



**RHONDDA CYNON TAF COUNTY BOROUGH COUNCIL**

**CLIMATE CHANGE CABINET SUB-COMMITTEE**

**6<sup>th</sup> DECEMBER 2022**

**HYDRO ELECTRIC GENERATION AT TREFOREST WEIR**

**REPORT OF THE DIRECTOR OF CORPORATE ESTATES IN DISCUSSION  
WITH THE CABINET MEMBER FOR CLIMATE CHANGE & CORPORATE  
SERVICES**

**Author(s): David Powell, Director of Corporate Estates and Anthony  
Roberts, Head of Energy & Carbon Reduction.**

**1. PURPOSE OF THE REPORT**

- 1.1. The purpose of the report is to provide an overview of feasibility work completed for the development of a low-head Hydro Electric Scheme at Treforest Weir on the River Taff, Treforest, Pontypridd. This report is based on a preliminary feasibility report produced by a specialist company that reviews the hydropower options at Treforest Weir.

**2. RECOMMENDATIONS**

It is recommended that Members:

- 2.1. Note the contents of this report as part of the works agenda of the Climate Change Cabinet Sub-Committee and agree a way forward.
- 2.2. Agree further expenditure in the development of the proposals, as detailed in section 10.3, to undertake further design studies to assess full potential and develop detailed project proposals.
- 2.3. Consent to receive further progress reports, at appropriate intervals, in the development of the proposals.

### **3. REASONS FOR RECOMMENDATIONS**

- 3.1 Agreeing to take this project forward to the next stage has the potential to make a positive contribution towards the Council's efforts to increase its renewable energy generation across its estate, and in turn, offset our Carbon Footprint in contribution towards achieving our carbon reduction targets.

### **4. PROJECT BACKGROUND**

- 4.1 The content of this report provides supporting information for the development of a hydroelectric scheme at Treforest Weir, which was requested by the Climate Change Cabinet Steering Group, at a meeting in 2021.
- 4.2 In RCT's Corporate Plan 2020-24, 'Making A Difference', the Council acknowledged that delivering on our Climate Change commitment is our greatest challenge. In our plan we committed to delivering priorities, all of which will contribute to and benefit from tackling climate change.
- 4.3 Officers have previously reported on the ongoing work to investigate the potential for the development of renewable energy utilising hydroelectric power. These are projects which would be developed by the Council and as such would both contribute to the increase in the renewable energy provision and carbon reduction in the area, thus contributing positively to the Climate Change Agenda.
- 4.4 To achieve the target of net zero, the Council must invest in the development of clean energy generation projects that enable the Council to decarbonize its assets across its estate. In the development of a carbon neutral building energy model(s), solutions may be duplicated to form part of the Net Zero strategy, and with grid constraints becoming an issue in the region, the generation of renewable energy, in this case utilizing hydro power, will assist with introducing potential innovation opportunities across the County Borough.
- 4.5 TLS Renewable Consulting Ltd have produced a preliminary feasibility report, on behalf of Rhondda Cynon Taf County Borough Council. The brief was to review the potential for installing a 'low-head' hydroelectric generating system at Treforest Weir on the River Taff, making use of the fall in height at the former industrial feeder weir. The exercise is essentially an update of work previously undertaken by Mann Power Consulting Ltd in 2011, which explored using twin Archimedean hydropower screws.
- 4.6 Treforest Weir lies approximately 100m south of the footbridge over the River Taff in the centre of Treforest (see Appendix 'A'). The weir is circa ~50m long, a curved sharp-crested structure with a drop of around 3m between the upper and lower water levels (see Appendix 'B'). The potential scheme is considered a "low-head" hydropower system, where the usable fall in height is no more than 3 meters.

