

## Chapter Four

# SITE SELECTION, ALTERNATIVES AND SCHEME DEFINITION

### INTRODUCTION

4.1 Chapter four of the 2008 ES summarised the process followed by EWL to identify a suitable site for an Enviroparks development and to define the content of the scheme. The chapter began with an explanation of the general operational requirements and the planning and environmental principles and criteria relevant to the locational decision, and then explained the various process and technical options considered by EWL.

4.2 This chapter of the ES supplements chapter four of the 2008 ES by explaining how the development has progressed and evolved since planning permission was granted in 2010. The account includes an explanation of the changing circumstances that necessitated the revised scheme for which planning permission is now sought. For completeness it begins with a summary of the development as approved in 2010.

### SUMMARY OF THE 2010 SCHEME

4.3 The proposed site layout of the Enviroparks development as submitted in 2008 and approved by RCT and BBNPA in 2010 is shown in figure 4.1. The objective of the proposed development was to operate a series of advanced resource management processes in one place so that, together, they can recover as much material and energy as currently possible under closely-controlled environmental conditions. Thus, whereas many waste processing technologies such as incineration combust a large proportion of recyclable material and leave a substantial volume of ash or other material that is typically disposed of to landfill, the Enviroparks concept employs a series of alternative technologies that extract the full recyclable value from the waste stream, and which are capable of leaving only 2.5% of the original material for final disposal to landfill.

4.4 The approved development would do this by:

- sorting the waste materials that arrive at the site efficiently to extract recyclable materials, and preparing the feedstock for further processing. This takes place in what is called a 'fuel preparation area';
- using five technologies in an interlinked manner to process the residual wastes and recover energy resources.

4.5 These five processes currently with planning permission on the site are as follows:

- i). a 'Biomax' separator that extracts oil akin to a biodiesel from organic materials such as waste food and other food industry products.
- ii). anaerobic digestion, in which biomass waste is placed in sealed vessels and warmed and stirred in the absence of oxygen. This process removes most pathogens and odour from the waste and provides a useful energy source in the form of methane gas and a clean water effluent.
- iii). pyrolysis, in which solid organic wastes are converted to a useful fuel gas under high temperatures and in the absence of oxygen.
- iv). a similar gasification process in which any materials are converted to simple gases or an inert, glass-like solid material that can be used as an aggregate in construction.
- v). the liquid and gas-based fuels produced through these processes would then be used to fuel a range of reciprocating engines located in a proposed engine house. Some of this recovered energy would then be used by a high energy user – a manufacturing employer with high energy needs, occupying an industrial unit on the northern part of the Enviroparks site.

4.6 The approved development includes a visitor centre designed to accommodate visiting parties from organisations such as schools and colleges. Buildings on the site were designed to achieve 'excellent' standard under BREEAM – the Building Research Establishment Environmental Assessment Method, in accordance with a condition of the sale of the site to EWL by the Welsh Government.

## IMPLEMENTATION AND EVOLUTION OF THE PROJECT BETWEEN 2010 AND 2016

4.7 Following the discharge of relevant pre-commencement planning conditions and s.106 obligations, construction began in May 2015 on phase I of the Enviroparks development in Hirwaun. Figure 4.1 shows the approved layout of phase I, the principal elements of which comprise Building 3 - identified in the 2010 approved scheme as the Fuel Preparation Area Building and now known as the Fuel Preparation Hall - internal site access roads running across the site from Fifth Avenue to Ninth Avenue and supporting drainage provision. The phase I development is largely complete and has the benefit of an Environmental Permit, but is not operational.

4.8 To support the delivery of its phase I development, Enviroparks submitted applications to RCT and BBNPA in 2015 for non-material amendments to the Fuel Preparation Area Building and Gatehouse designs, all of which were approved and have since been implemented.

## CHANGING CIRCUMSTANCES

4.9 Since the original Enviroparks development was designed almost a decade ago, changing circumstances have prompted a reconsideration of the range of processes that can operate on the site.

