CHESHIRE EAST COUNCIL

Cabinet

Date of Meeting:	22nd July 2013
Report of:	Director of Economic Growth and Prosperity
Subject/Title:	Crewe Deep Geothermal Energy Centre
Portfolio Holder:	Leader / Cllr David Brown, Strategic Communities

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1.0 Report Summary

1.1 This report seeks approval to progress the Crewe Deep Geothermal Energy Project by approving in principle the use of a 1 hectare site at Leighton West, Crewe, owned by Cheshire East Council, to investigate the potential for Deep Geothermal Energy generation.

1.2 The first stage of the project will undertake a feasibility study to test the overall benefits/risks of the opportunity and in particular carry out a site investigation and assess whether any planning and site specific or environmental health constraints might affect delivery and scope out the delivery which would be of optimum benefit to the Council and the local community.

1.3 Subject to the outcome of the feasibility study, the land will then be offered as a Joint Venture, lease opportunity or direct development to explore energy generation. Further full site appraisal and necessary planning consents will be taken forward through the most appropriate delivery model and will test the viability for a deep geothermal drilling site and associated district heating network.

1.4 The Council would benefit financially from future energy generation on the site and also be at the forefront of renewable energy generation utilising the natural assets of the Borough. The location of the site adjacent to Bentley and other employers, in addition to the proximity to wider residential communities means that this project may present major opportunities for wider benefits for employers and residents of Crewe in relation to energy costs and energy security.

1.5 The Council is seeking external grant funding to support the underwriting of risk. Although the project was unsuccessful in securing funding from Regional Growth Fund, other funding opportunities are being explored, including ERDF. This would greatly assist leveraging in private sector investment, therefore, giving greater confidence to potential developers. This model has been used successfully in France and Germany, where the geothermal energy industries are far more developed than in the UK.

1.6 With the potential to provide 100% of the heat requirement for Cheshire East, and as one of only six places in the UK suitable for geothermal energy, the resource in the Cheshire Basin is of national importance. By supporting the exploration of deep geothermal energy, the Council has a unique opportunity to be at the forefront of the growth of the geothermal industry in the UK.

2.0 Recommendations

2.1 Cabinet is requested to

1. support the selection of the Leighton West site as the preferred site, as described in Appendix 1;

2. note that a viability study will carry out a site investigation and assess whether any planning and site specific or environmental health constraints might affect delivery; the work will be funded by virement of existing budget as described in para. 7.1; and

3. delegate the decision on the route of delivery to the Portfolio Holder, Chief Executive and Director for Economic Growth and Prosperity.

3.0 Reasons for Recommendations

3.1 The project relates directly to the Council's key priority: *A growing and resilient local economy.* It is also prioritised in the Council's Three Year Plan:

- Outcome 2: *Cheshire East has a strong and resilient economy*,
- Outcome 4: *Cheshire East is a green and sustainable place,*
- Priority 1 (*Local Economic Development*), and
- Change Project 1.3 (*Investment to support business growth*).

3.2 Due to the high level of upfront investment at risk required for a deep geothermal drilling project (currently estimated to be £27m), the Council is not in a position to undertake the project directly. Instead, it has been identified that the Council could bring forward this project by leasing its land to a private developer or entering into a Joint Venture Agreement.

3.3 This enables the Council to take the first step to initiate the development of the geothermal industry in Cheshire East without the need for significant upfront financial investment.

4.0 Wards Affected

4.1 The Leighton West settlement covers the wards of Crewe St Barnabas, Leighton, and Wistaston. Whilst the drilling site will be located in Crewe St Barnabas ward, Leighton and Wistaston wards may also be affected due to their close proximity to the site.

5.0 Local Ward Members

5.1 Cllr Roy Cartlidge (Crewe St Barnabas), Cllr Derek Bebbington (Leighton), Cllr Margaret Simon (Wistaston), Cllr Jacqueline Weatherill (Wistaston).

6.0 Policy Implications

6.1 The project has the potential to secure significant new investment and jobs for Cheshire East, supporting the Council's key priority to achieve: *a growing and resilient local economy.* It is also prioritised in the Council's Three Year Plan:

- Outcome 2 (*Cheshire East has a strong and resilient economy*),
- Priority 1 (*Local Economic Development*), and
- Change Project 1.3 (*Investment to support business growth*).

