

Chapter 15

Cultural Heritage

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15 Cultural Heritage

15.1 Introduction

- 15.1.1 This Chapter addresses the potential impacts of the proposed Grangemouth Renewable Energy Plant on cultural heritage features. Cultural heritage features are here defined as all relict man-made features pre-dating the First Edition Ordnance Survey mapping (surveyed 1860 in this area) and selected sites post-1860, such as wartime or industrial sites. This includes all Scheduled Monuments and Listed Buildings. This chapter therefore includes all types of historic buildings and archaeological sites. Registered Parks and Gardens and Conservation Areas are dealt with in the Landscape and Visual Amenity Chapter (Chapter 10).
- 15.1.2 Potential impacts of the development of the proposed Renewable Energy Plant upon cultural heritage features could comprise:
- Physical damage to the fabric of cultural heritage features, generally resulting from groundworks associated with the construction of the Renewable Energy Plant, but also potentially from changes to groundwater levels or soil chemistry; and
 - Adverse impacts upon the setting of cultural heritage features, largely this relates to visual impacts.
- 15.1.3 Cultural heritage features considered are listed in a Gazetteer and Concordance (Appendix H) and in the interests of clarity are referred to by Feature (F) numbers issued in the course of this assessment.

15.2 Key Consultations

- 15.2.1 The following bodies were consulted:
- Historic Scotland: In Historic Scotland's scoping response dated the 4th February 2010 they requested "that the impact on the setting of the historic docks in general is considered". To this end a setting assessment of the historic docks is carried out in Section 15.5 of this chapter. They also stated that "*we do not support distance thresholds in assessing impact; rather you should consider assessment of sites that have intervisibility with the site*". This has been addressed by including an Outer Study Area (para 15.3.3) in which features within the Zone of Theoretical Visibility (ZTV) of the Renewable Energy Plant are considered for impacts on their setting if considered to be of high sensitivity to such impacts.
 - A meeting was held with Historic Scotland on 23rd February 2010 at Longmore House. At this meeting the construction of the proposed Renewable Energy Plant and the potential impacts on cultural heritage features were discussed. Historic Scotland's comments with regard to taking into account monuments in the wider landscape have been accommodated by our assessment of cultural heritage assets in the Outer Study Area.
 - Falkirk Council's Keeper of Archaeology and Local History. In early consultation concerns were raised over the impact of the proposed Renewable Energy Plant on the setting of the historic dock structures though he considered that 'as long as the structures in the 40m zone of the dock walls are low this should not be obtrusive'. This concern has been accommodated within the assessment of operational impacts.

15.3 Assessment Methodology and Significance Criteria

Assessment Methodology

Overview

- 15.3.1 This cultural heritage assessment comprises a baseline survey (documentary research and field survey) followed by an assessment of the potential direct and indirect impacts of the construction, operational and decommissioning phases of the proposed plant. Mitigation is proposed and the significance of the residual

impacts assessed. The baseline survey was supplemented with input from a palaeoenvironmental specialist (Appendix H) and a maritime archaeologist.

- 15.3.2 The desk-based assessment covered all known cultural heritage features within the site boundary and the surrounding 1 km. A field survey was carried out to verify the findings of the desk-based assessment and to identify any additional unrecorded features. Cultural heritage features in the wider landscape that are considered to be susceptible to impacts upon their setting were visited.

Study areas

- 15.3.3 The study took in three concentric areas:

- The Inner Study Area. This is based on the application area, including the area of search for the proposed cooling water infrastructure and the indicative grid connection route (Figure 15.1). Within this study area all cultural heritage features are considered in relation to both direct and indirect impacts. Also considered is the potential for previously unrecorded assets to be affected by the development.
- The Middle Study Area. This extends 1 km from the boundary of the application area. Within this area all nationally important features (Scheduled Monuments and Listed Buildings) were considered in relation to potential operational impacts upon setting and inform the potential for previously unrecorded cultural heritage features within the Inner Study Area.
- The Outer Study Area. This is based on the Zone of Theoretical Visibility (ZTV), as defined in the Landscape and Visual Amenity (Chapter 10), within which cultural heritage features highlighted specifically by consultees or identified as being at risk of significant impacts upon setting were considered.

Data sources

- 15.3.4 The desk-based study has been based on readily available and relevant documentary sources. The following archives were referred to:
- National Monuments Record of Scotland (NMRS);
 - Vertical aerial photographs held by the Royal Commission on the Ancient and Historical Monuments of Scotland (RCAHMS);
 - Falkirk Council's Sites and Monuments Record (SMR);
 - Historic Scotland Schedule of Ancient Monuments and List of Listed Buildings;
 - Maps held by the National Library of Scotland;
 - Plans held by the National Archives of Scotland; and
 - Other readily accessible published sources.

Field survey methodology

- 15.3.5 A targeted walkover survey of the Inner Study Area was carried out on the 21st January 2010, guided by modern mapping. The intention of this walkover was to assess the presence / absence, character, extent and condition of known features and to identify any previously unrecorded features.
- 15.3.6 The surrounding area was toured and visits made to cultural heritage features in order to establish the potential for impacts upon their setting and to gather data to allow impacts to be assessed.

Significance Criteria

- 15.3.7 The following methodology is the established practise of the cultural heritage consultants for assessing the sensitivity of cultural heritage features to construction and operational impacts, the magnitude of such impacts and the significance these impacts have on the cultural heritage features and their setting.

Significance Criteria for Construction Impacts

- 15.3.8 Construction work has the potential to damage or destroy cultural heritage assets. This may occur either as a result of the design of the development or as an accidental consequence of construction plant movement. The impacts may be direct, for instance where an archaeological deposit is removed or damaged during ground-breaking works, or indirect, for example where changes in hydrology may lead to waterlogged archaeological deposits becoming desiccated and degraded. Setting impacts pertaining to the construction phase are short-lived and are therefore not considered to be significant and have not been considered further within this chapter.
- 15.3.9 The sensitivity of a cultural heritage asset to construction impacts reflects the level of importance assigned to it. This is the product of a number of factors, including its potential as a resource of archaeological data, its association with significant historical events, its role as a local landmark with cultural associations and its aesthetic value.
- 15.3.10 Official designations applied respectively to archaeological features and buildings have been taken as indicators of importance as they reflect these factors. Scheduled Monuments and Category A Listed Buildings are of national significance; non designated sites considered to be of schedulable quality, are also recognised here as features of national importance. Category B and C(S) Listed Buildings are classified, respectively, as being of regional and local importance¹. It is also recognised that groups of local or regionally significant sites can have a collective group value. Sensitivity is assigned to undesignated cultural heritage assets according to the professional judgement of the assessor.
- 15.3.11 In determining the magnitude of impact, the value or special interest of the asset affected is first defined. This allows the identification of key features and provides the baseline against which the magnitude of change can be assessed, the magnitude of impact being proportional to the degree of change in the asset's baseline value or special interest.
- 15.3.12 The criteria used for defining a cultural heritage asset's sensitivity to direct and indirect physical impacts and then assessing the magnitude of those impacts are summarised in Tables 15.1 and 15.2 below.

Table 15.1 Criteria for Assessing the Sensitivity of Cultural Heritage Assets to Construction Impacts

| Sensitivity of Receptor | Definition |
|-------------------------|--|
| High | Scheduled Monuments, Category A Listed Buildings and undesignated archaeological features of national importance |
| Medium | Category B Listed Buildings and undesignated archaeological features of regional importance |
| Low | Category C(S) Listed Buildings and undesignated archaeological features of local importance |
| Negligible | A badly preserved or extremely common type of archaeological feature or building of little value at local, regional or national levels |

¹ Historic Scotland, July 2009, Scottish Historic Environment Policy, Note 2.19.

Table 15.2 Criteria for Assessing the Magnitude of Construction Impacts on Cultural Heritage Assets

| Magnitude of impact | Definition |
|---------------------|--|
| High | Total loss or major alteration of the cultural heritage asset |
| Medium | Loss of, or alteration to, one or more key elements of the cultural heritage asset |
| Low | Slight alteration of the cultural heritage asset |
| Negligible | Very slight or negligible alteration of the cultural heritage asset |

Significance Criteria for Operational Impacts

- 15.3.13 During the operational phase of a development, buildings and structures may affect the setting of cultural heritage assets. There is considerable debate over definitions of setting and approaches to the assessment of setting impacts², with no standardised industry-wide approach. At present Historic Scotland is working on a guidance note on setting as part of its 'Managing Change in the Historic Environment' series of documents. This has been put out for consultation but is no longer in the public domain. In the course of this assessment, reference has been made to the Historic Scotland document 'Assessment Of Impact On The Setting Of The Historic Environment Resource - Some General Considerations'³. As the title implies this is a document that deals with setting in very general terms and it does not attempt to define setting. However, it states that
- "the archaeological/historic context, the visual appearance and the aesthetic qualities of a site's surroundings play an important role in modern perceptions of the site and that the alteration of those qualities has the potential to impact upon its character and value."*

- 15.3.14 At present there is no accepted means of defining setting in Scottish policy, however English Heritage⁴ has indicated that the definition of a cultural heritage asset's setting 'will normally be guided by the extent to which material change within it could affect the [asset's] significance' and this approach has been adopted here, 'significance' being interpreted as broadly synonymous with 'character and value' in this context. Hence setting is not simply the visual envelope of the asset in question. Rather, it is those parts of the asset's surroundings that are relevant to the character and value of the asset. In general, there will be an appreciable historical relationship between the asset and its setting, either in terms of a physical relationship, such as between a castle and the natural rise that it occupies, or a more distant visual relationship, such as a designed vista or the view from, for example, one Roman signal station to another. The former is referred to in this assessment as immediate setting and the latter as landscape setting. Many assets will only have an immediate setting. Some assets' character and value will relate to an aesthetic relationship with their surroundings. In such instances the relevant landscape elements will be considered to form part of the asset's landscape setting.

Sensitivity

- 15.3.15 The sensitivity of a cultural heritage asset to changes in its setting can be evaluated in the first instance by reference to any relevant designation, whereby those designated as nationally important will generally be considered the most sensitive. Consequently, only nationally important cultural heritage assets in the middle and outer study areas are considered in relation to impacts upon setting. Following this, sensitivity can be

² Lambrick G, 2008 'Setting Standards: A Review' unpublished report by the IFA Working Group on Setting of Cultural Heritage Features.

³ Historic Scotland, 2009, 'Assessment of Impact on the Setting of the Historic Environment Resource – Some General Considerations', Historic Scotland, Edinburgh.

⁴ English Heritage, 2008 Conservation Principles, Policies and Guidance, p39, English Heritage.

more finely assessed by reference to the importance of the asset's surroundings, to its character and value as a cultural heritage asset and the appreciation of its value. Also taken into account is the extent to which an asset is visible on the ground. Some assets may have a well-defined and appreciable setting but the asset itself is barely perceptible; such assets will generally be less sensitive than those that are readily appreciable on the ground.

- 15.3.16 Table 15.3 is a general guide to the attributes of cultural heritage assets of high, medium, low or negligible sensitivity to setting impacts. It should be noted that not all the qualities listed need be present in every case and professional judgement is used in balancing the different criteria.

Table 15.3: Criteria for Assessment of Sensitivity of a Cultural Heritage Asset to Impacts on its Setting

| Sensitivity | Guideline Criteria |
|-------------------|---|
| High | The asset has a clearly defined setting that is readily appreciable on the ground and is vital to its character and value or the appreciation thereof. The asset will generally be readily appreciable on the ground. |
| Medium | The asset's character and value and the appreciation thereof relate to some extent to its setting. The asset will generally be appreciable on the ground. |
| Low | The asset's surroundings have little relevance to its character and value or the appreciation thereof. The asset is difficult to identify on the ground or its setting is difficult to appreciate on the ground. |
| Negligible | The asset is imperceptible in the landscape and its character and value or the appreciation thereof does not relate to its surroundings. |

Magnitude

- 15.3.17 The magnitude of an impact reflects the extent to which relevant elements of the cultural heritage asset's setting are changed by the development and the effect that this has upon the character and value of the asset and the appreciation thereof. Guideline criteria for magnitude defined as high, medium, low or negligible magnitude are described in Table 15.4. As with other criteria presented, this is intended as a general guide and it is not anticipated that all the criteria listed will be present in every case.
- 15.3.18 The following are guides to the assessment of magnitude of impact:
- *Obstruction of or distraction from key views.* Some assets have been sited or designed with specific views in mind, such as the view from a Roman signal station to an associated fort or a country house with designed vistas. The obstruction or cluttering of such views would reduce the extent to which the asset could be understood and appreciated by the visitor. Developments such as that proposed outside a key view may also distract from them and make them difficult to appreciate on account of their prominence. In such instances the magnitude is likely to be greatest where views have a particular focus or a strong aesthetic character.
 - *Changes in prominence.* Some assets are deliberately placed in prominent locations in order to be prominent in the surrounding landscape, for example prehistoric cairns are often placed to be silhouetted against the sky and churches in some areas are deliberately placed on ridges in order to be highly visible. Developments can reduce such prominence and therefore reduce the extent to which such features can be appreciated.
 - *Changes in landscape character.* A particular land use regime may be essential to the appreciation of an asset's function, for instance the fields surrounding an Improvement Period Farmstead are inextricably linked to its appreciation. Changes in land use can leave the asset isolated and reduce its value. In some instances, assets will have aesthetic value or a sense of place that is tied to the surrounding landscape character.
 - *Duration of impact.* Impacts that are short term are generally of lesser magnitude than those that are long term or permanent.

- *Reversibility of Impacts* Readily reversible impacts are generally of lesser magnitude than those that can not be reversed.
- *Impacts upon a defined setting* will be of greater magnitude than those that affect unrelated elements of the asset's surroundings or incidental views to or from an asset that are unrelated to the appreciation of its value.

Table 15.4: Criteria for Assessment of Magnitude of an Impact on the Setting of a Cultural Heritage Asset

| Magnitude | Guideline Criteria |
|------------|--|
| High | The characteristics of landscape elements relevant to the setting of the cultural heritage asset are radically and irreversibly changed as a result of the development, so that the relationship between the asset and its setting is no longer readily appreciable. |
| Medium | The characteristics of landscape elements relevant to the setting of the cultural heritage asset are substantially changed as a result of the development and cannot easily be reversed to approximate pre-development conditions. Relevant setting characteristics can still be appreciated, but, for example, the introduction of new unrelated elements results in distraction from and competition with the relevant setting elements. |
| Low | The characteristics of landscape elements relevant to the setting of the cultural heritage asset are slightly changed as a result of the development, but without adversely affecting the interpretability of the asset and its setting; characteristics of historic value can still be appreciated, the changes do not strongly conflict with the character of the feature, and could be easily reversed to approximate the pre-development conditions. |
| Negligible | The characteristics of landscape elements relevant to the setting of the cultural heritage asset are only imperceptibly changed as a result of the development, or are changed in ways that positively complement the character of the asset; the only noticeable adverse changes to the landscape are to elements that are not considered relevant to the setting of the cultural heritage asset. |

Significance

- 15.3.19 The significance of an impact on a cultural heritage asset, whether a physical impact (direct or indirect) or an indirect impact on its setting, is assessed by combining the magnitude of the impact and the sensitivity of the cultural heritage asset. The matrix in Table 15.5 provides a guide to decision-making but is not a substitute for professional judgement and interpretation, particularly where the sensitivity or impact magnitude levels are not clear or are borderline between categories. Predicted impacts of major or moderate significance equate to potentially significant impacts in terms of the EIA Regulations.

Table 15.5 Criteria for Assessing the Significance of Impacts on Cultural Heritage Assets

| Magnitude | | Sensitivity | | | |
|-----------|------------|-------------|------------|------------|----------|
| | | Negligible | Low | Medium | High |
| | High | Negligible | Moderate | Major | Major |
| | Medium | Negligible | Minor | Moderate | Major |
| | Low | Negligible | Negligible | Minor | Moderate |
| | Negligible | Negligible | Negligible | Negligible | Minor |

15.4 Baseline Conditions and Receptors

- 15.4.1 The Inner Study Area (Figure 15.1) comprises 18.05 ha of low lying land (between 3.93 m and 8.48 m) within the Port of Grangemouth, with the main plant area immediately to the south of the Western Channel and

Carron Dock. In terms of current land use this area is largely covered by hard-standing and a number of roofed buildings.

Designated cultural heritage features within the Inner Study Area

- 15.4.2 There are no designated cultural heritage features (Scheduled Monuments or Listed Buildings) within the Inner Study Area.

Undesignated cultural heritage features within the Inner Study Area

- 15.4.3 There are three undesignated cultural heritages features within the Inner Study Area, all known only from late-nineteenth century map evidence. There is no trace of the features on the ground; nor are they visible on aerial photographs of the area. They comprise the sites of an Iron Foundry (F1), a Hospital (F2) and a row of buildings (F3).

Table 15.6 Cultural Heritage features within the Inner Study Area

| F no | Name |
|------|----------------------------------|
| 1 | Iron Foundry and Saw Mills |
| 2 | Hospital |
| 3 | Row of buildings, Zetland Street |

- 15.4.4 No written records of these three sites have been located. According to map evidence, all three groups of buildings date to the late nineteenth century, having been constructed in the period between 1860 and 1895/96 (the survey dates of the relevant 1st and 2nd edition Ordnance Survey maps). They appear to have been short-lived structures, with only the hospital depicted on the following Ordnance Survey Map of 1915 (surveyed in 1914), although it is labelled there as 'Smithy'. This suggests that the iron foundry and Zetland Street were demolished and removed in the period between 1895/96 and 1914. The subsequent map (revised 1943) shows this area largely in use as railway sidings which indicates that the hospital / 'smithy' (F2) was demolished and removed in the period between 1914 and 1943. The demolition of these structures (F1, F2 & F3), the construction of the railway sidings and their subsequent removal suggest that there will have been such extensive groundworks in this area that subsurface remains of these structures are unlikely to survive.