## **5. CURRENT PROJECT SITUATION**

5.1 The TLS report details introductory information on:

- Hydrological assessment
- Cost/benefit analysis estimates
- Turbine technology review
- Site location
- Licensing and Planning including NRW licensing and permitting, abstraction license, fish pass approval, works-in-river consent/ flood risk and planning permission.
- Environmental considerations
- Electricity Connection
- Operational Costs
- Income
- Note on Grant Funding
- Recommendations

5.2 In summary, the report estimates that a hydroelectric, in these circumstances, would produce a max power output of around 400 kW. This would result in an annual saving of 395 tonnes of Carbon dioxide and could generate a total annual income in the region of £250k (if exported to the grid). It is expected that the simple payback period (based on export only) will be under 20 years, representing a fair return on investment in today's market, however the exact payback period is yet to be established and will depend on how, when and where we are able use, the energy generated.

## **6. PROJECT FORWARD PLANNING**

6.1 Looking forward, a topographical survey of key areas, and a formal civil engineering survey, will be required, together with an assessment of electrical output infrastructure costings. These future inputs will be required to produce accurate project elemental costings, which will formulate a detailed budget (the costs presented in the preliminary feasibility report are high level only and merely establish initial viability data, to take to the next stage).

6.2 In addition to the above, further investigation and appraisal will be needed to determine the best option for use of the energy generated, including an assessment into the viability of an array of possible private wire arrangements within the vicinity of the site, as an addition to or as an alternative to, an export arrangement to the National Grid.

6.3 Further work will also be required to confirm and update the original estimates and assumptions in the preliminary feasibility report, when set in the context of the additional information above.

6.4 A timeline will need to be established to allow for the process of obtaining a license from NRW (refer to Section 10), approval from CADW and to assess a realistic timeline in procuring all the necessary equipment, in today's market conditions.

## **7. EQUALITY AND DIVERSITY IMPLICATIONS / SOCIO-ECONOMIC DUTY**

7.1 This report is for the purpose of providing an update and consequently an Equality Impact Assessment is not required.

## **8. WELSH LANGUAGE IMPLICATIONS**

- 8.1 This report is for the purpose of providing an update and consequently a Welsh Language Impact Assessment is not required, however a copy can be made available in Welsh if requested.

## **9. CONSULTATION**

- 9.1 There are no consultation requirements at present with regards to this supporting report. However, should the project proceed to the next phase of development, appropriate consultations will take place as part of the necessary planning approval process.

## **10. FINANCIAL IMPLICATION(S)**

- 10.1. To consider the development of a hydroelectric scheme at Treforest Weir in greater detail, an in-depth design and cost study will have to be undertaken. by a specialist company, which would include a design study and a cost benefit analysis.
- 10.2. Further investigative works will need to be undertaken, as referred to and listed in section 6 above.
- 10.3. The total budget likely to be required to take the project to the next stage, will be in the region of £40,000, and this level of expenditure can be covered from within existing budgets for such works.
- 10.4. Should the project progress to the detailed design stage then there will be further funding issues to consider at that stage, regarding the appointment of specialist advisers/designers. At present we would estimate the cost of these further requirements to be in the region of £65,000, however this will need to be assessed and reviewed at the appropriate time/stage of proceedings, once other studies above have been completed.

## **11. LEGAL IMPLICATIONS**

- 11.1 Natural Resources Wales (NRW) regulates many aspects of environmental protection and is particularly involved in the protection of inland waters. NRW recognises that hydropower proposals will need to be considered by several NRW teams and will require several different permits. While these may have statutory deadlines, NRW now expects most of the discussion process to take place within a pre-application period which is subject to no formal time limit. Once the formal application is submitted, there is a statutory period of up to 4 months for determining this, though this limit is often extended or exceeded in complex cases.
- 11.2 The site is a series of Grade II listed\* buildings, and as these structures are of 'special interest' every effort must be made to preserve them. Changes to listed buildings are managed through listed building consent, which is part of the planning system. Listing is not a preservation order, but it is intended to help manage change and protect the buildings, the settings and features from unsympathetic works that could damage its special interest.

**12. LINKS TO THE CORPORATE AND NATIONAL PRIORITIES AND THE WELL- BEING OF FUTURE GENERATIONS ACT.**

- 12.1. All actions that may arise resulting from the recommendations of the Climate Change Cabinet Sub Committee report, will take full regard to the seven National Wellbeing Goals.