### Opening of the Bryn Pica AD plant

4.10 In 2015 an anaerobic digestion plant opened at the Bryn Pica waste site north of Aberdare, 7km to the east of EWL's Hirwaun site. This plant will process up to 22,500 tonnes of food waste annually. It was delivered through a partnership deal between the operator and three of the region's councils – Rhondda Cynon Taf, Newport and Merthyr Tydfil – and is intended to be the hub for food recycling in South Wales.

### Changes in the composition of waste

4.11 The composition of municipal solid waste (MSW) and commercial and industrial waste (C&I) that, under the approved proposals, would have arrived at the site in conventional refuse lorries for sorting, has been transformed through the implementation of source segregation and kerbside recycling. Businesses and households are now required to sort their waste into separate bins, enabling materials such as glass, paper and plastics to be sent for recycling with only limited pre-processing. This compelled EWL to reconsider the nature of the waste materials it can process.

### Contracts for Difference

4.12 Since planning permission was granted for the Enviroparks project in 2010 the UK government initiated Electricity Market Reform (EMR) to incentivise the development of new low carbon electricity generation capacity whilst keeping electricity costs for consumers under control. A significant element of this report has been the introduction of Contracts for Difference (CfD) which have replaced the previous Renewable Obligations Certificates (ROCs) scheme through which renewable energy generation was formerly supported.

4.13 A CfD is a private law contract between a low carbon electricity generator and the Low Carbon Contracts Company, a government-owned company. Under this arrangement, a generator is paid the difference between the 'strike price' – a price for electricity reflecting the cost of investing in a particular low carbon technology – and the 'reference price' – a measure of the average market price for electricity in the market. By these means, CfDs aim to give greater certainty and stability of revenues to electricity generators by reducing their exposure to volatile wholesale prices, whilst protecting consumers from paying for higher support costs when electricity prices are high.

4.14 Low carbon energy generators bid for CfDs in auctions held by the UK government. EWL bid for a contract in the first auction. On 26 February 2015 the government announced that Enviroparks has been awarded a CfD for the generation of electricity through 'advanced conversion technologies' – defined as the generation of electricity from fuel from gasification and pyrolysis of biomass or waste. Advanced conversion technologies are at the heart of the Enviroparks development approved in 2010.

### Evolving technical specifications

4.15 With a CfD in place, EWL moved quickly to progress with the implementation of its project. Whereas the 2008 planning applications and ES reflected understanding of the generic technical specification of advanced conversion technologies at the time, implementation of the scheme demands detailed consideration of how specific items of processing plant and machinery can be best accommodated on the site. Implementation also demands consideration of the physical requirements for ensuring that operations can secure and comply with the terms of an Environmental Permit for the site.

### Changing circumstances - implications

4.16 EWL was compelled to balance all of these changing circumstances in determining how development should best proceed. The current planning applications to RCT and BBNPA reflect the outcome of this review process, with a clear focus on advanced conversion technologies and the deletion of the AD and Biomax components of the overall scheme, for the reasons given above. Whereas odour from the AD and Biomax plants would have been controlled comprehensively in accordance with the anticipated conditions of an Environmental Permit, it is noteworthy nonetheless that AD and Biomax would have been amongst the most odorous processes on the site, so their deletion from the scheme might be viewed as advantageous.

4.17 The further implication of the CfD award for advanced conversion technologies and EWL's decision not to proceed with the AD and Biomax processes is that the overall layout of the development needed to be reviewed in order to ensure an optimal operational layout and an efficient use of land across the site. The remainder of this chapter explains how the site layout and design have evolved in the light of these considerations, taking as its starting point the 2010-approved scheme as its baseline.

## ALTERNATIVE LAYOUTS

### Scheme amendments

4.18 As explained, the award of a CfD prompted Enviroparks to engage with specific equipment suppliers to enable the implementation of the second and main phase of the development. Arising from this was a clear picture of the proportions of the plant and machinery required for fuel preparation, gasification and heat and power generation and the associated accommodation requirements.