6.2 The project also supports the Council's 'Ambition for All' Sustainable Communities Strategy (2010-2025) by promoting a step change in local production of energy from renewable sources.

7.0 Financial Implications

7.1 The project will require spending of £96,000 over 2 years in order to fund the advertising as part of the procurement process, specialist legal and procurement advice, and necessary site investigations into the feasibility of the scheme. As preparatory costs in relation to a potential capital development, it is suggested that they can be funded by virement from the feasibility study budget (i.e. part of the capital financing revenue budget); subject to approval to move forward on this initiative.

8.0 Legal Implications

8.1 The Council can rely upon the general power of competence provided by the Localism Act 2011 to investigate and exploit the opportunity of extracting geothermal energy from its own land.

8.2 It is proposed that a viability study be commissioned to report on both the suitability of the site and the appropriate route of delivery. This study will also identify the most effective legal and procurement mechanism by which to offer this new and unique opportunity to the market in order to secure best value for the Council from the opportunity.

8.3 Planning permission will need to be sought and granted (in addition to other permissions) in order that the land can be used for its intended purpose. Whilst it is noted that the planning application will be made by the intended provider, a public consultation will take place as part of that process.

8.4 It is understood that external public funding is being sought for this project. If funding is secured, the terms of funding will need to be reviewed and legal advice provided (in particular any repayment terms).

8.5 Further, if funding is being made available by a Council to a supplier then consideration must be given to whether there are any State Aid implications. State Aid may arise where the Council provides aid to selected undertakings (any entity which puts goods and services on the market) which has the potential to distort competition and effect trade between member states of the European Union. However, this advantage may be mitigated as the intention is to offer the opportunity to the market such that every provider is being offered the funding on the same terms.

9.0 Procurement Implications

9.1 Dependent on the outcomes of the viability study, it is likely that either a Restricted or Open procurement process will be undertaken in line with EU Procurement Law. On condition the service element of the contract can be specified, either of these procurement routes would be appropriate. The contract value needs to be determined and specified and under either the Restricted or Open process it must be noted that negotiation throughout the process is not permitted.

9.2 Subject matter experts will be required in order to inform any specification and tender process, and the up-front funding agreed takes this into account.

9.3 It is essential that as part of the process, no work is undertaken without a signed written contract being in place.

9.4 Other than a lease agreement, it may be necessary to form and include other conditions of contract which will need developing.

10.0 Planning Implications

10.1 The site at Leighton West has been identified in the Cheshire East Local Plan Development Strategy as a potential site for geothermal exploration. The site forms part of a larger Council-owned site to the north of Pym's Lane which is a preferred strategic site within the Development Strategy of the Cheshire East Local Plan. The proposals in the Development Strategy are now being refined in response to the consultation in January/ February 2013 with Councillors, and taking into account other appropriate evidence to prepare the submission version of the Local Plan Core Strategy later this year.

10.2 Whilst it is acknowledged that one delivery option is for the site to be leased, with the responsibility for obtaining planning permission transferred to the developer, there will be a reputational risk to the

Council as landowner if any barriers to development on the site are not fully investigated.

10.3 As such, there are a number of key planning considerations relating to this project, which require careful assessment, and it is recommended that early engagement is made with Development Management to provide full comprehensive pre-application advice. These will need to be held in addition to separate discussions concerning the wider masterplan for the Leighton Green site to inform the Cheshire East Local Plan Core Strategy.

10.4 The site identified on the masterplan is an old landfill site which was operational until the mid 1980's. The wider area around that site is also identified as former landfill, although the Council has less detailed records of this. It is understood that the old landfill was restored by means of a dilute and disperse method, and as such is unlikely to have been capped and potentially has a complicated gas regime.