**13. CONCLUSION**

- 13.1. This report provides an overview of the preliminary feasibility review of hydropower options at Treforest Weir. It is recommended that the Climate Change Cabinet Sub-Committee approve the necessary funding to enable the Council to appoint industry specialists, to assist its Officers to move forward with the additional investigations required to help develop this proposal into a full and viable project.

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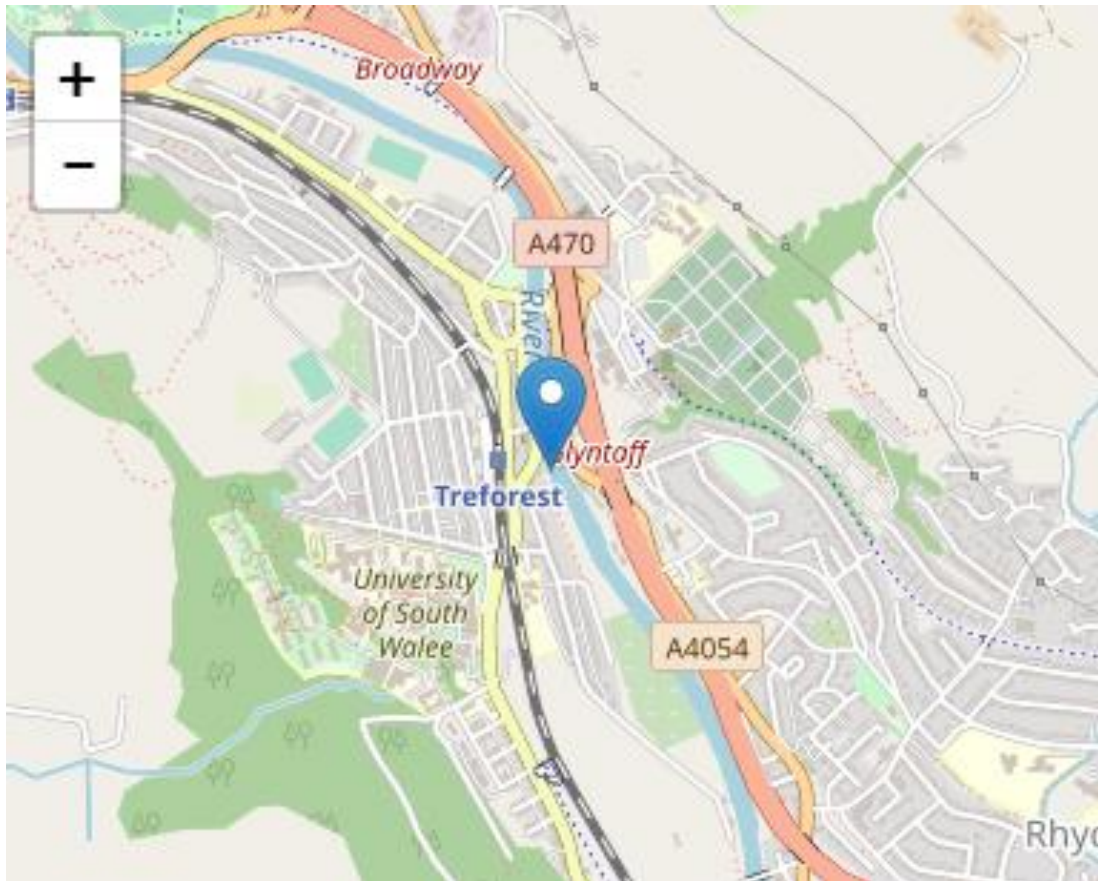
**Appendices to follow on next page:**

**Appendix A   -   Fig' 01 - Location of Weir**

**Appendix B   -   Fig' 02 - Illustration as it stands**

**Appendix A**

Fig' 01 – Location of Weir



**Appendix B**

Fig' 02 – Illustration as it stands