4.19 EWL's first response to this clarification was to seek to accommodate all of this process equipment within the buildings for which planning permission was secured in 2010. To this end, EWL applied to RCT and BBNPA in 2015 for the variation of planning conditions to enable design amendments to the Pyrolysis Building and Engine House – principally the raising of their roof heights. All of these non-material amendments and variations to planning conditions were approved by the two planning authorities.

4.20 Alongside the amendments described in the preceding paragraph, EWL applied in 2015 for planning permission to enclose the gasifier units that had been shown in an open yard in the south-western area of the site in the 2010 approved proposals. This would have been achieved by extending the approved building on the Fifth Avenue frontage further to the west. Enclosure of the gasifiers would bring a range of operational and environmental amenity benefits including protection from the weather, improved operational working conditions, enhanced noise and odour containment and improved visual appearance. Planning permission was forthcoming in early 2016.

4.21 It was agreed with the planning authorities that none of these scheme amendments was significant such that updates to the 2008 ES were required, although the 2015 planning application for the proposed Gasifier Building was accompanied by an analysis of its landscape and visual effects.

4.22 None of this phase II development has been implemented. Detailed process design identified chronic physical constraints within the buildings as consented. Furthermore, the deletion of the AD and Biomax components of the scheme provided space for a more comprehensive rationalisation of the development layout.

### Scheme review

4.23 EWL thus took the opportunity to undertake a more extensive rethink of how its operations could be accommodated, guided by the following principles.

- The review should work within the general layout, architectural style and landscape strategy for the overall site established by the 2010 planning permissions and implemented in the phase I development.
- The review should have regard to the changed nature of waste inputs to the site and optimise operations around the processing of these waste streams.
- Inputs and outputs to the external environment, including operational road transport, the overall volume of waste imports, electricity generation capacity, air and noise emissions and the potential to export surplus heat to a high energy user located on the north-western part of the site, should not exceed those established in the 2010 planning permission unless clearly justified and should, where feasible and desirable, be reduced.
- All operational processes should be accommodated within buildings. As already noted, this affords a range of operational and environmental amenity benefits including protection from the weather, improved operational working conditions, enhanced noise and odour containment and improved visual appearance.
- Consideration should be given to the potential to consolidate operations within a smaller number of linked buildings, rather than separate buildings as currently consented.
- In view of the previous focus of interest on air emissions from the site, the position of the stack should not vary from that modelled in the 2008 ES and approved in 2010.

4.24 The outputs of this review process may be summarised as follows.

- i). **Waste reception and fuel preparation** – as proposed originally, this activity will take place in the Fuel Preparation Hall now built in the south-eastern part of the site.
  
- ii). **Gasification and energy generation** – In the development approved in 2010, the gasification, pyrolysis and energy generation components of the scheme were located in three adjacent but effectively separate areas of the site, with the gasifiers in an open yard. Improvements in operational supervision and noise and odour containment could be gained if all of these elements were incorporated into a single building. Several layout options were considered before the layout now proposed was selected. This comprises a Gasification Hall extending into the central area of the site from behind buildings on the Fifth Avenue frontage, with exhaust gases piped over only a short distance to the stack in the approved central location. As in the layout approved in 2010, the remaining area of open yard in the south-western part of the site will contain the air-cooled condensers for the gasifiers and other ancillary structures such as fire water tanks.
  
- iii). **Landscape treatment** – the landscape strategy for the site remains unchanged in the current proposals with the exception of the green wall that enclosed the gasifier yard in the 2010 scheme. This wall was proposed to screen views of the gasification units and AD tanks. However, now that the gasification units are proposed to be enclosed in a building towards the centre of the site and the AD tanks are being removed this primary need has disappeared. It is proposed instead that the remaining items of external plant are screened by a ‘soft’ landscape scheme of trees and shrubs within the south-western corner of the site, fronting onto Fifth Avenue.

### Environmental protection

4.25 Enviroparks proposes that all of the environmental safeguards embodied in the planning conditions and section 106 planning obligations attaching to the 2010 planning permission should be retained for the current proposals. These include amenity and environmental protection requirements during the construction stage, safeguarding provisions for the Penderyn reservoir to the north of the site, and measures to deter HGV traffic from using local residential roads.