Potential for previously unrecorded cultural heritage features within the Inner Study Area

- 15.4.5 Located within the area of Grangemouth docks, the application site has been subject to considerable disturbance over the last century with the construction of buildings such as F1, F2 and F3 and their subsequent demolition, the building of railway sidings and their subsequent removal and the levelling of the land for its present use as a storage area. This construction and demolition activity suggests that the potential for previously unrecorded cultural heritage features to survive below ground is limited.
- 15.4.6 The potential for palaeoenvironmental deposits within the Inner Study Area is assessed in depth in Appendix H. In summary, it is considered that the Inner Study Area has, over the course of the Holocene, moved from a sub-tidal to an intertidal and onshore environment. Therefore there is potential for waterlogged sediments, archaeological deposits and structures well-below modern ground level and for these to hold important palaeoenvironmental data. Within the upper deposits most of those traces that might be present would be associated with a mudflat environment such as fish-traps, with the potential for the preservation of macro- and microfossils, that might give evidence for the local environment at the time of deposition, allowing for the possibility of tidal reworking causing disturbance and mixing of the sediments and any palaeoenvironmental material they may contain. Where greater depths of sediment have accumulated the sediments are of sub-tidal origin and would be unlikely to yield evidence of direct relevance to the cultural heritage of the area.

Potential for cultural heritage features to be directly impacted on by the cooling water infrastructure

- 15.4.7 The proposed cooling water discharge pipeline will take one of two routes. Option 1 extends to the north of the proposed Renewable Energy Plant, passing under the Carron Dock to the Forth Estuary beyond; Option 2 extends to the west of the proposed Renewable Energy Plant and runs around the Carron Dock before exiting into the River Carron to the north-west. If Option 1 is adopted, the cooling water infrastructure will be built under the land/water adjacent to the area of the Swing Bridge (F5) but it will not have any direct impacts on the bridge itself. With both options there is potential for surviving remains of the dock infrastructure, comprising cobbles, rail and crane rails to survive within the route.
- 15.4.8 Potential exists for isolated remains such as wrecks and associated debris to be located along the foreshore, in the inter-tidal zone and below the low water mark. Several recorded maritime losses and events, dating to between the late 18th and 20th century, have been recorded in the intertidal environment of the River Carron and the Upper Forth Estuary. These losses and events, however, can only be approximately located. In areas such as the extensive sand and mud flats of Grangemouth and the surrounding area, remains can often be buried in sediments by localised estuarine and fluvial processes.

Potential for previously unrecorded cultural heritage features within the indicative grid connection route

- 15.4.9 The indicative grid connection route runs along the current road corridors of the Central Dock Road, Earls Road, Falkirk Road, Hope Street (A9) and Abbots Road to Bainsford Grid. There are no previously recorded cultural heritage features within the indicative grid connection route, though the route does cross over the Forth and Clyde Canal, a scheduled monument.
- 15.4.10 As there is little recorded evidence of cultural heritage features in this area it is considered that there is limited potential for previously unrecorded cultural heritage features to be located within the indicative grid connection route. The extent to which cultural heritage features will survive within the road corridor is unclear as these will have been subject to truncation and disturbance during the construction of the road and the insertion of utilities and other services. Therefore the potential for cultural heritage features to survive within the indicative grid connection route is considered to be low.

Designated cultural heritage features in the Middle Study Area

- 15.4.11 There are no Scheduled Monuments within the Middle Study Area.
- 15.4.12 There are 10 Listed Buildings within the Middle Study Area. These consist largely of buildings relating to the development of the settlement of Grangemouth in the late 19th to early 20th century and include houses, churches, a school and a cinema. There are also two structures relating to the docks – a late 19th century workshop (F4) and an early 19th century swing bridge (F5). These Listed Buildings are summarised in Table 15.7 and appear on Figure 15.1.

Table 15.7 Listed Buildings within the Middle Study Area

| F No | Name | LB No | Status | National Grid Reference |
|------|--|-------|-------------|-------------------------|
| 4 | Former Workshop Building, Grangemouth Dock | 50868 | C(S) Listed | 292609, 682586 |
| 5 | Swing Bridge, Western Channel and Carron Dock, Grangemouth Docks | 34048 | B Listed | 293697, 681637 |
| 6 | Former La Scala Cinema | 50873 | C(S) Listed | 292755, 682109 |
| 7 | Dundas Church | 34041 | A Listed | 292913, 681991 |
| 8 | 1-14 Strathearn Court, Grange Church | 34046 | B Listed | 292988, 681859 |
| 9 | Zetland Parish Church | 34047 | B Listed | 293038, 681836 |
| 10 | Sacred Heart RC Church | 34040 | C(S) Listed | 292996, 681683 |

| F No | Name | LB No | Status | National Grid Reference |
|------|------------------------------------|-------|----------|-------------------------|
| 11 | Abbotsgrange Middle School | 34045 | B Listed | 293150, 681722 |
| 12 | Avondhu House Hotel and Gate Piers | 34043 | B Listed | 293625, 681602 |
| 13 | Avon Hall and Gatepiers | 34042 | B Listed | 293684, 681574 |

Cultural heritage features considered in the Outer Study Area

- 15.4.13 Within the outer study area only the Antonine Wall (F14) (Figure 15.2), part of the Frontiers of the Roman Empire World Heritage Site, was considered as a site of such sensitivity that it may be subject to an impact on its setting from the proposed Renewable Energy Plant.

Table 15.8 Cultural Heritage Features Considered in the Outer Study Area

| F No | Name | Status |
|------|-------------------|---|
| 14 | The Antonine Wall | World Heritage Site and Scheduled Monuments |

15.5 Potential Impacts

Construction

- 15.5.1 It is considered unlikely that anything will survive of the three cultural heritage features (F1, F2 and F3) within the Inner Study Area. Therefore there will be no construction impacts on these features. The potential for previously unrecorded cultural heritage features is limited and it is considered that there will be no impacts on such features.
- 15.5.2 The surviving remains of the dock infrastructure, comprising cobbles, rail and crane rails, may be removed or covered during the construction of the cooling water infrastructure. These remains are considered to be of negligible sensitivity to construction impacts. Their removal would be an impact of up to high magnitude, resulting in an impact of negligible significance on the relict dock infrastructure.
- 15.5.3 There is limited potential for previously unrecorded maritime archaeological features to be affected by the construction of the cooling water infrastructure. However such features could be of up to regional importance and therefore of medium sensitivity to construction impacts. The construction of the cooling infrastructure could result in damage to maritime archaeological features, as an impact of up to medium magnitude. However, the footprint of the proposed cooling water infrastructure is small and there is therefore limited potential for it to impact on such features. It is therefore considered that there is limited potential for an impact of moderate significance on previously unrecorded maritime archaeological features.
- 15.5.4 There are unlikely to be palaeoenvironmental deposits of relevance to the cultural heritage of the area surviving within the application site. Therefore there will be no construction impacts on palaeoenvironmental deposits.

- 15.5.5 Within the indicative grid connection route there is low potential for previously unrecorded cultural heritage features to survive, given the level of likely disturbance caused by the building of the roads and the insertion of utilities. The effect on cultural heritage remains, if present, could potentially be of up to moderate significance depending on their sensitivity.
- 15.5.6 The indicative grid connection crosses the Scheduled Monument the Forth and Clyde Canal. However, as it will be within the footprint of the A9, there will be no impact on Forth and Clyde Canal.

Operation

- 15.5.7 The potential for the proposed Renewable Energy Plant to affect the setting of cultural heritage features has been considered. It is considered that the proposed development, outwith its immediate surroundings, could not result in an impact greater than of negligible significance to cultural heritage features. This is due to the high number of existing stacks and industrial buildings in the vicinity of the site, which would result in the proposed Renewable Energy Plant appearing as one tall and one smaller stack and industrial structure amongst many. The proposed development will therefore constitute a negligible change to baseline and as such will not have an impact greater than of negligible significance to cultural heritage features within the surrounding area. This also applies to the Listed Buildings (F6 – F13) in the middle study area. The Antonine Wall in the Outer Study Area is the exception to this statement due to its high sensitivity as a World Heritage Site. For this reason it has been taken through to a detailed assessment and is referred to further in Section 15.7 below.
- 15.5.8 Following the advice of the Falkirk Council's Keeper of Archaeology and Local History, the impact on the "setting of the Carron Docks and the Western Channel of the Grange Dock, with the connecting cut and swing-bridge" has been considered and is also taken through to detailed assessment in Section 15.7 below. The term Historic Docks here includes the Former Workshop Building, Grangemouth Dock (F4), the Swing Bridge (F5) and the surrounding docks and associated structures.

Decommissioning

- 15.5.9 Decommissioning of the proposed Renewable Energy Plant would not impact on any cultural heritage features.

15.6 Mitigation

Construction

- 15.6.1 Due to the negligible sensitivity of the known undesignated cultural heritage features (F1, F2 & F3), the probability that nothing survives of these structures and the level of disturbance in this area, there will be no mitigation of construction impacts on these features.
- 15.6.2 The remains of cobbled surfaces and railway/crane tracks within the cooling infrastructure routes will be recorded, and retained as much as practicable, if found. It is also probable that additional areas of cobbles and railway lines are preserved beneath the present tarmac surfaces elsewhere in the proposed development area. If additional areas of relict dock infrastructure are revealed during construction these will also be recorded prior to removal.
- 15.6.3 Within the cooling water infrastructure routes there is limited potential for an impact of moderate significance on previously unrecorded maritime archaeological features. A programme of archaeological works will be agreed with Falkirk Council's Keeper of Archaeology and Local History. This is likely to involve supplying guidelines to contractors which will inform them how to identify maritime archaeological features and a contact number if they do. If features are found, an appropriate programme of works will be carried out by a professional maritime archaeologist and the feature will be preserved by record.
- 15.6.4 Within the indicative grid connection route, there is low potential for previously unrecorded cultural heritage features to survive within the road corridors. A programme of archaeological works will be agreed with Falkirk

Council's Keeper of Archaeology and Local History. This is likely to be a 'watching brief' of any groundworks within the indicative grid connection route to ensure that any archaeological features within it are identified and recorded appropriately.

Operational

- 15.6.5 Given the nature of the operational impacts of the proposed Renewable Energy Plant on cultural heritage features, mitigation is not possible. Furthermore given that no significant impacts are predicted on the setting of cultural heritage features, mitigation is not required.

Decommissioning

- 15.6.6 There are no decommissioning impacts requiring mitigation.

15.7 Assessment of Residual Effects

Construction

- 15.7.1 Where possible, the programme of archaeological works will allow for the preservation in situ of archaeological features that may be present. Where this is not possible, the programme will ensure that any archaeological features that may be disturbed in the course of construction are excavated and recorded appropriately. This will completely mitigate impacts upon these features. Following mitigation, if archaeological features have been recorded, there will be a negligible residual effect, as archaeological data that might otherwise have remained unknown, will be recovered.

Operation

The Historic Docks (F4 – F5 and the surrounding docks)

- 15.7.2 The development of Grangemouth Docks in the 19th century owes much to its role as a 'transit port', linking the eastern limit of the Forth and Clyde Canal with the sea. The port developed in the latter half of the 20th century and now represents a tapestry of development evident in the docks, structures and associated furniture. The setting of the dock structures is their immediate surroundings and their relationship with one another. There are no notable views into these historic docks; nor are views out of importance. As a group the Historic Docks are considered to be of low sensitivity to impacts on their setting. The proposed Renewable Energy Plant will be a new structure within the area of Grangemouth Docks. However, in keeping with many of the structures of Grangemouth Docks, the Renewable Energy Plant will be an industrial feature requiring a dockside setting. It is therefore considered that the proposed Renewable Energy Plant will have an impact of at most low magnitude and therefore of negligible significance on the setting of the Grangemouth Docks.

Antonine Wall (F14) - World Heritage Site and Scheduled Monuments

- 15.7.3 The Antonine Wall was the north-western frontier of the Roman Empire. It comprised a line of forts and fortlets connected by a continuous rampart wall and ditch which stretched across Scotland from Bo'ness on the east coast to Old Kilpatrick in the west. The route followed by the Wall takes advantage of relatively high ground with open views to the north (the source of possible attacks). It is therefore closely related to local topography and views northwards from the wall are particularly important to an appreciation of its wider landscape setting. The location of individual forts and fortlets within this general landscape setting is heavily influenced by the regular spacing required by the design of the frontier.
- 15.7.4 As a World Heritage Site and a structure built to make use of its landscape, the Antonine Wall is considered to be of high sensitivity to impacts on its setting. This sensitivity does vary to a certain extent along its length. The sensitivity of the setting of the Wall is greatly reduced in areas where it is no longer upstanding or discernible in the landscape and in areas where modern development has already obscured the relationship between the Wall and its setting.

- 15.7.5 It is possible that the proposed Renewable Energy Plant will be visible from certain locations along the route of the Antonine Wall. The Wall runs east – west, approximately 3 km south of the proposed Renewable Energy Plant. Therefore, for the section of Antonine Wall closest to the Renewable Energy Plant, the plant will only be visible through the existing mass of stacks which makes up the Grangemouth industrial area. Further west along the Wall, the proposed Renewable Energy Plant will appear as a separate unit to the north of the mass of Grangemouth's industrial stacks. However as stated in the Antonine Wall Management Plan *"Through its eastern 7 km the Wall runs along the northern edge of the Bo'ness Coastal Hills overlooking the Bo'ness Flats, now partly occupied by the petro-chemical works at Grangemouth. The views here are so extensive at this point that the modern industry is over-shadowed by the wide vistas and further mountains."*⁵ It is therefore considered that the operation of the proposed Renewable Energy Plant will be of no more than negligible magnitude on the setting of the Antonine Wall.
- 15.7.6 Following the matrix in Table 15.5 this would result in an impact of minor significance on the setting of the Antonine Wall due to its high sensitivity. However following the above statement from the Antonine Wall Management Plan and using the professional judgement of the assessor; it is considered that the impact of the proposed Renewable Energy Plant on the setting of the Antonine is no greater than of negligible significance.

Table 15.9: Cultural Heritage Features with setting impacts

| F No | Name | Sensitivity | Magnitude | Significance |
|------|--------------------|-------------|------------|-------------------|
| 4, 5 | The Historic Docks | Low | Low | Negligible |
| 14 | The Antonine Wall | High | Negligible | Negligible |

Decommissioning

- 15.7.7 There will be no decommissioning impacts on cultural heritage features.

15.8 Cumulative Impacts

- 15.8.1 This proposed Renewable Energy Plant has been considered along with the proposed Longannet Biomass Plant and the Grangemouth biodiesel project for cumulative impacts on cultural heritage features. Impacts such as the potential encircling of cultural heritage features and the blocking of significant sightlines from and to cultural heritage features arising from the cumulative developments were considered. No significant cumulative impacts on cultural heritage features were identified as a result of the construction, operational and decommissioning phases of the proposed Renewable Energy Plant with any of these developments.

15.9 Summary

- 15.9.1 Potential impacts of the proposed Renewable Energy Plant upon cultural heritage features resulting from its construction, operation and decommissioning have been considered (summarised in Table 15.10).
- 15.9.2 It is considered that construction impacts on cultural heritage features will be of negligible significance.
- 15.9.3 Potential operational impacts upon the setting of cultural heritage features have been considered and assessed for the Historic Docks and the Antonine Wall. The impact on both is considered to be of negligible significance.
- 15.9.4 The potential for cumulative effects has been considered. No significant cumulative impacts are predicted.

⁵ Historic Scotland, 2007, Frontiers of the Roman Empire World Heritage Site Proposed Extension, The Antonine Wall Management Plan 2007-2012, p30.

Table 15.10: Summary of Effects

| Potential effect | Mitigation | Residual effect |
|---|---|-------------------------|
| Construction | | |
| Potential for loss of relict dock infrastructure; cobble surfaces and railway / crane tracks, resulting in an impact of negligible significance. | Recording of the relict dock infrastructure prior to construction commencing and if any is uncovered during construction. | Negligible significance |
| Limited potential for impacts of up to moderate significance on previously unrecorded maritime archaeological features within the construction footprint of the cooling water infrastructure. | Contractors' guidelines and archaeological works as appropriate. | Negligible significance |
| Limited potential for impacts of up to moderate significance on previously unrecorded cultural heritage features within the indicative grid connection route. | An appropriate programme of archaeological works which is likely to be a watching brief of groundworks. | Negligible significance |
| Operation | | |
| Impact of negligible significance on the setting of the Historic Docks | N/A | Negligible significance |
| Impact of negligible significance on the setting of the Antonine Wall | N/A | Negligible significance |
| Decommissioning | | |
| N/A | N/A | N/A |

Abbreviations

The following is a list of abbreviations adopted in Chapter 15 Cultural Heritage.

| | |
|---------------|--|
| AOD | Above Ordnance Datum |
| F | Feature |
| NMRS | National Monuments Record of Scotland |
| RCAHMS | Royal Commission on the Ancient and Historical Monuments of Scotland |
| SMR | Falkirk Council's Sites and Monuments Record |
| ZTV | Zone of Theoretical Visibility |

Chapter 16

Socio-economics

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16 Socio-economics

16.1 Introduction

- 16.1.1 This Chapter of the Environmental Statement provides the socio-economic impact assessment of the proposed Renewable Energy Plant in Grangemouth.
- 16.1.2 The Socio-economic Chapter focuses primarily on the social and economic effects that are likely to occur as a result of the construction, operation and decommissioning of the proposed development. The study area covers the Grangemouth and Falkirk area and the wider area in general, and assess the likely effects that may be caused within the local community.
- 16.1.3 Socio-economic effects can impact both positively and negatively on individuals and communities as a whole that are both directly and indirectly affected by development in a local area. This can also apply to individuals and communities who are not in the immediate local area, but are, nevertheless, affected by the project as a result of associated economic activity, including those involved in the biomass supply chain elsewhere in the country.
- 16.1.4 A key consideration within the socio-economic impact assessment is employment generation, with an average predicted construction workforce of 300 and a maximum of 500 construction workers to be employed on-site during the peak construction period. Approximately 40 staff are expected to be employed during operation of the proposed plant. It is also anticipated that 10 existing and 20 new jobs within the Port of Grangemouth would be associated with the unloading of biomass fuel.

