

<b>Meeting of:</b>	<b>SUBJECT OVERVIEW &amp; SCRUTINY COMMITTEE 1</b>
<b>Date of Meeting:</b>	<b>22<sup>ND</sup> APRIL 2024</b>
<b>Report Title:</b>	<b>CAERAU HEAT SCHEME</b>
<b>Report Owner / Corporate Director:</b>	<b>CORPORATE DIRECTOR, COMMUNITIES</b>
<b>Responsible Officer:</b>	<b>GROUP MANAGER ECONOMY, NATURAL RESOURCES &amp; SUSTAINABILITY</b>
<b>Policy Framework and Procedure Rules:</b>	<b>There are no implications for policy framework or procedure rules, resulting from this report.</b>
<b>Executive Summary:</b>	<b>This report describes the activity undertaken as part of the ERDF funded Caerau Heat Scheme now that the project has closed.</b>

## **1. Purpose of Report**

- 1.1 The purpose of this report is to update the Subject Overview and Scrutiny Committee 3 on the Caerau Heat Scheme now that the project has closed.

## **2. Background**

- 2.1 The Caerau Heat Scheme was established as a highly innovative project that proposed to extract heat from water contained within flooded former coal mine workings, to provide a resource for properties within Caerau. The water in the closed district heating water circuit would be transported via a network of pipes to the properties with the temperature being boosted to the residents required level by a ground source heat pump.
- 2.2 The innovative nature of the project presented multiple challenges as feasibility, testing and exploratory works and studies were undertaken, most notably how to commercially use mine water as a resource, how to secure customers to a heat network, how to create a commercially affordable and viable project and how to deliver within strict timelines set in place by the funder.
- 2.3 A master planning exercise was completed in early 2016 which considered opportunities for heat schemes in the Upper Llynfi Valley area (area covered from Garth in the south to Caerau in the north) and the report concluded that the most suitable opportunity existed in Caerau which had potential to exploit mine water as a resource.

- 2.4 A feasibility study was commissioned in September 2016, with a consortium led by Cardiff University procured for delivery. The study was completed in January 2018 with the results encouraging for the project. The former colliery workings have been accessed through the geo-technical site investigation with the indications being that they are full of water with a temperature of 20.6°C.
- 2.5 In June 2021, a report was taken to Cabinet detailing options for taking forward the Caerau Heat Scheme. The decision taken by Cabinet was to progress with a blended option of a mine water scheme, serving Caerau Primary School, and a heat network with an alternative heat source serving homes with a private wire electricity connection from the nearby wind farm.
- 2.6 Work undertaken following the June 2021 report identified challenges such as domestic customer sign up to the heat network, meeting the project delivery target date of June 2023 and the delivery of a financially viable project.
- 2.7 Following this, in October 2021 Cabinet resolved to remove the Tudor Estate heat network element of the project and that focus should be a mine water example project with a private wire arrangement from the wind farm providing a lower cost supply of electricity to the heat pump at Caerau Primary School.
- 2.8 The project consultant team indicated that a 'go live' date for procurement of January/February 2022 was required to deliver a scheme as outlined in October 2021. However, challenges arose in relation to securing the land required to deliver the scheme.
- 2.9 The Welsh European Funding Office (WEFO) deadline of June 2023 for completion of the construction of a community renewable energy scheme was therefore not considered achievable.
- 2.10 The project set out to deliver two key outputs:
- the construction of a community renewable energy scheme
  - the delivery of a pilot project
- 2.11 With the delivery of a constructed community renewable energy scheme no longer considered viable, officers focused on the remaining output, the delivery of a pilot project.
- 2.12 It was considered that any attempt to further revise the project with the aim of delivering against both the constructed community renewable energy scheme and pilot indications would present significant risks to Bridgend County Borough Council (BCBC). In particular the business modelling presented significant challenges as to the ongoing financial model and the limited timescales in which to deliver a capital scheme, would lead to a significant likelihood of activity running past the latest possible end date of the project of June 2023. This would have presented financial risk to BCBC in relation to claw back of grant or incurred costs being deemed ineligible.
- 2.13 However, focussing on the delivery of the pilot project, whilst it did not complete on all original outputs, provided a way to deliver benefits from the scheme. The Caerau Heat Scheme was a unique project for the UK, testing a concept. It was considered

that this option would allow for a more detailed lessons learnt approach as a purely desktop project that did not involve any construction activity and provided a positive outcome from the project.

- 2.14 A re-profiled proposal was submitted to WEFO in September 2022 which proposed that a 'Mine Water Heat Toolkit' be produced to capture the lessons learned from the funded activity and present it in an online resource to support others in developing mine water heat schemes.
- 2.15 A significant level of work was carried out throughout the project delivery including the drilling of a borehole to more than 200m and an extensive engagement with the local community and external stakeholders. As an innovative pilot project much has been learned from this funded activity which will be of value to other projects that aim to use heat from mine workings. Dissemination of this resource is through key strategic partners including Welsh Government, Regional Bodies, and the Coal Authority.