10.5 Development on a landfill site is one of the most problematic development scenarios encountered and presents a high level of risk. It can potentially cause a range of significant problems/risks to the environment and human health which need to be fully assessed. This includes potential for disturbance of harmful substances; combustibility of fill material; emission of flammable/toxic gases (landfill gas); geotechnical problems creating unstable conditions for building/construction; problems with such things as odour, site drainage, and mobilisation of leachate into surrounding water resources such as the adjacent Leighton Brook. These factors could potentially present a major constraint, and extensive assessment to inform the feasibility of the scheme will be included in the viability study as part of the £96k requested, so as to understand the risks, and effect on the viability of the scheme.

10.6 Any development on this site will require planning permission. It is likely that the planning application will need to be accompanied by an Environmental Impact Assessment. In view of the complicated site constraints on this site, it is anticipated that a suite of environmental assessments will be required to inform the preparation of this planning application. These are likely to have significant time and cost implications, and some aspects such as protected species surveys, could be time constrained and need to be taken into account when the programme is developed. The timescales for obtaining planning permission is likely to be lengthy due to the complex nature of issues presented. A significant period of consultation will be required with internal and statutory consultees prior to preparing any planning application. Equally engagement with the local community will be required well in advance of any planning application being submitted. As the full site investigation has not yet been carried out, it cannot be guaranteed that planning permission will be granted.

10.7 It has been recommended that early feasibility assessments are carried out before going forward, in view of the history of landfilling and potential problems this could cause given the proposed end use. This will be carried out within the £96k budget identified.

10.8 It is likely that a range of other consents may be required from other statutory bodies such as Environment Agency, including groundwater investigation and abstraction licences. Early engagement with these parties has been established.

10.9 Aside from the potential issues arising from development on a landfill, key planning issues associated with the development of geothermal energy on this site include

- consideration of flood risk area directly to the north of the site and potential harm to the integrity of Leighton Brook culvert;
- development close to the pylons on site;
- significant noise and vibration impacts associated with drilling, and the operation of the generator/pumps 24 hours a day over 7 days a week, in view of the proximity of both existing and potential new sensitive receptors (if the adjacent land is developed);
- potential for significant contamination of groundwater, the aquifer and nearby watercourses arising from the drilling process and operation of the energy system;
- Need to understand the full geological and hydrological conditions on the site, along with method of water abstraction and circulation and the rate of hot water replenishment;
- Ecological implications on the site and wider area from both construction and operational aspects of the scheme;
- Potential highway and access implications, particularly associated with importation of substantial construction equipment such as drilling rigs.
- Landscape and visual implications of the scheme, particularly given the use of drill rigs of 50m for a 3 month period. The need for suitable mitigation for sensitive receptors will be an important consideration
- Impact on any above or below ground heritage assets
- Specific impacts arising from the geothermal process such as risk of ground subsidence and potential seismic risks.

10.10 It is recommended that early engagement with consultees is undertaken as a priority.

11.0 Risk Management

11.1 The fact that the site is on a former landfill, means that there are significant potential constraints to development. Therefore, there is a reputational risk to the Council if such constraints of the site are not fully investigated and made known to any potential developer. As part of the initial feasibility work, a site investigation and viability study will be carried out to ensure that the constraints on the site do not make it too technically difficult to develop.

11.2 Whilst a lease arrangement has been identified as one option for delivery, there is a risk that this option might not offer best value for the Council. The initial viability study will appraise all options to ensure that best value is secured.

12.0 Background and Options

12.1 Geothermal Energy has been exploited in the UK since the first usage of the Bath hot springs by the Romans, and is already a well established part of the energy supply mix in similar geological settings in Germany, France, Japan, Indonesia and the USA.

12.2 Geothermal energy is widely regarded as a sustainable, renewable and reliable source of heat and energy, with little or no visual, noise or air quality impact once in place.

12.3 In 2012, a report by global engineering firm Sinclair Knight Merz, entitled 'Geothermal Energy Potential in Great Britain and Northern Ireland', identified the Cheshire Basin as one of only six places in the UK with the potential to supply heat and electricity from geothermal resources. Subsequent data shows that there is potentially enough renewable energy in the Cheshire Basin to supply more than 100% of the heat requirement in Cheshire East. This is underpinned by the work of the British Geological Society which identifies the area around Crewe and Sandbach as the most geologically viable in the Cheshire Basin.