Possible Effects

- 16.1.5 The proposed development has the potential to have positive and negative impacts on local communities and the local economy. Hence the socio-economic chapter considers these potential impacts in terms of the proposed development's planning, construction, operation and decommissioning.
- 16.1.6 The assessment of these impacts involves the collation of a range of baseline social and economic data in relation to the location of the proposed development, the wider surrounding area and the development itself. The assessment then considers the relative significance of each of the potential impacts and where a negative impact is identified proposed mitigation is recommended.
- 16.1.7 Both direct and indirect employment impacts and economic benefits from the development are anticipated during the construction phase, and operation and decommissioning of the project.

Structure of the Chapter

- 16.1.8 Following this introduction, this chapter has five further sections as follows:
- Section 16.2 summarises the key consultations undertaken to inform the socio-economic assessment;
 - Section 16.3 describes the assessment methodology and the criteria used to assess significance;
 - Section 16.4 provides the baseline assessment of the study and surrounding areas. This provides a review of the socio-economic context of the area at national, and local authority levels
 - Section 16.5 specifies the potential socio-economic impacts of the project, together with the key measures and metrics used and the assumptions made in establishing impacts. Furthermore, this section specifies mitigation measures to reduce any negative impacts and then sets out the likely residual effects of the proposed development.
 - Section 16.6 sets out conclusions from the combined assessments of the potential socio-economic impacts of the development of the project.

16.2 Key Consultations

- 16.2.1 Consultation contacts were made with officers of Falkirk Council requesting socio-economic and other relevant background information.

16.3 Assessment Methodology and Significance Criteria

Assessment Methodology

- 16.3.1 The socio-economic assessment is based broadly on the collection of available desk-based information, results of stakeholder feedback and a thorough qualitative assessment of a range of social and economic indicators.
- 16.3.2 Baseline data have been collated through a site and general area visit (to understand the context of the site and its surroundings), use of local and regional planning documents and background studies, findings from associated consultation and use of publicly available data (for example that available from <http://www.sns.gov.uk>). In addition, there were consultations with various bodies that may be affected by the proposed development. This gave the opportunity for those potentially affected to have a reasonable opportunity to comment on the proposed development and to enable identification of appropriate mitigation measures.
- 16.3.3 Following a review of the baseline socio-economics of the site, the following social and economic indicators have been considered:
- Impacts on population characteristics (population change, ethnic and racial distribution, non-permanent resident numbers plus incorporating the assessment of the Renewable Energy Plant employment numbers and assessment on the level of in-migration);
 - Community and institutional structures (recreational activities, existing and community groups, employment/income characteristics and expenditure impacts, including potential supply chain economics);
 - Political and social resources (identification of stakeholders and extent of affected parties, skills levels within the region and assessment as to whether suitably qualified individuals will be available in the local area or if in-migration or training will be required);
 - Individual and family changes (perceptions of risk – residential stability and attitudes towards the project);
 - Local services (health and education impacts plus on-site safety measures, access arrangements, public rights of way and impacts on local services and utilities); and
 - Community resources (land use patterns, including impact on agricultural land and impact on cultural resources).

Study Area

- 16.3.4 The application site is located at the Port of Grangemouth, 1 km to the north west of the town of Grangemouth on the southern bank of the Forth Estuary.
- 16.3.5 The Study Area for this socio-economic assessment was defined as Falkirk Council and its neighbouring Councils: West Lothian, Fife, Clackmannanshire and Stirling. Falkirk is taken to be the local economy for the purpose of this assessment, with the four other Council areas making up the wider economic area.
- 16.3.6 Further investigation into baseline conditions was undertaken during the production of the socio-economic chapter. This included detailed consideration of the demographics and current employment structure, and the surrounding communities were visited to enable a detailed understanding of the neighbourhood profile.

Sources of Information

- 16.3.7 The assessment includes an extensive review of information sources to establish existing conditions, and to inform the assessment and analysis of potential impacts. The datasets used here are those sources of socio-economic and demographic data from standard available datasets, including:
- The 2001 Census;
 - NOMIS labour force data;
 - Scottish Index of Multiple Deprivation;
 - Annual Business Inquiry / Office of National Statistics (ONS);
 - Scottish National Accounts – Type II Income Output and Employment Multiplier tables;
 - Good Practice Guidance – Scottish Enterprise Economic Impact Assessment Guidance Note (January 2007) and English Partnerships Additionality Guide Method Statement 3rd Edition (October 2008);
 - The statutory Development Plan and other planning policy documentation; and
 - Specific individual research, reports, and surveys, which are identified where referenced throughout the chapter.
- 16.3.8 In addition this assessment draws upon data provided by Forth Energy, and comparative research and information on other renewable energy plants, both within Scotland and elsewhere in the UK.

Significance Criteria

- 16.3.9 Table 16.1 presents the evaluation criteria used in the assessment for the level of significance in terms of impact on the economy and community within the survey area, including activities, resources, businesses, and the local population.

Table 16.1: Evaluation of Significance Criteria

| Impact | Definition |
|-------------------|---|
| Major Negative | Where the extent of impacts on activities, resources, local businesses or the local population is large in scale or magnitude, and a large number of people or activities would be affected. |
| Moderate Negative | Where the extent of impacts on activities, resources, local businesses or the local population is small in scale or magnitude, but a large number of people or activities will be affected. Or alternatively Where the extent of impacts on activities, resources, local businesses or the local population is large in scale or magnitude but only a small number of people or activities would be affected. |
| Slight Negative | Where the extent of impacts on activities, resources, local businesses or the local population is small in scale or magnitude and would only affect a small number of people or activities. |
| Neutral / None | No impacts are predicted |
| Slight Positive | Where the extent of impacts on activities, resources, local businesses or the local population is small in scale or magnitude and would only affect a small number of people or activities. |
| Moderate Positive | Where the extent of impacts on activities, resources, local businesses or the local population is small in scale or magnitude, but a large number of people or activities will be affected. Or alternatively Where the extent of impacts on activities, resources, local businesses or the local population is large in scale or magnitude but only a small number of people or activities would be affected. |
| Major Positive | Where the extent of impacts on activities, resources, local businesses or the local population is large in scale or magnitude, and a large number of people or activities would be affected. |

16.4 Baseline Conditions and Receptors

Socio-Economic Policy Context

National Policy

Government Economic Strategy

- 16.4.1 The Government Economy Strategy sets out how the Government will support businesses and individuals and how the Government and public services can be focused to create “a more successful country, with opportunities for all of Scotland to flourish, through increasing sustainable economic growth”¹.
- 16.4.2 Its strategic priorities are:
- Learning, skills and well-being;
 - Supportive business environment;
 - Infrastructure development and place;
 - Effective Government; and
 - Equity².
- 16.4.3 Its strategic objectives are to make Scotland wealthier and fairer, smarter, healthier, safer and stronger and greener³.
- 16.4.4 The Scottish Government intends to meet ambitious sustainability targets while increasing economic growth, improving the environment and moving towards a low carbon economy⁴; and overall delivering a greener Scotland⁵.
- 16.4.5 Energy, with a particular focus on renewable energy, is identified in the Strategy as a key sector under the ‘supportive business environment’ strategic priority heading⁶. The Government is to secure faster, more sustainable growth by strengthening Scotland’s areas of international comparative advantage, through achieving critical mass⁷, boosting productivity and creating the right environment for the competitiveness and growth of high-growth potential sectors⁸. The Government is to ensure that the regulatory environment supports the growth of Scotland’s renewable energy sector⁹.
- 16.4.6 The Strategy indicates that there are “emerging opportunities for productivity improvements to be achieved through better resource efficiency, including greater energy efficiency and improved waste management”¹⁰, which could include the development and operation of renewable energy plants.

¹ The Scottish Government, 2007, Government Economic Strategy, Executive Summary, pp 8.

² Ibid, pp 9 and 10

³ Ibid, pp 14

⁴ Ibid, pp 31

⁵ Ibid, pp 37

⁶ Ibid, pp 38

⁷ Ibid, pp 38

⁸ Ibid, pp 40

⁹ Ibid, pp 50

¹⁰ The Scottish Government, 2007, Government Economic Strategy, Executive Summary, pp 24.

Scottish Planning Policy 2010

- 16.4.7 Planning policy at a national, regional and local level is dealt with in detail in Chapter 5 - Planning. However, here reference is made to elements of planning policy to set the context within which the socio-economic perspective is assessed.
- 16.4.8 The Scottish Government expresses its commitment to and support of renewable energy technology and generation in its Scottish Planning Policy (SPP) document, published in February 2010.
- 16.4.9 Scotland's "current target is for 50% of Scotland's electricity to be generated from renewable sources"¹¹. Hydroelectric and onshore wind power generation are currently mentioned as the main sources of renewable energy supplies. However biomass may also contribute.
- 16.4.10 The Policy also indicates that the "production of heat and electricity from renewable sources will also make an important contribution both at a domestic scale and through decentralised energy and heat supply systems including *district heating and biomass heating plants for businesses, public buildings and community/housing schemes*"¹².
- 16.4.11 Planning authorities are urged to support the development of a range of renewable energy technologies, guiding them to appropriate locations and clarifying issues. All scales of development associated with the generation of energy and heat from renewable sources should be supported taking account of relevant economic, social, environmental and transport issues and benefits¹³.
- 16.4.12 Specifically in terms of biomass, the Policy indicates that socio-economic factors will be of importance in terms of the following: "*location of large scale biomass plants will be determined by a number of factors including the economic costs of transporting fuel materials from source, the availability of feedstock during the year, the location of the end user and the scale of the plant. In some locations there will already be an adequate supply of feedstock from managed woodlands and secondary sawmill products which can be accessed immediately. Further options could be provided by growing energy crops and expanding woodland types in other areas. Development plans should identify sites with the potential to accommodate biomass plants which can be supplied from locally available resources, and should identify the factors that will be considered when making decisions on planning applications, including amenity, air quality and transport issues*"¹⁴.

PAN 45 Renewable Energy Technologies

- 16.4.13 Practice Area Note 45 Renewable Energy Technologies (Revised 2002) indicates that Scotland "has a considerable medium-term resource in the shape of forestry biomass".
- 16.4.14 It indicates that biomass is to be included within the Renewables Obligation (Scotland)¹⁵ and that "Combined heat and power (CHP) is becoming an increasingly attractive option for biomass plants, offering a reliable low-cost heat source for industrial or commercial use.., together with electricity that can be sold to the local grid"¹⁶.
- 16.4.15 Furthermore a renewable energy plant (i.e. a biomass power plant) is an industrial development that can bring secure, skilled jobs to a community in what are often economically depressed areas.

¹¹ Ibid, pp37

¹² Ibid, pp37

¹³ Ibid, pp37

¹⁴ Ibid, pp39 and 40

¹⁵ The Scottish Government, Revised 2002, Energy from Biomass and Wastes, PAN 45 Renewable Energy Technologies, available at - <http://www.scotland.gov.uk/Publications/2002/02/pan45/pan-45> on 11022010

¹⁶ Ibid

Scottish Renewables Action Plan 2009

- 16.4.16 The Renewables Action Plan was published by the Scottish Government in 2009. Its main objectives are to establish Scotland as a UK and EU leader in renewable energy, ensure maximum returns for the Scottish economy and to meet targets for renewable energy production and for emission reductions. The Plan emphasises that there is a need for significant ongoing growth of the bioenergy sector as it is still at an early stage of development.
- 16.4.17 The Scottish Government's vision for bioenergy is to maximise the contribution of sustainable biomass to meet renewable heat and electricity targets, and reduce carbon emissions.¹⁷
- 16.4.18 The Plan states that bioenergy is likely to be one of the main contributors to meeting Scotland's 11% renewable heat target. Renewable heat is a top priority for policy support and biomass is of particular importance as it will deliver the majority of this capacity.

Renewable Supply Chain Gap Analysis Summary Report

- 16.4.19 The Renewable Supply Chain Gap Analysis is a study into the current status of the renewables industry in the UK and an assessment of its future potential. It is split into two study areas: Scotland; and the Rest of the UK.
- 16.4.20 The Study indicates that biomass is a mature technology¹⁸ and identifies opportunities in the sector thus: "development of the UK fuel supply chain for biomass represents opportunities for the agricultural and forestry industries and can result in significant long term employment"¹⁹. However the report also identifies the main threats in the sector to the UK being: "low confidence in biomass project performance continues, leading to no development of fuel supply, especially energy crops, because the risk to individual producers is too high"; and in addition there being: "Shortage in finance due to low confidence amongst investors"²⁰.
- 16.4.21 Recommendations for the biomass sector include:
- "DTI's Renewables UK and the Scottish Economic Development Agencies to maintain dialogue with project developers to ensure that they are aware of existing UK capability.
 - Development Agencies and Scottish Economic Development Agencies to provide underlying guarantees against project failure risk to farmers as an incentive for energy crops.
 - UK Support Agencies to review the support for the growth of energy crops to provide the raw material for biofuel production.
 - UK Support Agencies to encourage alliances between UK Operations and Maintenance (O&M) contractors and non-UK main equipment suppliers to capture maintenance jobs".
- 16.4.22 The Report also predicted that biomass along with onshore and offshore wind will be the largest contribution to the renewables generation mix in 2020²¹.
- 16.4.23 The Report shows that in terms of renewable energy generation, biomass provides the most jobs (economic benefit) in the operational phase of the project and a similar level of jobs in the construction phase compared to other generation types (see Graph 16.1²² and 16.2²³) and the majority of these jobs will be local to the

¹⁷ The Scottish Government (2009) Renewables Action Plan, p.64.

¹⁸ DTI, 2004, Renewable Supply Chain Gap Report Summary, , pp9.

¹⁹ Ibid, pp5

²⁰ Ibid, pp5

²¹ Ibid, pp10

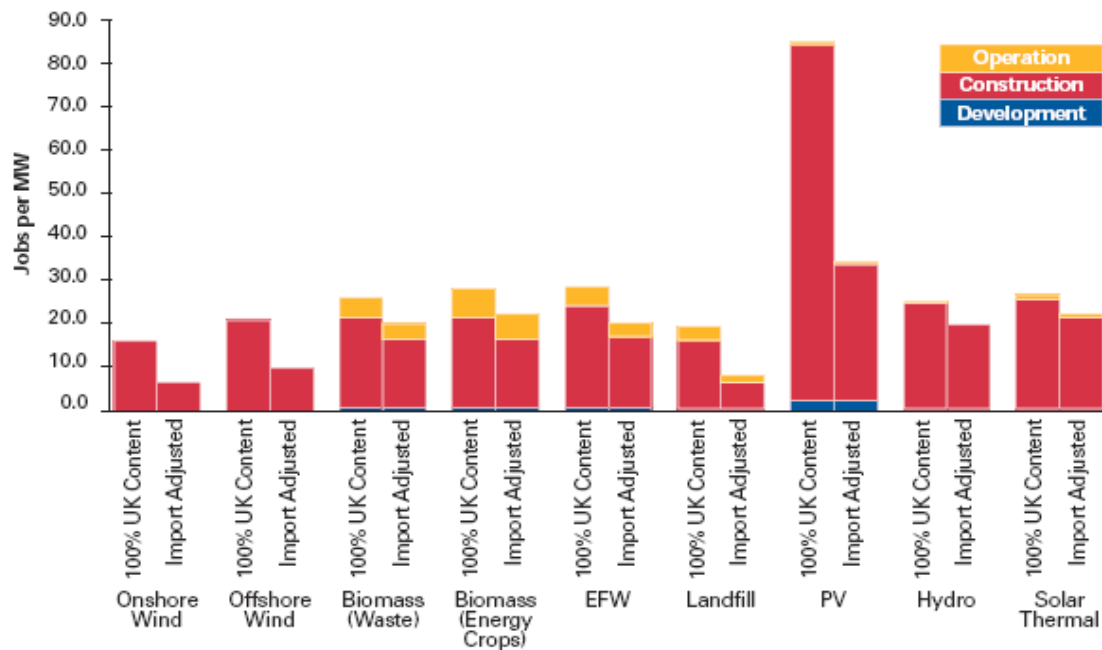
²² Ibid, pp25

²³ Ibid, pp26

plant²⁴. It is also predicted that over the period to 2020 20% of imported skills/employment will be replaced by UK workers²⁵.

