitigation actions are developed and maintained throughout the life of the project
- Quantitative Risk Analysis, where the project schedule is analysed using statistical techniques to provide confidence levels for the dates of the key project milestones.

Signatories

<i>District of Easington Council</i>	
<i>Newcastle University</i>	
<i>One North East</i>	
<i>East Durham and Houghall Community College</i>	

Dated.....