

The background of the slide features a large, light blue watermark of the City of Grangemouth coat of arms. The coat of arms is a shield divided into four quarters. The top-left quarter shows a saltire (X-shaped cross) on a blue field. The top-right quarter shows a stag's head facing left on a red field. The bottom-left quarter shows a three-masted sailing ship on a blue field. The bottom-right quarter shows a crowned eagle with wings spread on a red field. Above the shield is a crown with four fleurs-de-lis. A scroll at the bottom contains the motto 'AINE FOR A'.

Agenda Item 15

Grangemouth Energy Project Update

Falkirk Council

Title: Grangemouth Energy Project Update

Meeting: Executive

Date: 21 March 2017

Submitted By: Director of Development Services

1. Purpose of Report

- 1.1 The purpose of this report is to provide an update on the progress of the Grangemouth Energy project including the results of recent business case work and to recommend next steps.

2. Recommendation(s)

2.1 The Executive is asked to:-

- (1) note the updated position of the Grangemouth Energy Project development work**
- (2) agree the inclusion of the next stage of the Energy Project work within the proposed Investment Zone initiative**
- (3) agree to investigate the potential use of the Council's purchasing powers for low carbon energy supplies as a means of enabling delivery of a district heating network the area**

3. Background

- 3.1 The situation concerning the potential closure at the Ineos site in Grangemouth highlighted concerns amongst the area's business community over the cost and stability of energy to sustain their operations. These concerns were highlighted to Government Ministers and Council representatives at the time and it was agreed to investigate this situation further. The Scottish Government's heat mapping exercise had identified Grangemouth as the largest concentration of industrial heat in Scotland, with significant associated carbon emissions. The recent draft Scottish Energy Strategy highlights that district heating networks, where possible using industrial heat, can help deliver a lower carbon future for Scotland, in turn helping to deliver on national emissions reduction targets.
- 3.2 In March 2016 the Council's Executive received an update on the work that had been undertaken involving Scottish Government, Scottish Enterprise and other bodies to examine the potential of district heating in and around Grangemouth. This work had suggested that district heating schemes are potentially viable in this location. It had identified a series of networks in the Eastern and Western sections around this area that were worthy of further examination.

The areas examined are shown on the attached map (Appendix 1), extracted from the March 2016 report. The Council agreed to examine the prospects for this further by progressing with work on a business case for delivery of an energy project at Grangemouth. This work was to be joint funded by Scottish Government and the EU via its Low Carbon Infrastructure Transition Programme (LCITP). The work sought to assess the opportunity to establish low carbon district heating networks serving a mixture of business, domestic, and public sector buildings within defined areas across Grangemouth and Falkirk. In addition, to learn from experience of similar initiatives across the EU, the Council agreed to join an INTERREG funded project. The work on the business case has now been undertaken and this report summarises the results.

4. Considerations

- 4.1 The Grangemouth area is acknowledged to be a major concentration of energy usage in Scotland and is estimated to emit c4m tonnes of carbon annually. The area faces some significant changes arising from investment in new chemicals and energy sector developments. Several new energy-related investments have been granted consent or are planned at this location including new combined heat and power (CHP) plants at the sites of Calachem (energy from waste), Forth Ports (biomass) and Ineos (gas-fired). The business case on the Grangemouth energy project was commissioned by Scottish Government in liaison with the Council and Scottish Enterprise and was prepared by Atkins, consulting engineers. It took the approach of considering the customers that might connect to a heat network, using these to plan out energy generation sources and potentially viable networks to connect these customers to the district heating system.
- 4.2 From the beginning of this work the availability of industrial heat from a number of local sources was regarded as a significant positive element to the study. The existing or planned energy plants around Grangemouth were considered as potential heat suppliers, however it was noted that the definition of these energy plants as 'renewable' or otherwise, would have an effect on their capacity to attract financial support in the form of initial capital grant or ongoing renewables subsidies. These subsidies can be important to the viability of district heating ventures. Using heat from renewable energy plants would result in lower carbon emissions than from traditional gas-fired generation and would result in significant carbon savings over existing emissions levels. Using heat from gas fired sources would result in more limited carbon savings and is unlikely to attract financial support.
- 4.3 The study suggests that the Council should consider the acquisition of energy for its buildings from the district heating network. This involves that it consider purchasing low carbon energy supplies where these offer benefits to the Council in terms of reductions in cost, carbon emissions as well as ensuring stability of supply.
- 4.4 The Atkins study identified three potential scenarios for consideration with each of these modelled over a 25 year period:

- **Scenario 1:** Full 'day one' build-out across both the Eastern and Western network areas
- **Scenario 2:** Begin with key 'hubs' in parts of the area, developing into the full build out over area during the project's lifespan
- **Scenario 3:** Standalone Eastern and Western schemes

4.5 **Scenario 1:** This scheme anticipates provision of a full district heating network at a cost of £52.7m, serving Eastern and Western networks with full adoption by the businesses, public buildings and residential areas connected. The results indicate that the scheme only shows an economic return when energy use by a major industrial user in the area is included. However including a single large 'anchor' energy user, so critical to a scheme's success, presents a significant risk. If this user were not to participate in the scheme, a significant capital grant (up to £25.8m) would be required to make the £52.7m scheme financially viable. This is notwithstanding the wider socio-economic and carbon reduction benefits that would arise.