- 16.4.24 The study indicates that biomass is not an intermittent resource meaning it possesses the capability to easily integrate on a large scale with the grid and that the UK has strengths in services supporting all stages of project life, and in the manufacturing bulk handling and balance of plant equipment.

Graph 16.1: Jobs per MWe by Phase of the Project Cycle and Technology²⁶



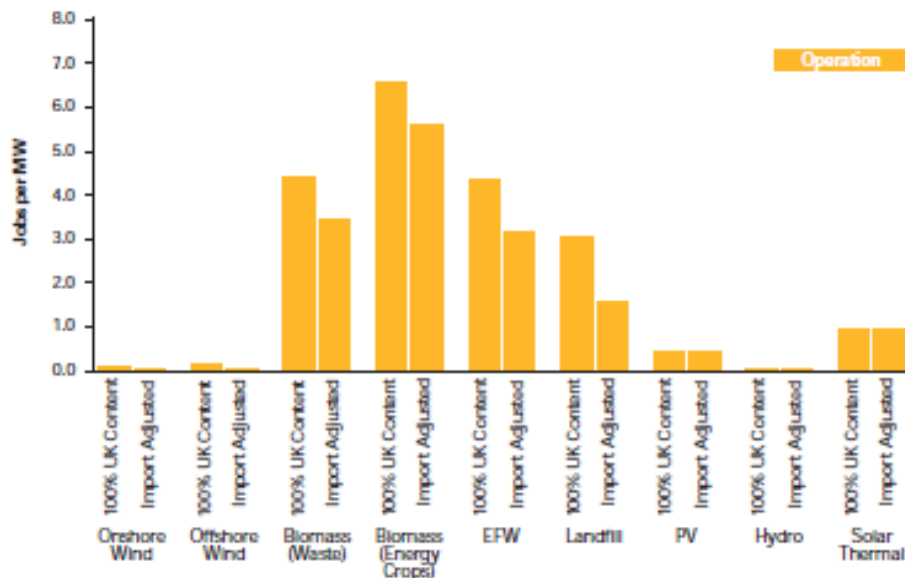
[Note: PV is currently very capital and labour intensive. The market penetration of this technology is low]

²⁴ DTI, 2004, Renewable Supply Chain Gap Report Summary, pp49.

²⁵ DTI, 2004, Renewable Supply Chain Gap Report Summary, pp34.

²⁶ DTI, 2004, Renewable Supply Chain Gap Analysis Summary Report, pp25, available at - <http://www.berr.gov.uk/files/file15401.pdf> on 11022010.

Graph 16.2: Jobs per MWe for Operational Phase by Technology



Biomass Action Plan for Scotland

- 16.4.25 The Biomass Action Plan for Scotland sets out a coordinated programme for the development of the biomass sector in Scotland, summarising existing activities and providing a framework for coordination of existing activities and development of further activities.
- 16.4.26 The Plan recognises that the Scottish biomass sector is growing with major developments at Steven's Croft, near Lockerbie (44 MWe), Invergordon (8 MWe), and Irvine (50 MWe)²⁷. There is, however, still potential to develop the market share of biomass and maximise its contribution to the Scottish Climate Change programme²⁸. This would take account of the range of biomass supply resources including forestry, derived fuel, agriculture and waste, and demand side electricity, heat and transport uses²⁹.
- 16.4.27 Electricity from biomass is recognised by the Plan as being of significance in as much as it contributes towards long term targets for generation from renewables. The feedstock is principally imported material in the form of pellets or wood chip. The Government recognises the benefits of generating heat and power together and combined heat and power (CHP) development is encouraged.
- 16.4.28 The Action Plan indicates that biomass supply is a key issue in Scotland, which has been a barrier to growth and development of the sector. However, subsequent to the 2004 Renewable Supply Chain Gap Report's commentary on limited development of the fuel supply chain, in Scotland the forestry, farming and waste sectors are looking at ways to boost supply to meet the anticipated demand. Care has also been taken not to displace existing commercial markets and signpost developers to private sector supply. This emphasises the awareness of the industry to develop emerging market opportunities.

Scottish Forestry Strategy

- 16.4.29 The Strategy identifies the forestry sector's role in mitigating climate change as being through development of a strong biomass market. There are a large number of forests that are located in rural areas where using

²⁷ Scottish Government, 2007, Biomass Action Plan for Scotland, Executive Summary, pp5.

²⁸ Scottish Executive, 2006, Changing Our Ways: Scotland's Climate Change Programme, available at - <http://www.scotland.gov.uk/Resource/Doc/100896/0024396.pdf> on 12032010.

²⁹ Scottish Government, 2007, Biomass Action Plan for Scotland, Executive Summary, pp5.

wood as a local source of energy can provide new local markets for timber, generate sustainable employment, reduce timber haulage distances and provide opportunities for rural diversification³⁰.

16.4.30 The Strategy advises that the forestry industry in Scotland is to:

- “Support biomass use for renewable energy, facilitating development of an efficient and reliable wood fuel supply chain; and
- Increase wood fuel usage to help achieve the Climate Change Programme targets³¹.

16.4.31 The forestry sector is to facilitate the development of an efficient and reliable wood fuel supply chain, provide dedicated advice through its network of wood fuel information officers.

National Renewables Infrastructure Plan 2010

16.4.32 The National Renewables Infrastructure Plan 2010 (N-RIP) is set within the context of the Round 3, Scottish Territorial Waters, and Pentland Firth and Orkney Waters Crown Estate Leasing Processes, and the continuing momentum being built by the emergence of offshore energy generation technologies. The Plan identifies the development of the offshore renewables industry as an economic growth opportunity that has the potential to bring major economic benefits to many parts of Scotland.

16.4.33 The Plan is intended to set out: *“a spatial framework of first phase sites required to support the development of the offshore renewables industry (wind, wave and tidal). It distinguishes the infrastructure needs of the offshore wind and wave and tidal sector in terms of both timing and nature/location of infrastructure.”*³²

16.4.34 Grangemouth was not identified as one of the first phase locations that could service offshore wind industry needs. However, it was identified within the Plan as having potential for ‘Distributed Manufacturing’ and identified within the listing of sites and on the map showing locations with medium term potential, which could support the industry in the future.

Area Wide Policy and Initiatives

Sustainable Falkirk Strategy 2006-2010

16.4.35 Energy is a priority sector identified in the Sustainable Falkirk Strategy³³, and the Strategy has the objective to: *“identify and measure Falkirk’s contribution to climate change, the potential impacts on the area and steps needed to reduce enhanced climate change in the future”*³⁴.

16.4.36 In terms of renewable energy potential, the Strategy identifies biomass and small scale wind power as the two main areas for potential growth in the Falkirk Council area³⁵. Demonstration projects have been set up with a wind and hydro project at Muiravonside Country Park and district heating schemes using excess heat from the Grangemouth industrial complex.

My Future’s in Falkirk Initiative

16.4.37 The My Future’s in Falkirk initiative is a 10 year economic regeneration plan for the Falkirk area, set up in 2002 to deliver a range of projects aimed at helping businesses to grow, attracting both companies and

³⁰ Forestry Commission, 2006, Scottish Forestry Strategy, pp23.

³¹ Forestry Commission, 2006, Scottish Forestry Strategy, pp24.

³² Scottish Enterprise & HIE, 2002, National Renewables Infrastructure Plan, pp5.

³³ Falkirk Council, Jan 2006, Sustainable Falkirk Strategy 2006-2010, pp15.

³⁴ Falkirk Council, Jan 2006, Sustainable Falkirk Strategy 2006-2010, pp16.

³⁵ Falkirk Council, Jan 2006, Sustainable Falkirk Strategy 2006-2010, pp17.

visitors to the area, creating and maintaining jobs for local people. The partners of the initiative are Falkirk Council, Scottish Enterprise, BP, and Ineos³⁶.

- 16.4.38 Several projects are currently underway in Grangemouth including: the Earls Gate Park serviced business area providing utility connections to the neighbouring KemFine effluent treatment plant and combined heat and power station; Grangemouth Technology Park providing space for Small to Medium Enterprises (SMEs) in the biotech industry particularly for chemical synthesis based biotech and chemicals based pharmaceutical; and the £22 million Grangemouth town centre regeneration project aiming to achieve the upgrading and renewal of the town's town centre and commercial and retail area.

Other Initiatives and Developments

- 16.4.39 The Helix project (overall £50 million) is intended to transform the vacant 300 ha area of land between Grangemouth and Falkirk into a thriving environmental community. Having received a Big Lottery Living Landmarks programme award of £25 million, the Helix will offer 34 km of paths and cycle networks, see 750,000 trees planted, feature five new biodiversity nature parks, and create employment through community enterprise businesses, together with providing support to new 'micro' businesses.

Socio Economic Baseline Context

Population Structure

- 16.4.40 Falkirk Council had an estimated population of 151,600 in 2008. Falkirk's working age population is slightly lower than the Scottish average, 62.3% compared to 62.6% for the whole of Scotland. Within the study area, Fife and Stirling have the lowest working age populations (61.6 and 61.5%), while West Lothian has the highest working age population of 63.5³⁷.

Table 16.2: Total Population and Working Age Population (2008)

| | Falkirk | Clackmannanshire | Fife | Stirling | West Lothian | Scotland |
|----------------------------|---------|------------------|---------|----------|--------------|-----------|
| Total Population | 151,600 | 50,500 | 361,900 | 88,400 | 169,500 | 5,168,500 |
| Working Age Population (%) | 62.3 | 62.3 | 61.6 | 61.5 | 63.5 | 62.6 |

Source: Office for National Statistics Mid Year Population Estimates

- 16.4.41 Since 1998 Falkirk's population has increased by 5.3% due to a positive natural change (births being more than deaths) and in-migration³⁸. This is a relatively strong increase, with only West Lothian having a higher population in the wider area. All Councils within the wider study area experienced an increase in population during 1998-2008, with West Lothian having the largest increase of any of the Council areas in Scotland (see Table 16.3).

Table 16.3: Population Change 1998-2008

| | Falkirk | Clackmannanshire | Fife | Stirling | West Lothian | Scotland |
|-----------------------|---------|------------------|------|----------|--------------|-----------|
| Population Change (%) | 5.3 | 4.3 | 4.4 | 4.3 | 10.6 | 5,168,500 |

Source: GROS

³⁶ June 2008, My Future's in Falkirk Progress Report, pp1, available at http://www.myfuturesinfalkirk.co.uk/News/2008/071108_progress_report.pdf on 08022010.

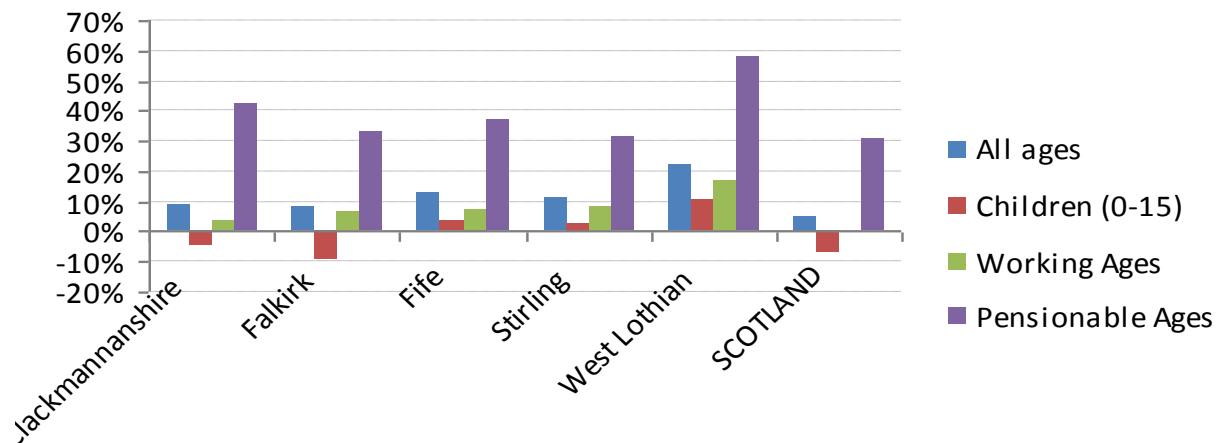
³⁷ Office for National Statistics, Mid-Year Population Estimates 2008.

³⁸ GROS, Components of Population Change by Administrative Area: 1998 to 2008,.

Population Forecast

- 16.4.42 Of the five Councils, Clackmannanshire and Falkirk are expected to see a decline in their child population and the smallest increase in their working age populations. Overall the population is expected to increase in all the Council areas (see Graph 16.3).

Graph 16.3: Population Forecast, by broad age group, 2007-2031



Source: GROS

Economic Activity

Employment and Unemployment

- 16.4.43 Falkirk has a higher than average share of economically active and employees, a higher than average level of unemployment, similar levels of people in employment, and a lower than average self-employment level. The highest proportion of economically active people is in West Lothian which is also the council area with the highest proportion of people in employment in the wider area. The highest level of self-employment is in Stirling, due to its rural nature. Clackmannanshire and Fife have significantly higher than average levels of unemployment. (see Table 16.4).

Table 16.4: Employment and Unemployment (July 2008-June 2009)

| | | Economically Active | In Employment | Employees | Self Employed | Unemployed (model-based) |
|------------------|-----|---------------------|---------------|-----------|---------------|--------------------------|
| Falkirk | No. | 76,500 | 72,400 | 66,500 | 5,600 | 4,600 |
| | % | 79.8 | 75.4 | 69.2 | 5.9 | 6.0 |
| Clackmannanshire | No. | 23,300 | 21,800 | 19,900 | 1,800 | 1,700 |
| | % | 75.9 | 70.9 | 64.6 | 6.1 | 7.1 |
| Fife | No. | 184,200 | 171,300 | 157,500 | 13,800 | 12,500 |
| | % | 79.2 | 73.4 | 67.5 | 6.0 | 6.8 |
| Stirling | No. | 46,000 | 43,100 | 36,900 | 6,000 | 2,600 |
| | % | 79.8 | 74.6 | 65.0 | 9.5 | 5.8 |
| West Lothian | No. | 89,100 | 84,500 | 78,000 | 6,300 | 5,200 |
| | % | 81.1 | 76.8 | 70.9 | 5.7 | 5.8 |
| Scotland | % | 79.7 | 74.8 | 67.4 | 7.6 | 5.3 |

Source: Office for National Statistics annual population survey

Economic Inactivity

- 16.4.44 Fife and Falkirk have the highest levels of economically inactive people wanting a job, while Clackmannanshire has the highest share of economically inactive people not wanting a job. Reasons for economic inactivity include factors such as being a student, long-term illness, retirement and caring-responsibilities.

Table 16.5: Economic Inactivity (July 2008 – June 2009)

| | | Economically Inactive | Wanting A Job | Not Wanting A Job |
|------------------|-----|-----------------------|---------------|-------------------|
| Falkirk | No. | 18,900 | 7,200 | 11,700 |
| | % | 20.2 | 7.7 | 12.5 |
| Clackmannanshire | No. | 7,300 | 2,200 | 5,100 |
| | % | 24.1 | 7.3 | 16.8 |
| Fife | No. | 46,500 | 17,800 | 28,700 |
| | % | 20.8 | 8.0 | 12.8 |
| Stirling | No. | 11,000 | 2,400 | 8,600 |
| | % | 20.2 | 4.4 | 15.7 |
| West Lothian | No. | 20,300 | 7,500 | 12,800 |
| | % | 18.9 | 7.0 | 12.0 |
| Scotland | % | 20.3 | 5.7 | 14.6 |

Source: Office for National Statistics Annual Population Survey

Job Seekers Allowance (JSA) Claimants

- 16.4.45 All Council areas within the wider area have a higher than average proportion of JSA claimants except Stirling, which is significantly lower. Falkirk has a slightly higher than average claimant level (see Table 16.6). Similar to Scotland as a whole, all five Councils have seen an increase in JSA claimants over the past two years³⁹.

³⁹ NOMIS

Table 16.6: Total JSA claimants (December 2009)

| | Falkirk | Clackmannanshire | Fife | Stirling | West Lothian | Scotland |
|---------|---------|------------------|-------|----------|--------------|----------|
| Numbers | 4,093 | 1,674 | 9,960 | 1,836 | 4,724 | - |
| % | 4.3 | 5.3 | 4.5 | 3.4 | 4.4 | 4.1 |

Note: % is a proportion of resident working age population of area and gender

VAT registered businesses

- 16.4.46 Falkirk had the highest percentage rate (13.2%) of VAT registrations for businesses in 2007⁴⁰ of the five council areas and an only slightly higher than the Scottish average for de-registrations. West Lothian had the lowest rate of business de-registrations (see Table 16.7).

Table 16.7: VAT Registered Businesses (2007)

| | | Registrations | De-registrations | Stock (at end of year) |
|------------------|-----|---------------|------------------|------------------------|
| Falkirk | No. | 390 | 205 | 2,950 |
| | % | 13.2 | 6.9 | - |
| Clackmannanshire | No. | 120 | 65 | 945 |
| | % | 12.7 | 6.9 | - |
| Fife | No. | 760 | 535 | 7,500 |
| | % | 10.1 | 7.1 | - |
| Stirling | No. | 345 | 215 | 3,355 |
| | % | 10.3 | 6.4 | - |
| West Lothian | No. | 470 | 225 | 3,630 |
| | % | 12.9 | 6.2 | - |
| Scotland | % | 10.3 | 6.8 | - |

Source: BERR - vat registrations/de-registrations by industry

Labour Market

Job Density

- 16.4.47 Job Density is defined as the number of jobs filled in an area divided by the number of working age residents in that area. Falkirk has a relatively low job density level compared to the Scottish average, which may be due to its central location for commuters. However, it is at a similar level to that of most of the surrounding Council areas. Stirling has a high job density level indicating a high level of job opportunity, while Clackmannanshire has a very low job density indicating a lack of job opportunity, which may result from its proximity to Stirling and Falkirk⁴¹.

