

Eco Bicester Strategic Delivery Board

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Report title: Ardley Energy from Waste (EfW) - Combined Heat and Power (CHP)	
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1. Background

- 1.1 Planning permission has been allowed on appeal and Oxfordshire County Council has given a resolution to grant planning permission for an Energy from Waste facility to be built and operated by Viridor, on land adjacent to the existing landfill site at Ardley. The decision of the Secretary of State to allow the appeal is subject to judicial review.
- 1.2 The Energy from Waste facility has been designed to annually burn up to 300,000 tonnes of residual household, commercial and industrial waste. It will have the potential to generate approximately 26MW of electricity (enough for to serve around 25,000 people). It will also be designed to enable the export of low grade heat to nearby end users. The facility was proposed to be fully operational by 2014.

2. Combined Heat and Power (CHP)

- 2.1 CHP means generating power in the form of electricity and at the same time utilising the heat generated which would otherwise be wasted e.g. heating homes, businesses and public buildings via a district heating scheme.
- 2.2 Most EfW plants of the type proposed for Ardley have traditionally produced electricity by raising steam (heating water) from the incineration process, with the lower grade heat going unused (discharged to atmosphere) after the electricity has been generated. Often this is due to the lack of a suitable end user of the heat within close proximity and prohibitive costs involved in laying the necessary infrastructure.
- 2.3 This is a waste of increasingly valuable heat. By capturing and using this heat the thermal efficiency of the process can rise significantly from about 20-25% without heat recovery; to 80% with heat recovery and use (80% of the calorific value of the fuel being used).

3. Benefits

- 3.1 As well as the more efficient use of waste as a resource there are a number of other benefits of CHP:

Environmental

- Replacing the need to burn other fossil fuels to generate the heat. There are potentially big savings to be had. In Sheffield 2800 homes and 140 commercial and municipal buildings are heated via a CHP scheme. Up to 60MW of heat and 20 MW of electricity is generated, reducing CO2 emissions by an average of 21 000 tonnes per year.

- Once a district heating network is established it can quickly grow. The availability of attractively priced heat encourages others to connect and the network to grow so increasing the benefits. The financial incentives will play an important role as will the planning process highlighting and encouraging commerce with significant heating/cooling demand to locate in a particular location.
- Reduction of CO2 emissions (up to 30%) by producing renewable energy from non-fossil fuels. This will help achieve the Governments carbon reduction targets.

Financial

- Additional income to the provider of the heat. Users of the heat pay a standing charge and then are metered based on use.
- Potential significant cost saving to the user compared with heating via more conventional means. This will help deliver the fuel poverty improvements as the cost of heating becomes disconnected to the fluctuation in commodity prices. It can also reduce the heating / cooling costs for business and public buildings as well as helping them reduce the carbon footprints.
- There are a number of financial drivers helping to incentivise the use of CHP e.g. availability of Renewables Obligation Certificates (ROCs), Climate Change levy exempt and the soon to be announced Renewable Heat Initiative. The latter is a significant initiative supporting CHP with the specific aim of making a significant increase in the number of schemes. This scheme will work by providing financial support to the heat provider, who will be paid the difference if the cost of providing heat proves more expensive than that of conventional heating.
- Capital savings as you only need to provide the boiler infrastructure once rather than every building needing a boiler

4. Key considerations

- Need to have sufficient base load – constant demand for heating / cooling from a range of users e.g. leisure facilities, hotels, commercial, schools, hospitals, colleges, industrial as well as flats and houses
- Potential to use the planning process to promote and expand the network by attracting industry / commerce and others with significant heating cooling demand
- New build developments rather than retrofitting is significantly more cost effective
- Back up generation required in case of emergency shut down of the EfW plant
- Proposed eco-town is 2.7km from the EfW plant. Well within range to enable the transfer of heat
- Legal requirement for the EfW operator to fully evaluate the viability of CHP
- Implications for the site layout and uses
- Potential comparison with other renewable energy sources
- Potential to provide wider benefits to Bicester and surrounding villages should be explored.

5. The Planning Permission

- 5.1 The planning permission granted by the planning inspectorate included a number of conditions relevant to this matter. These are set out below;

Prior to commissioning of the EfW plant, a Combined Heat and Power (CHP) Feasibility Review, assessing potential commercial opportunities for the use of heat from the plant, shall

be submitted to and approved by the Waste Planning Authority. The Review shall provide for the ongoing monitoring and full exploration of potential commercial opportunities to use heat from the plant as part of a good quality CHP scheme (as defined in the CHPQA Standard issue 3 January 2009 which sets out the definitions, criteria and methodologies for the operation of the UKs CHP Quality Assurance (CHPQA) programme), or any superseding or amending standard, and for the provision of subsequent reviews of such commercial opportunities as necessary.

No waste shall be burnt in the EfW plant until the electric cable link from the Plant to the National Electricity Grid has been constructed and is capable of transmitting all the electrical power produced by the Plant. Thereafter, except during periods of maintenance and repair and unless required to do so by the National Grid no waste shall be processed by the plant unless power is being generated.

No development shall take place until a local liaison panel has been established in accordance with details to be submitted to and approved in writing by the waste planning authority. The details shall include terms of reference and frequency of meetings of the panel. The panel shall meet in accordance with the approved details.

If for any reason other than for extended maintenance or repair, the EfW facility ceases to be used for a period of more than 36 months, a scheme for the demolition and removal of the building and the related infrastructure (which shall include all buildings, structures, plant, equipment, areas of hardstanding and access roads) shall be submitted for approval in writing to the Council. Such a scheme shall include:

- (i) details of all structures and buildings which are to be demolished;*
- (ii) details of the means of removal of materials resulting from the demolition and methods for the control of dust and noise;*
- (iii) timing and phasing of the demolition and removal;*
- (iv) details of the restoration works; and*
- (v) the phasing of restoration works.*

The demolition and removal of the building and the related infrastructure and subsequent restoration of the site shall thereafter be implemented in accordance with the approved scheme.

6. Conclusion

- 6.1 As the decision that has been taken to allow the incinerator at Ardley is subject to a judicial review there is no certainty that the incinerator will go ahead or the timescales for its provision will be adhered to. Should it go ahead it would be sensible to explore whether there may be advantages in the use of waste heat from the incinerator for the new development and the development at NW Bicester is the most likely to be able to take advantage.
- 6.2 If the planning permission stands for the incinerator, it requires that a combined heat and power review is undertaken by the operator prior to commissioning the facility and the Eco Bicester project team has also encouraged P3Eco to consider the potential of waste heat from Ardley in putting together energy proposals for the master plan area.
- 6.3 However this should not be looked at as an exclusive option as not only is there remaining uncertainty at present over its provision but there may be other energy solutions that may deliver other benefits or advantages. For example early work carried out by Halcrow identified

potential advantages in using anaerobic digestion as it also had the potential to deal with sewerage from the site

7. Recommendation

1. That Oxfordshire County Council as Waste Authority are asked to share the details of any *Combined Heat and Power (CHP) Feasibility Review* they receive with the Eco Bicester Project so that the Project Team can ensure that opportunities relating to the Eco Town are explored.
2. That P3Eco are asked to undertake a thorough options appraisal for the potential renewable energy sources for the masterplan site and that this be made available to inform further masterplan work