4.6 **Scenario 2:** A series of smaller scale district heating network hubs were tested as options to develop the scheme in the short term with capacity to extend these to a fully built-out scheme:

- a) Western Network: extension of the existing Council owned Callendar Park gas-fired CHP scheme.
- b) Western Network: a network around the Falkirk Stadium, including the future Falkirk Gateway loads (when developed).
- c) Eastern Network: a network around the Grangemouth sports facilities (Sports Centre, Stadium), including supply to a major industrial user.

This scenario suggests that, without a major industrial user this scenario is more expensive to complete over the longer term (up to £64m) and would require a capital grant of up to £28.5m. The risks of relying on an anchor industrial user are also present. Amongst the smaller networks considered in this scenario it was suggested that the three schemes be examined further.

4.7 **Scenario 3:** This option considers standalone network options for the Eastern and Western area. The Eastern network option, with heat supply from a renewable power supplier with a major industrial user demonstrates a marginal positive return over 25 years (although with attendant risks from an anchor industrial user). The standalone Western network option, served similarly by a renewable source also shows a marginally positive return over 25 years. The study notes that these options would prove viable if some assurances were available over energy demands from e.g. the Falkirk Gateway development.

- 4.8 The Atkins report does highlight that, for a district heating scheme to be financially viable, it must display a level of density in heat demand of between 2-4MegaWatt hour (MWh) per metre of pipe laid. The heat densities modelled for the proposed networks are below this range for minimum viability on a strictly financial basis, subject to the caveats elsewhere in this report. The report notes that this has been the experience elsewhere in Scotland in areas of similar heat density and in order to proceed with such schemes, an element of grant funding is required to:
- improve the financial viability of the scheme
 - achieve the carbon reduction benefits anticipated, and
 - unlock the socio-economic benefits that such a project would bring
- 4.9 The potential delivery of a district heating network as a means of substantially reducing carbon emissions and offering more sustainable energy solutions continues to retain interest from prospective energy sector investors, Scottish Government and other public bodies. Recent policy documents issued by the Scottish Government reinforce this view. Its potential to attract grant funding for capital investment as well as renewables subsidies to help make the scheme viable requires further examination.
- 4.10 The prospect of the Council using its purchasing powers to obtain lower carbon heat solutions to help prime the development of district heating networks is highlighted in the study. It is suggested that the Council should adopt this approach as a means to help attract investment in these schemes. Approval is sought for the Council to investigate this approach to help deliver a scheme and report back to the Executive at a future meeting.
- 4.11 As reported to the February meeting of the Executive, the Council is working with Scottish Government and other partners via the Falkirk Economic Partnership to examine the prospects for an Investment Zone at Grangemouth and parts of the wider Falkirk Council area. This initiative has regard to the future infrastructure, economic development and low carbon needs of the area. It is intended to encompass work taking place in relation to the delivery of the Falkirk TIF, energy project and related chemicals sector developments. It is suggested that the next stages in development of the Investment Zone should be used to help define a viable district heating network solution for the area, to be taken forward by this route. This work will examine further the potential scenarios outlined above and give recommendations as to how these might be taken forward as part of the Investment Zone proposition.

5. Consultation

- 5.1 Consultation has been carried out with stakeholders including businesses in the Grangemouth area, national energy and economic development agencies and the Falkirk Economic Partnership throughout and the project has been outlined at business engagement events.

6. Implications

Financial

- 6.1 The next stages of this work will be included in the Grangemouth Investment Zone and the financial implications will be set out within the business case.

Resources

- 6.2 Any future project development work would be resourced from within the Grangemouth Investment Zone project.

Legal

- 6.3 There are no immediate legal implications arising from the report recommendations.

Risk

- 6.4 The scale of cost of any district heating network carries inherent risk, with the full build-out option approaching £53m to implement for Scenario 1; and up to £63.9m for Scenario 2. Access to public sector grant support and renewables subsidies is likely to be necessary for delivery and detailed feasibility work would be required to prove the viability of any scheme. Agreements with industrial users would require assurances over the long-term commitments required to supply heat. Were it minded to proceed, there is a risk to Falkirk Council in operating as a heat or energy provider in the event of any service disruption and due risk mitigation, resilience and back-up arrangements would be required. A full risk matrix will be maintained for any future project elements.

Equalities

- 6.5 An equality and poverty impact assessment was not required but will be carried out on projects that proceed to implementation.

Sustainability/Environmental Impact

- 6.6 Delivery of a district heating network is acknowledged to offer substantial environmental benefits in reduced carbon emissions. A sustainability assessment was not completed as part of compiling the report but will be carried out on projects that proceed to implementation.

7. Conclusions

- 7.1 The work to examine the potential delivery of a district heating network at Grangemouth highlights that it has the potential to help reduce carbon emissions and enhance energy provision. However it needs substantial investment (up to £63m) to proceed. It may only prove viable with agreements for energy supply being established with major industrial users or with commitment of public subsidy in capital grants and ongoing renewables subsidy.