Table 16.8: Jobs Density (2007)

| | Falkirk | Clackmannanshire | Fife | Stirling | West Lothian | Scotland |
|----------------|---------|------------------|---------|----------|--------------|----------|
| Number of Jobs | 66,000 | 16,000 | 154,000 | 54,000 | 82,000 | - |
| Job Density | 0.70 | 0.52 | 0.69 | 1.0 | 0.76 | 0.84 |

Source: Office for National Statistics Jobs Density

⁴⁰ VAT registrations/de-registrations by industry, BERR and NOMIS.

⁴¹ NOMIS

Industry Profile

- 16.4.48 Table 16.9 shows the local authority areas' industry profiles within the study area. This is shown as the categories of 'Manufacturing', Construction' and Services; and also in terms of the sub-sets of the 'Services' category.
- 16.4.49 This indicates that Falkirk and Stirling are the two major economic activity centres in the wider study area. While the distribution, hotels and restaurants sector accounts for nearly a quarter of employment in both areas, Stirling has a relatively high proportion of its employment in service occupations (84.9%) and lower manufacturing employment (6.3%). While service occupations account for just 76% of Falkirk's employment, its manufacturing and construction sectors are more significant (respectively accounting for 14% and 9% of the area's employment).

The proportion of West Lothian's employment in construction is 80% higher than the Scottish average. At 23%, public sector employment in West Lothian is significant lower than the 30% seen across Scotland as a whole. Outside Falkirk, manufacturing employment is also relatively high in Clackmannanshire, Fife and West Lothian (40% to 65% higher than the Scottish figure).

Table 16.9: Industry Profile (2008)

| | Falkirk | | Clackmannanshire | | Fife | | Stirling | | West Lothian | | Scotland |
|--|---------|------|------------------|------|---------|------|----------|------|--------------|------|----------|
| | Number | % | Number | % | Number | % | Number | % | Number | % | % |
| Total employee jobs | 59,600 | - | 14,300 | - | 130,300 | - | 45,500 | - | 76,300 | - | - |
| Full-time | 40,300 | 67.5 | 9,400 | 66.0 | 86,500 | 66.4 | 31,600 | 69.5 | 55,800 | 73.2 | 67.8 |
| Part-time | 19,300 | 32.4 | 4,900 | 34.0 | 43,800 | 33.6 | 13,900 | 30.6 | 20,500 | 26.8 | 32.2 |
| Employee jobs by industry | | | | | | | | | | | |
| Manufacturing | 8,300 | 14 | 1,800 | 12.3 | 16,300 | 12.5 | 2,900 | 6.3 | 11,000 | 14.4 | 8.7 |
| Construction | 5,300 | 8.9 | 1,000 | 6.7 | 6,900 | 5.3 | 2,900 | 6.3 | 8,200 | 10.7 | 5.9 |
| Services | 45,300 | 76 | 11,400 | 79.9 | 103,000 | 79.0 | 38,600 | 84.9 | 56,200 | 73.7 | 81.9 |
| Distribution, hotels & restaurants | 14,400 | 24.1 | 3,200 | 22.2 | 29,200 | 22.4 | 11,700 | 25.7 | 18,000 | 23.6 | 22.2 |
| Transport & communications | 3,900 | 6.6 | 600 | 4.0 | 4,400 | 3.4 | 1,400 | 3.0 | 4,500 | 5.9 | 5.1 |
| Finance, IT, other business activities | 6,400 | 10.7 | 1,700 | 12.0 | 17,700 | 13.6 | 8,500 | 18.6 | 11,000 | 14.5 | 19.1 |
| Public admin, education & health | 18,200 | 30.6 | 4,900 | 33.9 | 42,200 | 32.4 | 15,200 | 33.5 | 17,200 | 22.6 | 30.0 |
| Other services | 2,400 | 4 | 1,100 | 7.8 | 9,500 | 7.3 | 1,900 | 4.2 | 5,400 | 7.1 | 5.4 |
| Tourism-related [†] | 4,800 | 8 | 1,100 | 7.8 | 11,800 | 9.0 | 4,600 | 10.0 | 4,700 | 6.2 | 8.9 |

Source: NOMIS

Occupation

- 16.4.50 All Councils in the study area, apart from Stirling, generally have a slightly lower than average level of highly skilled employees and higher levels of skilled and unskilled labour than the Scottish average. Falkirk has a very similar profile to the Scottish average, with a slight bias towards unskilled employment⁴² (Table 16.10).

Table 16.10: Employment by Occupation, % (Jul 2008-June 2009)

| | | Falkirk | Clackmannanshire | Fife | Stirling | West Lothian | Scotland |
|----------------|----|---------|------------------|--------|----------|--------------|----------|
| Highly Skilled | No | 29,400 | 8,600 | 67,400 | 20,500 | 33,600 | - |
| | % | 41.0 | 39.4 | 39.4 | 47.5 | 39.6 | 41.7 |
| Skilled | No | 22,800 | 6,900 | 56,300 | 11,800 | 24,700 | - |
| | % | 31.3 | 31.6 | 32.9 | 27.4 | 29.3 | 31.5 |
| Unskilled | No | 22,200 | 6,400 | 47,500 | 10,900 | 26,100 | - |
| | % | 28.1 | 29.0 | 27.8 | 25.2 | 30.9 | 26.8 |

Source: Office for National Statistics annual population survey

Qualifications

- 16.4.51 In the study area, Stirling has the highest level of NVQ4 and above qualifications (40.2%), significantly greater than the Scottish average (33.8%), while Falkirk has the lowest level (29.6%). Clackmannanshire (32.0%) and Fife (32.7%) also have higher than average NVQ4 qualifications out of the wider study area. Clackmannanshire (19.0%) has the highest level and well above the national average (12.5%) in terms of the proportion of people with no qualifications, while Fife has the lowest level (8.7%), and Falkirk has an almost average level (12.4%).
- 16.4.52 Falkirk has a below average rate of education levels, particularly at a higher grade (Table 16.11).

Table 16.11: Level of Qualifications (Jan 2008-Dec 2009)

| | | Falkirk | Clackmannanshire | Fife | Stirling | West Lothian | Scotland |
|----------------|----|---------|------------------|---------|----------|--------------|----------|
| NVQ4 and above | No | 27,800 | 9,700 | 73,200 | 21,900 | 33,000 | - |
| | % | 29.6 | 32.0 | 32.7 | 40.2 | 30.7 | 33.8 |
| NVQ3 and above | No | 46,900 | 14,800 | 121,800 | 33,400 | 52,900 | - |
| | % | 50.0 | 49.0 | 54.4 | 61.4 | 49.2 | 52.9 |
| NVQ2 and above | No | 64,300 | 19,500 | 163,500 | 41,500 | 74,700 | - |
| | % | 68.6 | 64.3 | 73.1 | 76.3 | 69.6 | 70.3 |
| NVQ1 and above | No | 74,500 | 22,800 | 189,300 | 46,400 | 88,100 | - |
| | % | 79.4 | 75.2 | 84.6 | 85.2 | 82.0 | 80.2 |
| Other | No | 7,700 | 1,700 | 15,000 | 2,400 | 8,200 | - |
| | % | 8.2 | 5.8 | 6.7 | 4.4 | 7.7 | 7.3 |
| None | No | 11,600 | 5,800 | 19,500 | 5,700 | 11,100 | - |
| | % | 12.4 | 19.0 | 8.7 | 10.5 | 10.4 | 12.5 |

Source: Office for National Statistics annual population survey

⁴² This category includes elementary occupations, process plants & machine operatives and sales and customer service occupations

Earnings

- 16.4.53 The median earnings of those working or living in the study area are lower than across Scotland as a whole within the wider study area, with only Clackmannanshire having significantly higher workplace earnings and Stirling having considerably higher than average residence earnings. In Falkirk, Fife and Stirling earnings by residence are higher than earnings by workplace, indicating that a significant proportion of people commute to better paid jobs elsewhere (Table 16.12).

Table 16.12: Earnings, median, £ (2009)

| | Falkirk | Clackmannanshire | Fife | Stirling | West Lothian | Scotland |
|--------------|---------|------------------|-------|----------|--------------|----------|
| By residence | 462.8 | 427.4 | 465.0 | 499.9 | 424.7 | 472.2 |
| By Workplace | 460.0 | 494.7 | 436.4 | 462.0 | 430.6 | 510.2 |

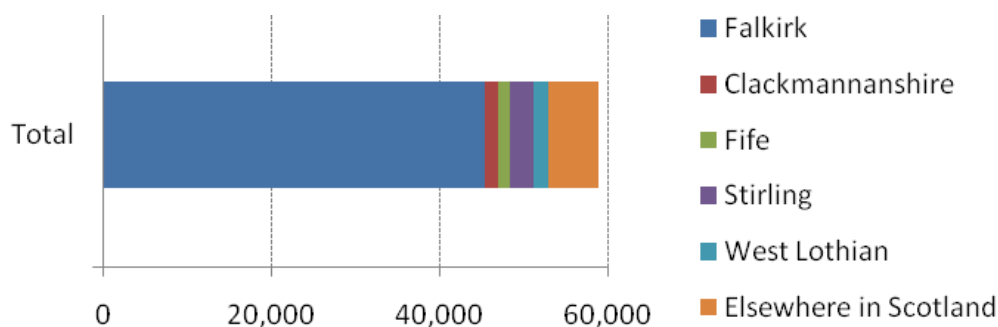
Source: Office of National Statistics Annual Survey of hours and earnings

Travel to Work

Travel to Work Flow

- 16.4.54 77.3% (45,482) of people working in Falkirk live within the Falkirk Council area. Apart from Falkirk, most Falkirk workers commute from elsewhere in Scotland 10% (5,912), and then Stirling 4.5% (2,667), West Lothian 3.1% (1,824), Fife 2.6% (1,502) and Clackmannanshire 2.5 (1,472), which is likely to be due to Falkirk's central location and accessibility by road and rail (Graph 16.5).

Graph 16.4: Residents travelling to Work in Falkirk

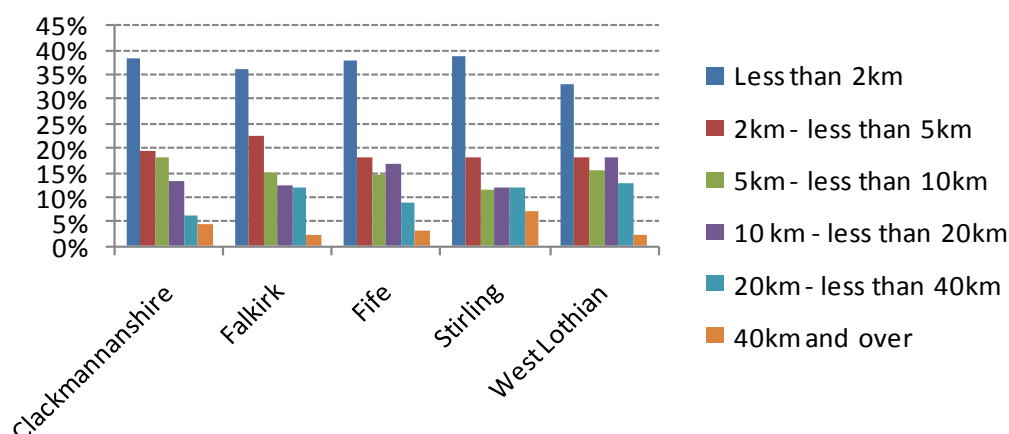


Source: 2001 Census

Distance Travelled to Work

- 16.4.55 Falkirk residents have the shortest travelling times to work of the council areas, with over 59% of workers travelling less than 5 km. Workers living in Stirling and West Lothian travel furthest to work reflecting their relative distance from Edinburgh, Glasgow and other main employment centres (Graph 16.6)..

Graph 16.5: Distance Travelled to Work or Place of Study



Source: 2001 Census

SIMD Deprivation

- 16.4.56 The Scottish Index of Multiple Deprivation (SIMD) is the Scottish Government's official tool for identifying small area concentrations of multiple deprivation. It provides a relative ranking of 6,505 small areas across Scotland from the most deprived (ranked 1) to the least deprived (ranked 6,505). SIMD 2009 is based on 38 indicators in seven 'domains'⁴³.
- 16.4.57 Within the overall study area, Clackmannanshire is the most deprived with just over a fifth of its data zones within the 15% most deprived (see Table 16.13). All of the other Council areas have lower than average employment deprivation.
- 16.4.58 The Falkirk Council's policy in terms of deprivation is that: *"In the Falkirk Council area, community regeneration work is particularly focused on those areas which are most disadvantaged"*⁴⁴. Grangemouth is one of the ten communities that contain at least one datazone in the most deprived 15%, along with the neighbouring communities of Bo'ness, Camelon, Dawson, Denny, Hallglen, Callendar Park Flats, Maddiston, Middlefield and Westquarter.

⁴³ The SIMD 2009 is an update with improvements on the SIMD 2006 and uses the same geographical base as the SIMD 2006 and the SIMD 2004 of datazones. The seven domains, with are the same as in the 2006 and 2004 figures, are: Income; Employment; Health; Education, Skills and Training; Geographic Access to Services; Housing; and Crime - <http://www.scotland.gov.uk/Topics/Statistics/SIMD/BackgroundMethodology> on 141012010.

⁴⁴ Community Regeneration Priority Areas, Falkirk Council website, available at - http://www.falkirk.gov.uk/services/corporate_neighbourhood/policy_performance_review/corporate_policy/community_regeneration/priority_areas_for_regeneration.aspx on 01022010.

Table 16.13: SIMD Deprivation Zones by Local Authority

| Local Authority | 15% Most Deprived Data Zones | | | | | |
|------------------|------------------------------|--------------------|-----------------|-------------------|--------------------|-----------------|
| | SIMD 2006 | | | SIMD 2009 | | |
| | No. of Data Zones | National Share (%) | Local Share (%) | No. of Data Zones | National Share (%) | Local Share (%) |
| Falkirk | 19 | 1.9 | 9.6 | 20 | 2.0 | 10.2 |
| Clackmannanshire | 15 | 1.5 | 23.4 | 13 | 1.3 | 20.3 |
| Fife | 47 | 4.8 | 10.4 | 55 | 5.6 | 12.4 |
| Stirling | 7 | 0.7 | 6.4 | 7 | 0.7 | 6.4 |
| West Lothian | 14 | 1.4 | 6.6 | 17 | 1.7 | 8.1 |
| Scotland | 976 | 100.0 | 15 | 976 | 100.0 | 15 |

Source: Scottish Index of Multiple Deprivation 2009

Location and Surrounding Area

- 16.4.59 The application site is located at the Port of Grangemouth and is currently part of the operational port with warehousing, material storage, and processing in the surrounding area. The surrounding land use within the port area is predominantly industrial, with the neighbouring uses external to the port being the major employment focus of Grangemouth including the petro-chemical complex to the east; other industrial; warehousing and timber storage areas to the west; and an ASDA superstore, mixed use development and the nearest residential areas approximately 200 m away to the south east on the edge of the town centre.
- 16.4.60 There are a number of recreational facilities in the wider surrounding hinterland of the site, which include Falkirk Football Club's Stadium to the southwest, Grangemouth Sports Complex and Grangemouth Sports Stadium to the southwest, and Grangemouth Golf Course to the south south east.

Socio-Economic Baseline Summary

- 16.4.61 Falkirk has experienced an increase in population over the last ten years, as have all other Council areas in the study area, and this is forecast to continue.
- 16.4.62 Falkirk has a higher than average share of economically active people in employment and a lower than average self-employment level. Falkirk has one of the highest levels of economic inactivity in the study area and a higher than average job seekers allowance (JSA) claimant level, which has increased significantly over the last two years. While Falkirk has lower than average employment deprivation, overall levels of deprivation have increased between 2006 and 2009. Furthermore, Grangemouth is one of the ten most deprived communities in the Falkirk Council area.
- 16.4.63 Falkirk has a lower than average job density level and is one of the major economic activity centres in the study area. It has relatively high proportions of people working in the services sector. In terms of skills, Falkirk has a similar profile to the Scottish average with a slight bias towards unskilled employment. Falkirk has below average education levels, particularly at a higher grade. Falkirk has lower than average earnings, with earnings by residence being higher than earnings by workplace, indicating that people commute to better paid jobs elsewhere.

- 16.4.64 Falkirk residents have the shortest travel to work times of the study area, with over 59% of workers travelling less than 5 km. Over two thirds of the people working in Falkirk live within Falkirk, with other workers coming principally from Stirling and elsewhere in Scotland.

16.5 Potential Impacts

Construction Impacts

- 16.5.1 Grangemouth Renewable Energy Plant will involve a capital cost of approximately £360 million to develop.

Employment Generation during Construction

- 16.5.2 The principal socio-economic impacts associated with the construction phase for the proposed Renewable Energy Plant will be direct and indirect employment generated as set out below.