### 3. Current situation / proposal

- 3.1 The project has been completed and the deliverable of the Minewater Heat Toolkit has been created by the consultant and is available on the BCBC website <https://www.bridgend.gov.uk/residents/nature-climate-and-environment/caerau-heat-scheme/>. It is arranged in the following modules:

- Mine Energy and Heat Networks
- Geology and Hydrology
- Commercial Modelling
- Stakeholder Management
- Community Engagement
- Licensing and Permissions
- Boreholes and Drilling
- Private wire connection and case study
- Procurement
- Project Management and Governance
- Template techno economic model (MS Excel workbook)
- Template high level project plan
- Interactive mine water resource model <https://www.nordic.energy/interactive-map/>
- Reference library
- Appendices

Each module provides context for the specific topic and recommends how to approach it as part of a new project, based on learning from the Caerau Heat Scheme. It is presented using accessible language and is intended to support early-stage planning by non-technical users, such as local authority officers. The template techno economic model provides a practical and comprehensive tool to begin to understand the potential economic performance of a scheme to help the creation of an initial business case without significant external input.

- 3.2 The toolkit has subsequently been evaluated by an external evaluator who made the following recommendations:
- It would be beneficial if a less-contractual remedy were put in place between BCBC and Nordic Energy that requires the correction of errors or omissions, even after the toolkit has been launched.
  - The mine water toolkit should be reviewed periodically, perhaps every 6 or 12 months to enable new information to be referenced and signposted.
  - Funding should be sought to enable the toolkit to be periodically reviewed and altered in the event of changing guidance or other factors necessitating models to be updated. This could be delivered either:
    - By a consultancy organisation.
    - By BCBC internal staff if the skills are available.
  - Consideration should be given to the inclusion of interviews with report authors, stakeholders and individuals involved in the Caerau Heat Scheme.
  - This toolkit should reference and be referenced by other similar resources that have been developed (or are being developed), e.g. Public Sector Decarbonisation Guidance hosted on the Energy Systems Catapult website, relevant places on the website for The Coal Authority, UK government websites such as the Heat Networks Delivery Unit guidance pages.
- 3.3 Two workshops have been held to review the project and to compile a list of the lessons learned. The workshops captured the experiences, what went well and what did not, from the personnel involved in the project, and the lessons learned were written up in a brief report.
- 3.4 The work included gaining some consensus of the group as to which of the lessons learned they considered to be the most important. The top three lessons were as follows:
- Ensure that the project is within the role of the organisation and aligned to the aims of the organisation.
  - Greater agility to deal with project scope changes is needed.
  - Decisions need to be made in appropriate timescales and a lack of decision is sometimes worse than the wrong decision.
- 3.5 These three lessons learned suggested the following actions should be taken to implement the lessons:
- Define the project types that will be promoted by BCBC.
  - Define the project method for each project type.
  - Adjust and/or set up processes to meet the requirements of the project methodologies.
  - The impact or risk of not making the decision will be balanced against the impact or risk of making the wrong decision.

#### **4. Equality implications (including Socio-economic Duty and Welsh Language)**

- 4.1 The protected characteristics identified within the Equality Act, Socio-economic Duty and the impact on the use of the Welsh Language have been considered in the preparation of this report. As a public body in Wales the Council must consider the impact of strategic decisions, such as the development or the review of policies, strategies, services and functions. It is considered that there will be no significant or unacceptable equality impacts as a result of this report.

#### **5. Well-being of Future Generations implications and connection to Corporate Well-being Objectives**

- 5.1 The Well-being of Future Generations (Wales) Act 2015 Assessment based on the 5 ways of working and any requisite mitigating measures have been set out below: -

The Caerau Heat Scheme demonstrates the sustainable development principle by ensuring that by meeting the needs of the present they do not compromise the ability of future generations to meet their own needs. This is evidenced through the 5 ways of working as follows:

- **Long Term:** The project set out to provide a key opportunity to deliver a decarbonised heat system that supports efforts, through an innovation project, to meet the UK decarbonisation targets. The outputs from the scheme will support such action in the future.
- **Prevention:** The project provides an opportunity to test and learn from the concept of mine water as a heat resource and the proposed toolkit will inform future potential heat projects.
- **Integration:** The toolkit will support future proposals aimed at carbon reductions.
- **Collaboration:** BCBC is working with both UK Government and Welsh Government as well as private sector partners to deliver the decarbonisation agenda.
- **Involvement:** The project involves working with a variety of stakeholders to deliver future sustainable solutions around holistic decarbonisation.

#### **6. Climate Change Implications**

- 6.1 Decarbonising heat poses a significant challenge. Heat networks using geothermal heat sources, including mine water, present an opportunity to generate low carbon heat for domestic and non-domestic users. As such, the toolkit could assist in the development of such schemes which will contribute to reducing emissions associated with the heating of buildings.

#### **7. Safeguarding and Corporate Parent Implications**

- 7.1 There are no safeguarding or corporate parent implications arising from this report.

## 8. Financial Implications

- 8.1 The total eligible cost of the scheme approved by the Welsh European Funding Office (WEFO) was £2,995,864, against which ERDF grant has been received of £1,072,118. The total eligible cost was funded as follows:

<b>Source</b>	<b>Value £</b>
ERDF grant	1,072,118
Welsh Government grant	1,414,414
BCBC staff match funding	302,551
BCBC contribution	65,176
DECC/BEIS	76,652
Scottish Power	64,953
<b>TOTAL</b>	<b>2,995,864</b>

## 9. Recommendations

- 9.1 It is recommended that the Committee notes the content of this report and provide comments on the way forward outlined in the report.

### Background documents