- 7.2 The development of the area wide network as identified in Scenario 1 above will be included in the project list submitted as part of the business case development process for the Grangemouth Investment Zone agreed at the February Executive. This is with a view to seeking funding through the Investment Zone to augment the meet the requirements of the business case. Other approaches to development of district heating, including use of the Council's energy purchasing capacity will be pursued during this next phase of work and it is suggested that the results of this be the subject of a future report to the Council.

Director of Development Services

Author – Matthew Farrell, Economic Development Officer 01324 590988,
matthew.farrell@falkirk.gov.uk

- Douglas Duff, Head of Economic Development & Environmental Services
01324 504952, douglas.duff@falkirk.gov.uk

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Appendices

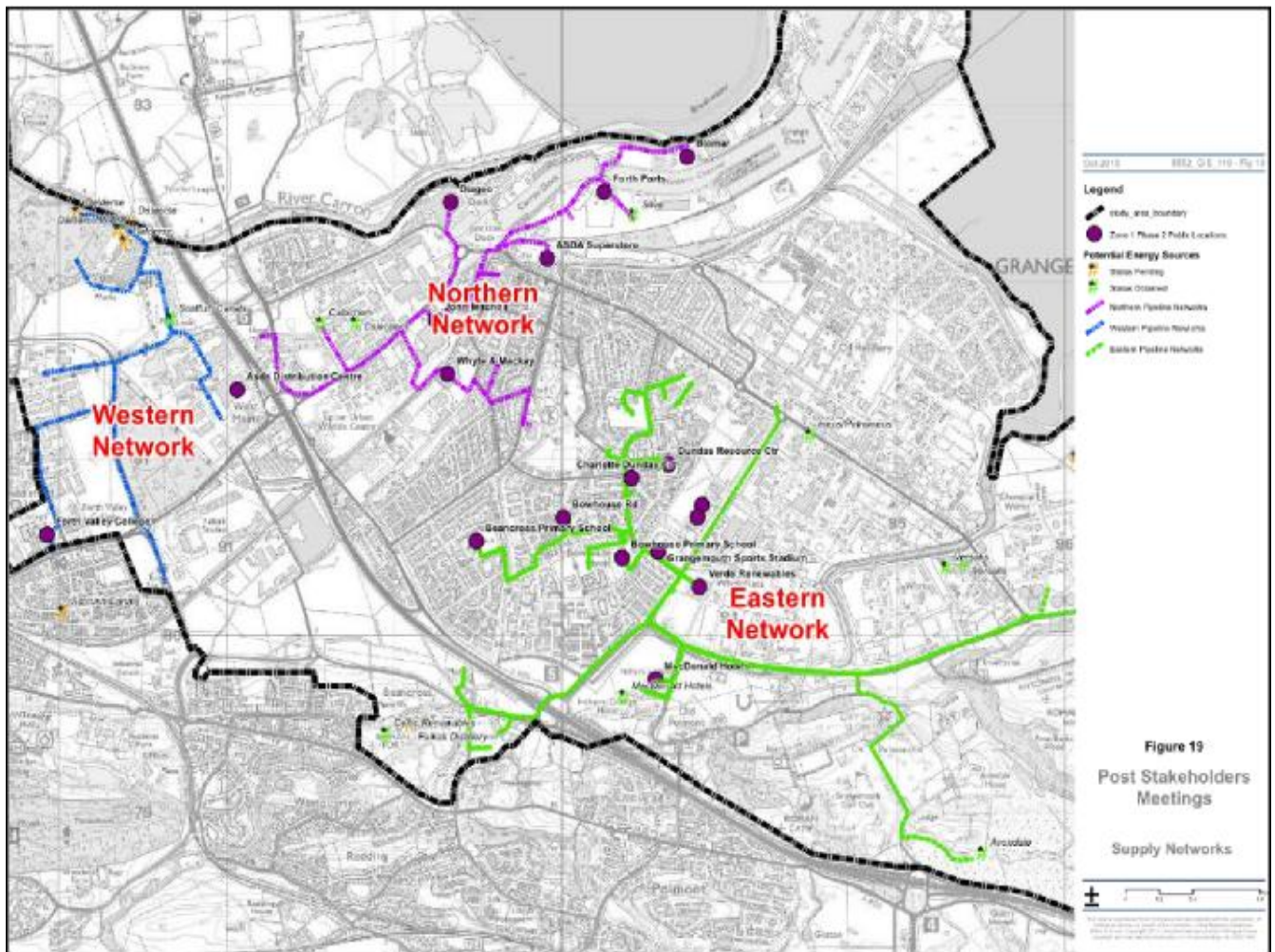
Appendix 1– Grangemouth Energy Project - District Heating Network Areas

List of Background Papers:

The following papers were relied on in the preparation of this report in terms of the Local Government (Scotland) Act 1973:

- Grangemouth Energy Project – District Heating Report – Atkins 2016

Appendix 1 – Grangemouth Energy Project - District Heating Network Areas



(Extract from Grangemouth Energy Project Summary Report – MACE, December 2015)