Direct Employment

- 16.5.3 The construction of Grangemouth Renewable Energy Plant is expected to take place over a period of 36 months. An estimated 300 workers will be involved in site construction works over this period, with a peak employment level of 500 employees involved at any one time.
- 16.5.4 It is estimated that an equivalent of 900 person-years will be required for the duration of the construction period of the project. Using accepted good practice in terms of converting temporary employment into full-time equivalents (FTEs)⁴⁵ it is possible to equate construction activity associated with the Renewable Energy Plant to permanent full-time jobs. It is generally accepted in economic appraisals of development schemes that 10 person years of employment is the equivalent of one FTE job. On this basis 900 person years equates to approximately 90 FTE jobs.

Indirect Employment - Multiplier Effects from Construction Employment

- 16.5.5 Using accepted good practice on economic multiplier effects⁴⁶, it is possible to estimate the level of additional job creation that would result from the construction phase of the project. The multiplier effect (indirect and induced employment) would include additional expenditure on local goods and services. This in turn will have an impact in terms of additional revenue brought into local businesses and potential employment creation that is likely to result from this extra trade and spending on accommodation, food, drink and transport by employees.
- 16.5.6 In terms of economic impacts, the sourcing and transportation of labour, materials, and plant to and from the Renewable Energy Plant development site is likely to lead to opportunities for local companies to capture sub-contractor roles.
- 16.5.7 However due to the specialist nature of the combustion plant involved, a proportion of the labour will likely be sourced from outside the local labour market. It is assumed here that this proportion (defined as 'leakage') at a local level would be 20% (defined as 'small to medium'). This is based upon the assumption that the majority of this labour (80%) will be sourced from an area which has experience and a history of heavy engineering and technology, together with the pool of available and experienced construction labour. Hence such labour skills including those for waterside based ground works, utilities, infrastructure, steel erection and fabrication, craneage and plant operation, electricians, plumbing, etc will likely be readily available within the travel to work area.
- 16.5.8 At a Scotland level it is assumed that leakage from the country would be small at 10% representing specialist construction workers brought in from outside the country.

⁴⁵ English Partnerships, 2003, Best Practice Note.

⁴⁶ Scottish Government, 2004 Output Income and Employment Multipliers Scotland.

- 16.5.9 Expenditure on local goods and services and transportation of materials for construction are included within the multiplier effects. These are set out in Table 16.14.

Table 16.14: Multiplier Effects of Grangemouth Renewable Energy Plant Construction

| | Estimated FTEs | Regional Multiplier* | Additional Indirect FTE jobs | Total estimated net additional FTE jobs |
|---|----------------|----------------------|------------------------------|---|
| Travel to Work Area | 90 | 1.93♦ | 49 | 139 |
| Scotland | 90 | 1.93 | 66.3 | 156.3 |
| ♦ based on "construction" employment multiplier, Scottish Input-Output tables | | | | |

- 16.5.10 Assuming that the Gross Value Added (GVA) per employee in the construction industry is £52,805⁴⁷ then total GVA created by construction of the Renewable Energy Plant would be approximately £7.3 million (£7,334,619) at a local level, and £8.25 million (£8,251,447) at a Scotland level.

Summary of Construction Phase Employment Impacts

- 16.5.11 Typically, 300 to 500 people will be employed during the 36 month construction phase.
- 16.5.12 Construction of the Renewable Energy Plant will directly generate the equivalent of 90 FTE jobs, with a further indirect and induced employment of 49 FTE jobs, representing a total estimated net additional local employment equal to 139 FTE jobs, and 156 FTE jobs at a Scotland level.
- 16.5.13 It is likely that a significant proportion of the value within the manufactured items making up the Renewable Energy Plant would accrue outside Scotland due to the limited presence of biomass manufacturing facilities within Scotland. However, it is likely that a significant element of the site clearance and preparation, foundations and ground works, utilities and electrical cabling, transport, port activities, security, and craneage elements of the construction process would accrue to the local Grangemouth and Falkirk economy and indeed the wider regional economy.
- 16.5.14 The temporary employment of typically 300 workers over the construction period would be of benefit and are assessed as being of a moderate positive impact. This is particularly so within a local economy which has been subject to recession in the construction sector, and is expected by commentators to last throughout 2010 and quite possibly for some considerable time thereafter. However, the petro-chemical and renewable energy sectors in the area have continued to provide some support for the construction sector, as would be the case with the Grangemouth Renewable Energy Plant.

Operational Impacts

Establishing Operation Employment Effects

- 16.5.15 The expected operational lifetime of the Grangemouth Renewable Energy Plant is at least 25 years. Forth Energy estimates that there will be a requirement equivalent to 40 full time staff to operate and maintain the Grangemouth Renewable Energy Plant. During the operational

⁴⁷ This is the GVA per Employee for 2007 for the Construction Industry, Scottish Annual Business Statistics 2007 – 1998-2007 Scotland by Division, published by the Scottish Government in 2009, available at - <http://www.scotland.gov.uk/Topics/Statistics/16170/4442>.

phase of the Renewable Energy Plant staff will be required at various levels, consisting of management, administration, technicians, labourers, plant operators, and staff dealing with the handling of both fuels and ash.

- 16.5.16 To estimate net additional direct employment impacts at a local level, leakage (10%) and displacement (20%) rates from the study area would be applied. As there is no currently agreed multiplier for biomass energy generation, the Scottish Government's 2004 established Type II multiplier for electricity production and distribution of 4.83 is the most up to date value available and is applied as a proxy to estimate indirect and induced employment. Using this method direct and indirect employment generated from operation and maintenance is estimated to be approximately 139 FTE jobs at a local level, and 147 FTE jobs at a Scotland level.
- 16.5.17 At a Scotland level it is assumed that leakage from the country would be small at 5% representing operational workers brought in from outside the country.

Table 16.15: Multiplier Effects of Grangemouth Renewable Energy Plant Operation & Maintenance

| | Estimated FTEs | Regional Multiplier | Additional Indirect FTE jobs | Total estimated net additional FTE jobs |
|---------------------|----------------|---------------------|------------------------------|---|
| Travel to Work Area | 40 | 4.83 | 99 | 139 |
| Scotland | 40 | 4.83 | 107 | 147 |

- 16.5.18 It should be recognised that this estimate is based on the assumption that operations and maintenance staff are available locally. It may be the case that a higher leakage rate is appropriate if specialist staff are required to be sourced from outside the area. However, given the number of jobs in question any difference is likely to be limited and is considered negligible for the purposes of this assessment.
- 16.5.19 It is assumed that the appropriate GVA per employee is that for the Electricity, Gas, Steam and Hot Water Supply Industry at £111,913⁴⁸. Therefore the total GVA created by the operation and maintenance of the Renewable Energy Plant would be approximately £15.6 million (£15,580,845) per annum at a local level, and £16.45million (£16,446,447) at a Scotland level.

Establishing Operational and Maintenance Costs

- 16.5.20 The level of annual operational and maintenance expenditure for the development is estimated to be £18 million, and hence over the 25 year operational life of the Renewable Energy Plant, total expenditure would amount to approximately £450 million (at current prices). From this expenditure, there would be numerous opportunities for Scottish, regional and local companies to supply some of the goods and services required for the operation of the Grangemouth Renewable Energy Plant.

⁴⁸ The GVA per Employee for the Electricity, Gas, Steam and Hot Water Supply Industry, Scottish Annual Business Statistics (2007) – 1998-2007 Scotland by Division, published by the Scottish Government in 2009, available at - <http://www.scotland.gov.uk/Topics/Statistics/16170/4442>.

Supply Chain Impacts

Operational Port Employment from Feedstock Trans-shipment

- 16.5.21 The Grangemouth Renewable Energy Plant will create 21 FTE jobs in the port dealing with the shipping and trans-shipment of the feedstock supply, which will be brought in mainly from overseas but also from domestic markets (where short sea shipping is used). To estimate net additional direct employment impacts, leakage (10%) and displacement (20%) rates would be applied. The Scottish Government's 2004⁴⁹ established Type II multiplier for Water Transport of 1.70 is the most up to date value available and is applied to estimate indirect and induced employment. Using this method direct and indirect employment generated from operational port activity related to feedstock trans-shipment is estimated to be approximately 24.5 FTE jobs at a local level and 28.6 FTE jobs at a Scotland level.
- 16.5.22 At a Scotland level it is assumed that there would be no leakage from the country, and that all operational port workers would be recruited from inside the country.

Table 16.16: Multiplier Effects of Grangemouth Renewable Energy Plant Port Operation Supply Chain – Port Feedstock Transshipment

| | Estimated FTEs | Regional Multiplier | Additional Indirect FTE jobs | Total estimated net additional FTE jobs |
|---------------------|----------------|---------------------|------------------------------|---|
| Travel to Work Area | 21 | 1.70 | 4.7 | 25.7 |
| Scotland | 21 | 1.70 | 7.6 | 28.6 |

- 16.5.23 It is assumed that the appropriate GVA per employee is that for the Water Transport Industry at £87,655⁵⁰. Therefore the total GVA created through the port operation during the operation and maintenance phase of the Renewable Energy Plant would be approximately £2.1 million (£2,147,548) per annum at a local level and £2.5 million (£2,503,427) at a Scotland level.

Upstream Biomass Feedstock Employment

- 16.5.24 Given the size of the Renewable Energy Plant and its port location, it is an aspiration of Forth Energy that a minimum of 90% by energy of the biomass feedstock (1,335,000 tonnes per annum) would be virgin woodchips/pellets imported by ship from international sources (See Chapter 6 Proposed Development). However, it is also an aspiration that up to 10% of feedstock supply by energy (212,000 tonnes per annum) would be sourced from sustainable forests within the UK, purpose grown energy crops including short rotation forestry, agricultural residues, and from recovered biomass materials. As a result, this would have the potential to support the upstream supply chain in the forestry sector including employment through harvesting and felling timber, handling and processing, biomass material recovery and transport of feedstock to the Renewable Energy Plant at Grangemouth.

⁴⁹ Scottish Government Input Output Multipliers, available at - <http://www.scotland.gov.uk/Topics/Statistics/Browse/Economy/Input-Output/Downloads> on 12/03/10.

⁵⁰ This is the GVA per Employee for 2007 for the Water Transport Industry, Scottish Annual Business Statistics (2007) – 1998-2007 Scotland by Division, published by the Scottish Government in 2009, available at - <http://www.scotland.gov.uk/Topics/Statistics/16170/4442>.

- 16.5.25 In addition, Forth Energy has an aspiration to increase the volume of indigenous wood-fuel material over the lifetime of the Renewable Energy Plant project. However, this does not represent part of the assessment of impacts included here.
- 16.5.26 A value for tonnes of wood-fuel feedstock per FTE job has been established on the following basis:
- The total potential wood-fuel resource available in Scotland at 2012/2016 is estimated to be 12.213 million oven dry tonnes (ODTs);⁵¹
 - The total number of jobs in the forestry logging and related service activities sector at 2007 was 2,600 FTEs;⁵²
 - The potential wood-fuel resource per FTE job would therefore be 4,697 ODTs;
 - The Renewable Energy Plant will be supplied with 212,000 tonnes of wood-fuel feedstock per annum sourced from Scotland and domestic markets. Thus applying the ratio of 4,697 ODTs per job to this requirement establishes that the number of potential FTE jobs to handle and supply such a scale of wood-fuel resource would be 45 FTE jobs.
- 16.5.27 Of these 45 FTE jobs, most will not be found in the study area or travel to work area, thus 'leakage' will be high at 80% to the rest of Scotland. In addition, due to the increase in the wood-fuel supply from sustainable sources it is unlikely that there would be any displacement of jobs in the market due to market growth. Thus this would result in there being 9 FTE local direct jobs generated through the upstream feedstock supply chain.
- 16.5.28 The Type II employment multiplier for the Forestry Harvesting sector is applied to estimate indirect and induced jobs at 2.18, resulting in 19.6 FTE direct, indirect and induced jobs in the local area, and 78.7 FTE direct, indirect and induced jobs at a Scotland level.

Table 16.17: Multiplier Effects of Grangemouth Renewable Energy Plant Port Operation
Supply Chain – Upstream Feedstock Supply

| | Estimated FTEs | Regional Multiplier | Additional Indirect FTE jobs | Total estimated net additional FTE jobs |
|---------------------|----------------|---------------------|------------------------------|---|
| Travel to Work Area | 45 | 2.18 | 9.0 | 19.6 |
| Scotland | 45 | 2.18 | 36.1 | 78.7 |

- 16.5.29 The GVA per employee applied for the forestry logging and related service activities sector is £28,320⁵³ per annum, which would represent a total local level GVA derived from the upstream wood-fuel resource supply chain sourced within Scotland of £0.55 million (£555,638) per annum locally, and £2.2 million (£2,228,784) per annum at a Scotland level.

⁵¹ 'Increasing the Supply of Wood for Renewable Energy Production in Scotland' – Report by the Woodfuel Task Force to the Minister for the Environment (January 2008) p.18 table.1, available at - <http://www.usewoodfuel.co.uk/Docs/WFTF%20final%20report%20for%20web.pdf>.

⁵² Numbers of jobs in the forestry logging and related service activities sector - <http://www.scotland.gov.uk/Resource/Doc/933/0085531.xls>.

⁵³ The GVA per employee for 2007 for the Forestry, Logging and Related Service Activities Industry, Scottish Annual Business Statistics 2007 – 1998-2007 Scotland by Division: Ibid.

Decommissioning Impacts

16.5.30 Forth Energy has estimated decommissioning personnel numbers as being peaking at around 200, although average numbers would be around 100. It is assumed that skill disciplines required during the decommissioning period would include (but would not be limited to):

- Welders;
- Demolition experts;
- Heavy equipment operators;
- Electricians;
- Foremen;
- Crane operators;
- Labourers;
- Security; and
- Office administrators.

16.5.31 Local contractors will be encouraged to tender for decommissioning works packages. Personnel at all levels will receive appropriate training related to environmental management, and health and safety.

Establishing Decommissioning Employment Effects

16.5.32 It is estimated that the decommissioning of the Renewable Energy Plant will require an average of 100 workers over a period of a year, which will directly generate the equivalent of 10 FTE jobs. To estimate net additional direct employment impacts, leakage (10%) and displacement (20%) rates would be applied. This would lead to a further indirect and induced employment of 3.9 FTE jobs, representing a total estimated net additional local employment equal to 13.9 FTE jobs, and 14.7 FTE jobs at a Scotland level.

Table 16.18 Multiplier Effects of Grangemouth Renewable Energy Plant Decommissioning

| | Estimated FTEs | Regional Multiplier | Additional Indirect FTE jobs | Total estimated net additional FTE jobs |
|---------------------|----------------|---------------------|------------------------------|---|
| Travel to Work Area | 10 | 1.93 | 3.9 | 13.9 |
| Scotland | 10 | 1.93 | 4.7 | 14.7 |

16.5.33 Assuming that the Gross Value Added (GVA) per employee in the construction industry is £52,789⁵⁴ then total GVA created by the decommissioning of the Renewable Energy Plant would be approximately £0.73 million (£733,778) at a local level, and £0.77million (£774,544) at a Scotland level.

⁵⁴ This is the GVA per Employee for 2007 for the Construction Industry, Scottish Annual Business Statistics 2007 – 1998-2007 Scotland by Division, published by the Scottish Government in 2009, available at - <http://www.scotland.gov.uk/Topics/Statistics/16170/4442>.

Aggregate Socio-Economic Benefits

- 16.5.34 The total quantitative economic benefits which would accrue from the construction, operation, supply chain, and decommissioning of the Grangemouth Renewable Energy Plant would be as follows in Table 16.19. In total this represents at a local level 337 FTE net additional local jobs and £26.45 million GVA per annum; and 425.3FTE net additional jobs and £30.1m GVA at a Scottish level, over the overall project period.

Table 16.19 Aggregate Socio-Economic Benefits of Grangemouth Renewable Energy Plant

| Activity | Direct Jobs (FTE) | Multiplier | Additional Indirect + Induced Local Jobs (FTE) | Total Net Additional Local Jobs (FTE) | Local GVA per annum | Total Net Additional Scotland Jobs (FTE) | Scotland GVA per annum |
|--------------------------|-------------------|------------|--|---------------------------------------|---------------------|--|------------------------|
| Construction | 90 | 1.93 | 49 | 139 | £7.3m | 156.3 | £8.25m |
| Operations & Maintenance | 40 | 4.83 | 99 | 139 | £15.6m | 147 | £16.45m |
| Supply Chain Port | 21 | 1.70 | 4.7 | 25.7 | £2.25m | 28.6 | £2.5m |
| Supply Chain Feedstock | 45 | 2.18 | 0 | 19.6 | £0.55m | 78.7 | £2.2m |
| Decommissioning | 10 | 1.93 | 3.9 | 14 | £0.7m | 14.7 | £0.7m |
| Total | 206 | | 156.4 | 337 | £26.45m | 425.3 | £30.1m |

- 16.5.35 Given that this number of net additional local jobs (337 FTE jobs) would be generated by the Grangemouth Renewable Energy Plant, and in the context of the Falkirk Council area having 4,600 registered unemployed, these jobs would represent 7.3% of all those registered unemployed. Thus these quantitative socio-economic benefits are assessed as being of a moderate significant positive impact in the study area.

Skills Matching

- 16.5.36 This section compares the current skills profile in the study area overall and in the construction sector, with the employment requirement for the Renewable Energy Plant in terms of construction and operation and maintenance jobs.