12.4 As such, a potentially suitable site on Council-owned land has been identified at Leighton West. The site has the unique characteristic of being in a geologically viable location, as well as having significant potential heat loads (users) in close proximity. Soft market testing has identified significant interest from potential nearby heat loads based on a desire for renewable energy sources and reduced energy bills.

12.5 The site at Leighton West has been identified in Local Plan Development Strategy as a potential site for geothermal exploration. The site is part of a larger Council-owned site to the north of Pym's Lane which forms part of a much larger preferred strategic site within the Development Strategy of the Cheshire East Local Plan. The proposals in the Development Strategy are now being refined in response to the consultation in January/ February 2013 with Councillors, and taking into account other appropriate evidence to prepare the submission version of the Local Plan Core Strategy later this year.

12.6 It is the aspiration of the Council that this site will provide renewable heat and possibly power for local use, to potentially include new housing developments and significant local employers in the vicinity of the site, subject to planning permission and necessary licences.

12.7 Five additional sites have been identified which are in Council ownership and which could be suitable for geothermal exploration. It is envisaged that by proving the viability of the technology in the Cheshire Basin, this initial project in Crewe will be the first step in the development of a new geothermal industry in Cheshire East.

12.8 Geothermal energy in the Cheshire Basin takes the form of Hot Sedimentary Aquifers. Therefore, in order to exploit the resource, boreholes would need to be drilled to approximately 4000m to access water a temperature of up to 100ºC. This water would then be pumped to the surface and used directly as a heat supply, or to produce steam to power turbines for electricity production. The works needed to carry out this drilling and supply would fall to the developer and not the Council.

12.9 Whilst geothermal energy is a well established industry elsewhere, it is currently under-developed in the UK with only one project currently active, in Southampton. Further information on the Southampton scheme can be found at http://www.southampton.gov.uk/s-environment/energy/Geothermal/. Whilst an innovative scheme in the 1980s, the Southampton project was on a much smaller scale to the proposed scheme in Crewe, with drilling only going to 1500m.There is recognition in government and across the industry that the lack of schemes more recently is due to the high level of financial risk involved and due to the lack of a flagship project to prove the viability of the resource here in the UK. Public sector intervention is, therefore, needed to act as a catalyst to the development of the industry.

12.10 The potential development of the land at Leighton West as a geothermal energy centre could form a key part of the Council's wider regeneration in Crewe under the All Change for Crewe Programme. It is an aspiration, based on experiences at similar sites worldwide, that development at the site could directly create in the region of 60 new jobs and this number could multiply linearly as more sites are developed. In Germany, the equivalent industry has created 9000 new jobs in 10 years.

12.11 It is an aspiration of the Council that the creation of such a new industry, which is novel within the UK market, will also help to diversify and strengthen Crewe's employment base, offering a new sector for Crewe's workforce to expand in to and be employed by, making Crewe more robust against future manufacturing contraction or other economic shocks.

12.12 Following analysis of similar projects worldwide, it is possible that the project will also make a significant contribution to reducing carbon emissions in Cheshire East, particularly from industrial and residential heating. It is an aspiration of the Council that the project could save up to 8000 tonnes of carbon every year.

12.13 Potential routes for delivery which have been appraised are a lease model and a joint venture model. Under the Joint Venture Model the

Council would enter into Joint Venture Agreements with a drilling provider to release geothermal energy, and an energy company to provide the utility supply to end users. An appraisal of the different options can be found at Appendix 2.

12.14 As part of the £96k funding requested, external expertise will be commissioned to carry out a detailed viability study (legal, procurement and financial) of identified delivery options, in order to identify the best way forward for the Council. This viability study will carry out a full site investigation and also assess whether any planning constraints on the site might affect delivery.

12.15 A site investigation is key as whilst it is acknowledged that if the site is leased, with the responsibility for obtaining planning permission transferred to the developer, the landowner could still have responsibilities for such matters as legal agreements tied to the grant of planning permission which also need to be taken into account.

12.16 The project business case has passed through the Council's project management system and has been supported by both TEG (30th May 2013) and EMB (21st June 2013).

13.0 Access to Information

The background papers relating to this report can be inspected by contacting the report writer:

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