Table 16.20 Skills Matching – Occupation, Construction Jobs and JSA Claimants

| | | Employment Occupation | | | Employee Jobs – Construction (2008) | Total JSA Claimants (Dec 2009) |
|------------------|----|-----------------------|---------|-----------|-------------------------------------|--------------------------------|
| | | Highly Skilled | Skilled | Unskilled | | |
| Falkirk | No | 29,400 | 22,800 | 20,200 | 2,900 | 5.3 |
| | % | 41.0 | 31.3 | 28.1 | 6.5 | 4.093 |
| Clackmannanshire | No | 8,600 | 6,900 | 6,400 | 1,000 | 1,674 |
| | % | 39.4 | 31.6 | 29.0 | 6.7 | 5.3 |
| Fife | No | 67,400 | 56,300 | 47,500 | 6,900 | 9,960 |
| | % | 39.4 | 32.9 | 27.8 | 5.3 | 4.5 |
| Stirling | No | 20,500 | 11,800 | 10,900 | 2,900 | 1,836 |
| | % | 47.5 | 27.4 | 25.2 | 6.5 | 3.4 |
| West Lothian | No | 33,600 | 24,700 | 26,100 | 8,200 | 4,724 |
| | % | 39.6 | 29.3 | 30.9 | 10.7 | 4.4 |
| Scotland | % | 41.7 | 31.5 | 26.8 | 5.9 | 4.1 |

Source: Nomis

- 16.5.37 Table 16.20 aggregates information presented in the socio-economic baseline and provides details of the profile of employment, numbers of construction jobs and JSA claimants/unemployed people in the study area.

Construction

- 16.5.38 The construction of Grangemouth Renewable Energy Plant is expected to take place over a period of 36 months with typically an estimated 300 construction workers involved in site construction works over this period. There will be an estimated peak employment level of 500 involved at any one time.
- 16.5.39 The construction of the Renewable Energy Plant will require construction workers appropriate for all major development projects, in particular energy generation plants. The construction personnel will be required for jobs ranging from site preparation, including site clearance, groundworks and utilities installation, to construction of the main building shell and stack. Specialist and general construction workers will be required as well as workers who are highly skilled, skilled and unskilled.

Table 16.21 Construction Sector Skills Profile (2008)

| | | Falkirk | Clackmannanshire | Fife | Stirling | West Lothian | Scotland |
|----------------|----|---------|------------------|-------|----------|--------------|----------|
| Highly Skilled | No | 1,000 | 700 | 3,600 | 900 | 900 | - |
| | % | 16.0 | 28.0 | 22.0 | 26.0 | 13.0 | 23.0 |
| Skilled | No | 3,500 | 1,100 | 8,900 | 1,700 | 4,700 | - |
| | % | 57.0 | 44.0 | 54.0 | 50.0 | 65.0 | 58.0 |
| Unskilled | No | 1,600 | 700 | 4,100 | 800 | 1,600 | - |
| | % | 26.0 | 28.0 | 25.0 | 24.0 | 22.0 | 20.0 |

Source: Office for National Statistics Annual Population Survey

- 16.5.40 Since the Scottish construction skills profile is an average of all construction workers in Scotland required by general/average construction projects, it is assumed here that the construction worker profile employed to develop the Renewable Energy Plant has a similar split to the Scottish profile in terms of skills (Table 16.21). However, due to the specialist nature of the Renewable Energy Plant, a slightly higher than average proportion of highly skilled and skilled construction labour is likely to be required. Therefore it is assumed that the breakdown would be 25% highly skilled, 60% skilled and 15% unskilled workers, which relates to a requirement for 100 highly skilled, 240 skilled and 60 unskilled construction workers.
- 16.5.41 Within the Falkirk Council area and the wider study area there are significantly more workers in each of these skills categories than will be required by the Renewable Energy Plant. It is likely therefore that a proportion of the required construction workers could be found locally. However, the Renewable Energy Plant may not find all the workers needed with the appropriate skills sets required within the study area and therefore some workers are likely to be sourced from elsewhere e.g. specialist biomass boiler construction workers.
- 16.5.42 Due to the current, difficult economic climate, particularly being experienced within the construction sector, there are likely to continue to be more construction workers available in absolute terms than the project would require. However, much will depend upon the means of procurement of the project.

Operation

- 16.5.43 It is estimated that there will be a requirement of 40 full time staff to operate and maintain Grangemouth Renewable Energy Plant. During the operational phase of the Renewable Energy Plant, staff will be required at various levels; including management, administration, technicians, labourers, plant operators and, fuels and ash staff, as shown in Table 16.22.

Table 16.22 Proposed Staffing Structure for a 100 MWe Renewable Energy Plant

| Job Description | Number of Jobs | Associated Skills Level |
|--------------------------|----------------|-------------------------|
| Plant Manager | 1 | Highly Skilled |
| Operations Manager | 1 | Highly Skilled |
| Maintenance Manager | 1 | Highly Skilled |
| Administration | 2 | Skilled |
| SHE Officer | 1 | Highly Skilled |
| Electrical Supervisor | 1 | Highly Skilled |
| Mechanical Supervisor | 1 | Highly Skilled |
| Technicians | 6 | Skilled |
| Labourers | 2 | Unskilled |
| Shift Manager | 6 | Highly Skilled |
| Shift Plant Operator | 12 | Unskilled |
| Fuels and Ash Supervisor | 1 | Highly Skilled |
| Fuels and Ash Staff | 5 | Skilled |
| | | Percentage of total |
| Total | 40 | 100% |
| Highly Skilled | 13 | 32.5% |
| Skilled | 13 | 32.5% |
| Unskilled | 14 | 35% |

Source: Forth Energy and NOMIS

- 16.5.44 The number of operation and maintenance staff required is relatively modest compared to the large labour pool in the study area (see Table 16.20). Due to the proximity of the Renewable Energy Plant to larger labour market pools in Scotland, such as Edinburgh and Glasgow, a proportion of the operation and maintenance staff are likely to be sourced relatively locally or within wider Scotland.
- 16.5.45 However, the jobs which require highly specialised skills related to biomass power generation may need to be sourced elsewhere outside Scotland.

Skills Matching Conclusion

- 16.5.46 In conclusion it might well be expected that there are sufficient numbers of the appropriate skills sets within the wider local area to satisfy both the construction, and operation labour requirements for the Renewable Energy Plant. However the source of this labour will ultimately depend upon contract procurement and the competitiveness of any contract tenders, and hence the source of labour will depend upon the prevailing economic and construction industry circumstances at the time of construction and when in operation.

Wider Socio-Economic Benefits

Overall Renewables Industry Supply Chain Benefits

- 16.5.47 The proposed development provides opportunities for the involvement of local, regional and Scottish suppliers in a range of activities, including forestry, transport and distribution, project management, civil engineering, component fabrication/manufacture, installation and maintenance. There is expertise in most of these areas in the wider region, although a full forestry and biomass supply chain covering all aspects of biomass plant component manufacture has not yet been developed within the region or indeed within Scotland as a whole.
- 16.5.48 Development of the Grangemouth Renewable Energy Plant will therefore have positive spin-off effects in terms of the development of the renewables sector in Falkirk, Stirling, West Lothian, and Fife, and more generally in Scotland.
- 16.5.49 Demand resulting from development of the scheme would further support production and employment in Scotland, providing a boost to Scottish industry and Scotland's production capacity. Strengthening Scotland's industrial base, particularly in an industry where global demand is growing, improves the ability of Scottish firms to compete in world markets, in turn boosting Scotland's economy.

Biomass Supply Chain Benefits

- 16.5.50 The key consideration in this context is that with an increasing number of biomass schemes either operational, under development or having gained consent in Scotland, the commercial viability and with it job prospects amongst Scottish firms improve. Cluster benefits in the industry increase where firms are supported by final demand and intermediate demand. The net effect is to increase business and employment opportunities within Scotland's renewable energy sector, boosting the performance of local and national economies. The majority of biomass developers in Scotland have expressed an intention to source at least a proportion of their feedstock from sustainable local supplies where possible and would welcome increased capacity on the supply side.
- 16.5.51 Indeed the Biomass Action Plan⁵⁵ recognises that there are constraints to the feedstock supply thus:
- 16.5.52 *"Biomass supply is a key issue in Scotland. In Europe, supply chains are well-developed. But here there is a need for improved assessment of available and future resource, and capacity building; this has been identified as a barrier to growth and development of the sector."*
- 16.5.53 Hence the development of the Grangemouth Renewable Energy Plant and its wood-fuel / biomass feedstock supply chain will provide part of the necessary impetus to increase the feedstock resource supply and in turn improve the overall supply chain in the sector.

Biomass / Wood-fuel Supply and Market Issues

- 16.5.54 The potentially constrained resource supply currently being experienced in Scotland has been raised as an issue by consultees in the process of preparing this assessment. In particular the issue of displacement within the local Scottish market has been raised as an issue of potential concern, this being where the demand for locally sourced wood-fuel

⁵⁵ Scottish Executive, 2007, Biomass Action Plan for Scotland: available at - <http://www.scotland.gov.uk/Publications/2007/03/12095912/17>

feedstock from a major biomass project such as the Grangemouth Renewable Energy Plant might in some way cause displacement and impacts upon market prices. There is no socio-economic evidence to support this concern. However, this issue is covered in more detail in the Sustainability Statement submitted in support of the Section 36 Application, demonstrating the sustainability of the resource supply for this project.

Skills Development Benefits

- 16.5.55 In addition, during the construction process there will be opportunities where those employed will develop skills that will be of benefit to the local economy and to local businesses in the longer term. Further, employment generated through the development will contribute to diversifying the local economy and help support the retention of the working age population.

Renewable Heat Benefits

- 16.5.56 1,114 GWh/annum to 1,580GWh/annum of renewable heat benefit is proposed to accrue from the development of the Grangemouth Renewable Energy Plant, particularly in the industrial and commercial sectors within relatively close proximity of the Plant. These benefits are set out in detail in the CHP Feasibility Study as supporting information to the Section 36 Application.

16.6 Mitigation

- 16.6.1 The following mitigation measures are proposed:-

Construction

Potential Procurement and Skills Initiatives

- 16.6.2 Potential supply chain spin-offs for local businesses represent an important element of mitigation, and an important aim would be to maximise the benefit to the communities within which the Renewable Energy Plant is built. Amongst ways in which this can be achieved is to use local companies to work on the surveying, construction, operation and decommissioning of the Renewable Energy Plant, depending upon the procurement of the project.
- 16.6.3 To achieve this Forth Energy would work in partnership with the Councils and Scottish Enterprise and consider the following:
- Giving preference to local contractors, and other contractors who sub-contract a significant part of their work to local companies;
 - Removing barriers for local involvement – help with establishing Health, Safety, Environment, Quality management systems and understanding contracts;
 - Setting up appropriate training courses; and
 - Compiling a list of local companies interested in working on the project and a list of individuals with their skills from the locality and make these lists available to major contractors.
- 16.6.4 Furthermore, Forth Energy would endeavour to work with the local community to ensure that there are no barriers placed in the way of participation. These barriers can be removed by direct contact with Forth Energy advisors, independent business advisors, workshops, seminars and courses. The common barriers which the developers would seek to remove would include:
- Unfamiliarity with the contracting framework;

- Lack of quality management systems;
- Lack of familiarity with top-end health and safety management;
- Lack of familiarity with environmental management systems;
- Lack of understanding of insurance issues and inability to source insurances; and
- Lack of staff with the correct training or certification.

Potential Skills and Training Initiatives

- 16.6.5 In terms of the development of local skills it is considered feasible that during the construction process there will be opportunities where those employed will develop skills that will be of benefit to the local economy in the longer term. One example of this might be through the enablement of smaller scale community renewable energy developments. Other examples might include project management which could be beneficial in terms of ensuring that local companies or individuals are much better placed to compete for future construction work in the wider area or increasing the number of new starts and supporting small businesses that can benefit from work related to the Renewable Energy Plant in establishing a business. Once established these firms or individuals will be in a stronger position to survive and prosper from ongoing work elsewhere.
- 16.6.6 Every effort will be taken in ensuring that local businesses can be offered the opportunity of participating in its construction, to retain economic benefit and spending locally, and to provide job opportunities for local enterprise. This will be subject for further consideration as the means of procurement are considered and developed.

Operation

- 16.6.7 Every effort would be made in offering local employment opportunities in terms of ongoing maintenance to the local population during the lifetime of the scheme, with wherever possible priority given to locally based contractors for the procurement of ongoing maintenance and operational activities.

Potential Visitor Promotion and Educational Initiatives

- 16.6.8 The Grangemouth Renewable Energy Plant project when operational has the potential to attract interest from visitors to the area and could be a useful educational resource, assisting in raising awareness of climate change and clean energy solutions among the local and wider academic and training community. Initiatives to involve the local community, could be investigated as part of the mitigation discussions, subject to the obvious safety and security issues that could arise.

Decommissioning

- 16.6.9 During the process of decommissioning, local labour market and skills initiatives will be considered for the use of local labour during the process, bringing socio-economic benefits to the local area.

16.7 Residual Effects

- 16.7.1 The following residual effects have been identified from the development of the Grangemouth Renewable Energy Plant project:
- The creation of 206 direct FTE jobs, and a further 157 indirect and induced FTE jobs: a total of 337 FTE net additional local jobs in the local area (when taking into account

leakage and displacement factors); assessed as being of moderate positive impact on the local economy.

- The creation of £26.45 million GVA per annum in the local area; this is assessed as being of moderate positive impact on the local economy.
- The creation of 425.3 net additional FTE jobs at a Scotland level and £30.1 million GVA per annum at a Scotland level; assessed as being of minor positive impact on the Scotland economy.

16.7.2 The expected importation of a limited number of workers involved in construction, and who would be based locally or take up temporary accommodation in the area around Falkirk and Grangemouth. Any social impact on the local area is assessed as being only slight or negligible.

16.7.3 The overall effect of an injection into the local economy of £18 million operating and maintenance expenditure over each year of operational life of the Renewable Energy Plant, and hence over the expected minimum 25 year operational life of the Renewable Energy Plant, total expenditure would amount to approximately £450 million (at current prices). The resulting expenditure and direct and indirect employment generation would have a positive impact upon the local economy. This is assessed as being a moderate positive effect on the local economy.

16.7.4 The project would create a wide range of potential job and skills opportunities for both the local business community and for members of the local labour force.

16.8 Conclusion

16.8.1 The conclusion from this socio-economic assessment is that the development of the Grangemouth Renewable Energy Plant would bring a number of positive benefits to the local economy, assessed here as being of moderate (and hence significant) positive impact.

16.8.2 These positive benefits would accrue from the construction, operation and maintenance, supply chain, and decommissioning of the Grangemouth Renewable Energy Plant over the total project period, and would be:

- 206 jobs directly;
- 157 jobs indirectly;
- 337 jobs in total; and
- £26.45 million of Gross Value Added per annum.

16.8.3 In addition at a Scotland level the Grangemouth Renewable Energy Plant would create the following benefits; assessed here as being of minor positive impact:

- 206 jobs directly;
- 219.3 jobs indirectly;
- 425.3 jobs in total; and
- £30.1 million of Gross Value Added per annum.

16.8.4 The basis and estimation of the direct and indirect job and GVA benefits are outlined in Table 16.23.

Table 16.23: Aggregate Socio-Economic Benefits of Grangemouth Renewable Energy Plant

| Activity | Direct Jobs (FTE) | Multiplier | Additional Indirect + Induced Local Jobs (FTE) | Total Net Additional Local Jobs (FTE) | Local GVA per annum | Total Net Additional Scotland Jobs (FTE) | Scotland GVA per annum |
|--------------------------|-------------------|------------|--|---------------------------------------|---------------------|--|------------------------|
| Construction | 90 | 1.93 | 49 | 139 | £7.3m | 156.3 | £8.25m |
| Operations & Maintenance | 40 | 4.83 | 99 | 139 | £15.6m | 147 | £16.45m |
| Supply Chain Port | 21 | 1.70 | 4.7 | 25.7 | £2.25m | 28.6 | £2.5m |
| Supply Chain Feedstock | 45 | 2.18 | 0 | 19.6 | £0.55m | 78.7 | £2.2m |
| Decommissioning | 10 | 1.93 | 3.9 | 14 | £0.7m | 14.7 | £0.7m |
| Total | 206 | | 156.4 | 337 | £26.45m | 425.3 | £30.1m |

16.8.5 In addition, the wider qualitative socio-economic benefits which would accrue include:

- Overall renewables industry supply chain benefits;
- Biomass / wood-fuel resource supply chain benefits;
- Enhancement in biomass / woodfuel sustainable supply in Scotland;
- A wide range of potential skills and training opportunities; and
- Opportunities for Renewable Heat use for a wide range of neighbouring activities in community, commercial, business, retail, leisure, and residential uses, together with the potential economic benefits which would derive from the operation and maintenance of the new heat network.

Abbreviations

The following is a list of abbreviations adopted in Chapter 16 'Socio-economics'.

| | |
|-------------|--|
| CHP | Combined Heat and Power |
| FTE | Full-Time Equivalents |
| GVA | Gross Value Added |
| IT | Information Technology |
| JSA | Job Seekers Allowance (JSA) |
| km | Kilometre |
| MWe | Megawatt electrical |
| NVQ | National Vocational Qualification |
| ODT | Oven Dry Tonnes |
| SIMD | Scottish Index of Multiple Deprivation |
| UK | United Kingdom |
| VAT | Value Added Tax |

Chapter 17

Aviation & Telecommunication Systems

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17 Aviation & Telecommunication Systems

17.1 Introduction

- 17.1.1 This Chapter provides an assessment of the potential impact which the proposed Grangemouth Renewable Energy Plant may have on communication and aviation facilities in the vicinity of the proposed site.
- 17.1.2 Any large structure, whether stationary or moving, in the vicinity of a beam path between a receiver and transmitter of electromagnetic signals may interfere with those signals and degrade the performance of the transmitter/receiver communication system. Such communication systems include radar and broadcasting signals (i.e. radio, television, radar and mobile phone systems), where the signal is broadcast from a fixed transmitter over an area with dispersed receptors and also fixed links where the signal is broadcast from one fixed transmitter to another. In addition to physically blocking a transmitted signal, under certain conditions, a large structure may passively reflect a signal, so that both the transmitted signal and a delayed signal may exist simultaneously in a zone near the structure. This may result in the 'multi-path' and/or 'Doppler interference effect'.

17.2 Key Consultation

- 17.2.1 Consultations were initiated with the following aviation stakeholders and telecommunication system operators.

Table 17.1: Communication System Stakeholders Consulted

| Communication system category | Stakeholder consulted |
|--|---|
| Aviation: | BAA Aerodrome Safeguarding Ltd |
| | Civil Aviation Authority (CAA) |
| | Defence Estates Safeguarding (DES) (i.e. Ministry of Defence (MoD)) |
| | National Air Traffic Services (NATS) |
| Mobile phone / communications networks | Port of Grangemouth (including Forth and Tay Navigation Service) |
| | Atkins (Global) on behalf of UK Water Industry ¹ |
| | BT |
| | Joint Radio Company |
| | Maritime and Coastguard Agency |
| | Network Rail |
| | Ofcom |
| | Scottish Water |
| Radio and television broadcasters: | BBC |

- 17.2.2 The formal responses received from the above stakeholders are summarised in Tables 17.2 – 17.4.

Aviation Stakeholders

- 17.2.3 Table 17.2 outlines consultation responses from the aviation stakeholders.

¹ This role was previously undertaken by CSS Spectrum.

Table 17.2: Summary of Consultation with Aviation Stakeholders

| Stakeholder | Stakeholder opinion | Current status |
|--|--|----------------|
| BAA Aerodrome Safeguarding (Edinburgh Airport) | The site is outside the area of concern and will have no impact upon Edinburgh Airport. | No objection |
| Civil Aviation Authority (CAA) | Advised that safeguarding maps be checked by Falkirk Council to identify any aerodrome specific safeguarding issues and that Edinburgh Airport be consulted. Advised that there may be a need to install aviation obstruction lighting in the event that other aviation stakeholders such as the aerodrome operators request it. It is assumed that the power station would not vent or flare gas. Also advised that all structures over 300 feet high (approximately 90 m) must be charted on aviation maps by the Defence Geographic Centre. Advised that MoD should be consulted regarding the development. | No objection |
| Defence Estates Safeguarding (DES) | DES advised that they have no objections to the application and that aviation warning lighting is not needed for this development with respect to MOD procedures. | No objection |
| National Air Traffic Services (NATS) | No conflict with the safeguarding criteria. NATS requests that it be further consulted on any changes to the information supplied prior to any planning permission or any consent being granted. | No objection |

Mobile Phone / Communications Networks

17.2.4 Table 17.3 outlines the consultation responses from public communications mobile network operators.

Table 17.3: Summary of Consultation with mobile phone / communications networks

| Stakeholder | Stakeholder opinion | Current status |
|--|---|----------------|
| Port of Grangemouth (including Forth and Tay Navigation Service) | The location chosen does not block any existing wireless communications. Services for both voice and data are located along the line of the road and rail lines either side of the main plant site | No objection |
| Atkins Global on behalf of UK Water Industry | The application was examined in relation to the UHF Radio Scanning Telemetry used by their client in that region and advised that they have no objection to the proposal. This response did not relate to Scottish Water's microwave links. | No objection |
| BT | Proposal was studied with respect to BT point-to-point microwave radio links. Conclusion is that project should not cause interference to BT's current and presently planned radio networks, as long as no movement outside 50 m from coordinates proposed. Following a revision to the stack location, BT were consulted a second time and BT confirmed that they had no objection to the proposals. | No objection |
| Joint Radio Company (JRC) | JRC do not assess/comment on building applications. | No objection |
| Maritime and Coastguard Agency | No response received | |
| Network Rail | No issues raised with respect to telecommunication systems | No objection |
| Ofcom | Indicated verbally that only consider wind farm applications | No objection |
| Scottish Water | No issues raised with respect to telecommunication systems | No objection |

Radio and Television Broadcasters

- 17.2.5 Table 17.4 outlines consultation responses from the radio and television broadcasting stakeholders.

Table 17.4: Summary of Consultation Responses from the Radio and Television Broadcasting Stakeholders

| Stakeholder | Stakeholder opinion | Current status |
|-------------|--|--|
| BBC | BBC Scotland would not normally respond on development proposals unless there are very specific local issues which in this case there is not. Recommend use of the BBC online tool to estimate the number of homes' signals that may be affected, however this is only applicable to wind turbine developments. | Modelling has been undertaken to estimate the Zone of Theoretical Shadowing caused by the proposed development. This found that the zone would cover an area encompassing approximately 50 residential properties. |

17.3 Assessment Methodology and Significance Criteria

Assessment Methodology

- 17.3.1 The assessment of the impact of the proposed Renewable Energy Plant on communication systems was primarily based on consultation with the systems operators to establish the location of existing communication systems equipment and to ascertain whether, in their professional opinion, the proposed development would impact on this equipment.
- 17.3.2 In addition, impacts on television reception have been assessed through the use of a Zone of Theoretical Shadowing of TV signals. There are currently three main sources of television signal in the UK: terrestrial; cable; and satellite. Terrestrial signals have historically been provided by analogue services. However, by the time the construction of the proposed development begins, the services provided in the Grangemouth area will be digital only. New or existing developments can cause interference with terrestrial and satellite signals, causing areas of poor or no signal strength, sometimes referred to as "signal shadows". A Zone of Theoretical Shadowing was therefore estimated based on the location of TV transmitters, the dimensions of the main buildings proposed, and the topography of the area, as shown in Figure 17.1.

17.4 Baseline Condition and Receptors

- 17.4.1 The consultation exercise has indicated that there are no communication links of concern with respect to this development.
- 17.4.1 Edinburgh Airport is located some 24 km south east of the site and Glasgow airport is located just over 47 km to the south west of the site. No military aviation restricted areas, such as low flying or tactical training areas are located in the immediate vicinity of the proposed Renewable Energy Plant.
- 17.4.2 TV signals are transmitted in the Grangemouth area from various sources, including the Black Hill transmitter (NS828637) and the Craigkelly (NT233872) transmitter.

17.5 Potential Impacts

Construction

- 17.5.1 The most likely source of impacts on communication systems during construction of the Renewable Energy Plant is from the erection of the main structures and 110 m stack. Given the interrelationship between the potential impacts during construction and operation of the Renewable Energy Plant, the potential impacts

associated with the construction phase are not considered further as the assessment of the operational phase presented in the sections below covers all the relevant issues.

Operation

- 17.5.2 There are no known impacts predicted with respect to commercial private or defence aviation interests in the area. The MoD, NATS, CAA and BAA Aerodrome Safeguarding (Edinburgh Airport) have advised that they have no objections to the application. NATS requests that it be further consulted on any changes to the information supplied prior to any planning permission or any consent being granted.
- 17.5.3 As indicated in Table 17.3 no objections have been raised by the communication link operators to the proposals. As the Renewable Energy Plant will not impinge on either Central Dock Road to the north or the railway line to the south, there will be no impact upon the voice and data services, which were noted by the Port of Grangemouth / Forth and Tay Navigation Service as being present along these routes. There is therefore no potential impact on communication systems.
- 17.5.4 The proposed development may impact on TV reception in Grangemouth by “shadowing” the TV signals provided, primarily the relay transmission from the Craigkelly transmitter. Modelling has been undertaken to estimate the Zone of Theoretical Shadowing cause by the proposed development. This has found that the zone would cover an area encompassing approximately 50 residential properties, as shown in Figure 17.1.

Decommissioning

- 17.5.5 As decommissioning will involve the removal of the stack and structures of the Renewable Energy Plant, no impacts are envisaged.

17.6 Mitigation

Construction

- 17.6.1 No mitigation measures are proposed at this stage of the project.

Operation

- 17.6.2 The CAA noted that there may be a need to install aviation obstruction lighting in the event that other aviation stakeholders such as the aerodrome operators request it. However due to the absence of any such aerodromes in the vicinity of the site, obstruction lighting is not envisaged. The CAA advised that all structures over 300 feet high (approximately 90 m) must be charted on aviation maps by the Defence Geographic Centre and therefore the latter will be contacted prior to the construction of the Renewable Energy Plant with respect to the 110 m stack.
- 17.6.3 Mitigation of the potential impacts on television reception can be via a number of methods, including:
- Improving the receiving antenna by installing a new, higher gain antenna;
 - Installing a mast-head amplifier, boosting the received signal;
 - Relocating or redirecting the receiving antenna. Simply moving the antenna to a different point on the building, or even just turning it to a slightly different angle, can often result in significant improvements in the received signal; and
 - Redirecting the receiving antenna to receive a signal from an alternative transmitter.
- 17.6.4 In the event that none of the above has resulted in a satisfactory signal, there are a number of alternative options available to Forth Energy, including (in no specific order):
- Installing a digital cable television service;
 - Installing a digital satellite television service (e.g. Sky's free-to-view service FreeSat);

- A 'self-help' system where a signal 'master' antenna feeds an amplified signal to affected buildings by cable or radio; and
- The provision of an alternative rebroadcast transmitter.

Decommissioning

17.6.5 No mitigation measures are considered necessary during decommissioning.

17.7 Residual Effects

Construction

17.7.1 No impact is predicted on communication systems during construction of the Grangemouth Renewable Energy Plant during construction.

Operation

17.7.2 It is envisaged that with the proposed mitigation measures in place, no impact is predicted on communication systems during operation of the Grangemouth Renewable Energy Plant.

Decommissioning

17.7.3 No impact is predicted on communication systems during decommissioning of the Grangemouth Renewable Energy Plant.

17.8 Assessment of Cumulative Effects

17.8.1 Television reception at homes potentially affected by the Grangemouth Renewable Energy Plant may also be affected by other proposed large structures such as wind turbines (for example the Forth Energy Wind Turbine Development). Forth Energy will work to ensure that there is no cumulative deterioration in television reception. As the local authority will ensure that developers of other projects adopt a similar strategy, no cumulative impact on television reception will be experienced.

17.8.2 No cumulative effect on communication systems as a result of the construction, operation or decommissioning of the Grangemouth Renewable Energy Plant is predicted.

17.9 Summary

17.9.1 This Chapter provides an assessment of the potential impacts that the proposed Renewable Energy Plant may have on existing communication systems, in the vicinity of the development site.

17.9.2 In assessing the potential impacts, Forth Energy has consulted widely to establish the presence of existing communication systems in the area and to ascertain whether, in the stakeholders' professional opinions, the proposed development will impact on this equipment. The consultation exercise has indicated that there are no communication links of concern with respect to this development.

17.9.3 Forth Energy will put in place mitigation measures to address deterioration identified with respect to TV reception, where this is a result of the proposed development.

17.9.4 The adoption of the proposed mitigation measures will ensure that no impact will occur on any aviation or communication systems during construction, operation or decommissioning of the Grangemouth Renewable Energy Plant.

Abbreviations

The following is a list of abbreviations adopted in Chapter 17 Aviation & Telecommunication Systems.

| | |
|-------------|----------------------------------|
| BBC | British Broadcasting Corporation |
| CAA | Civil Aviation Authority |
| DES | Defence Estates Safeguarding |
| km | kilometre |
| m | metre |
| NATS | National Air Traffic Services |
| MoD | Ministry of Defence |
| OS | Ordnance Survey |
| TV | Television |
| UK | United Kingdom |

Chapter 18

Traffic and Transport

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18 Traffic and Transport

18.1 Introduction

- 18.1.1 This chapter provides an evaluation of the potential environmental impacts resulting from development generated traffic. A Transport Statement (TS) has also been prepared and is included as Volume 4 of this ES. The TS describes in detail the baseline traffic conditions around the proposed development and the predicted changes and impacts on traffic during the development of the plant. These details are not repeated in this assessment of environmental impacts.
- 18.1.2 The scope of this assessment is to: illustrate the routes that traffic generated by all phases of the development will take when arriving at and departing from the site; estimate likely traffic volumes; and provide an assessment of the resultant environmental impacts for the construction and operational phases of the proposed facility.
- 18.1.3 Traffic levels during the decommissioning phase will be significantly lower than the construction phase and there will be no Abnormal Indivisible Loads (AIL). This phase of the development has not therefore been assessed further.
- 18.1.4 This chapter considers the environmental impact of traffic for the proposed development for the following scenarios:
- Construction (2012-2015); and
 - First Operational Year (2015).
- 18.1.5 The principal environmental impacts resulting from development generated traffic will occur during the construction phase due to the need to bring construction staff, civil works traffic; mechanical works traffic and delivery of AIL to the site. The Construction site will operate on a single day-shift system, Monday – Saturday, between 0700 to 1800 hours, (comprising a 10 hour shift plus a 1 hour break). Parking for construction staff vehicles will be provided entirely within the Port of Grangemouth secure port estate.
- 18.1.6 Once operational, the plant will work a shift system on a seven-day shift pattern. This would equate to the following staff/shift profile:
- 0800-1700 = 24 staff;
 - 1700-2400 = 4 staff;
 - 2400-0800 = 4 staff.
- 18.1.7 The environmental impact of both construction and operational traffic has assessed for the peak hours associated with the above time periods.

18.2 Key Consultations

- 18.2.1 Discussions have been held with Falkirk Council Transport Division and Transport Scotland regarding the scope of the assessment to evaluate the traffic impact of the proposed Renewable Energy Plant (Volume 5 Appendix B). The consultation included the scope and methodology of assessment required for the TS in terms of staff numbers, traffic composition, accident data and construction traffic routeing, traffic flow scenarios, assessment years, the highway network of interest, accident data and trip distribution patterns.
- 18.2.2 Transport Scotland and FC have confirmed that a full Transport Assessment of the proposals was not required and that the assessment should focus on the impact arising from traffic during the construction phase. Subsequently a Transport Statement was produced in accordance with the guidance provided by the consultees.

18.3 Assessment Methodology and Significance Criteria

Assessment Methodology

- 18.3.1 The environmental impact of the development generated traffic has been assessed with reference to the 'Guidelines for the Environmental Assessment of Road Traffic'¹ (EART) published by the Institute of Environmental Assessment. In accordance with this guidance, issues including: severance; driver delay; pedestrian amenity and delay; accidents; and safety have been investigated.
- 18.3.2 The Transport Assessment has also been undertaken in accordance with PAN 75 'Planning for Transport'.
- 18.3.3 An assessment of noise and air emissions arising from construction traffic is included in Chapter 11, Noise and Vibration and Chapter 9 Air Quality. Details of these assessments are not repeated here.
- 18.3.4 There have been no difficulties experienced in the compiling of this Chapter, and hence the work was undertaken as per the scope agreed with the consultees.

Significance Criteria

- 18.3.5 For evaluation purposes, the scale of the environmental impacts associated with construction and operational traffic have been categorised as outlined within Table 18.1.

Table 18.1 Traffic Assessment Significance Criteria

| Significance Rating | Description of Significance |
|---------------------|---|
| Major | Where the impact leads to serious and lasting disruption (e.g. a 90% increase in baseline traffic) and permanent mitigation measures are required. |
| Moderate | Where the impact is of a temporary nature, leading to disruption (e.g. a 60% increase in baseline traffic) and short term mitigation measures are required. |
| Slight | Where the impact exceeds industry standard design thresholds, or the traffic increase is above 30%, but does not lead to disruption. No mitigation measures are required. |
| Insignificant | No perceivable impact. No mitigation measures are required. |
| Positive | Where the proposals result in an improvement to current conditions. |

18.4 Baseline Conditions and Receptors

Local Road Network

- 18.4.1 The Port of Grangemouth secure port estate can be accessed from two locations; via Central Dock Road and via Powdrake Road / South Shore Road. For the purposes of the development, Central Dock Road will be the only access. Central Dock Road forms an arm of the A904 Earls Road / Station Road roundabout, is street lit and has a footway on its south westerly frontage. The port security barriers are located approximately 250 metres from the roundabout. The limit of local authority adoption of the road is approximately half way between the port security barriers and the roundabout. The speed limit from this point and on all internal port roads is 20 mph.
- 18.4.2 The A904 Earls Road is a single carriageway road with a footway located on the western frontage. The road is subject to a 30 mph speed limit and is street lit. The A904 falls under the control of FC and provides direct access to the trunk road network at Junction 6 of the M9 Motorway for westbound traffic. Access for eastbound traffic onto the M9 Motorway is provided via the A904 Earls Road and A905 Beancross Road or alternatively via the A904 Earls Road, Falkirk Road and the A9 Laurieston Bypass to Junction 5. The M9 Motorway, as with the wider trunk road network, is under the control of Transport Scotland.

¹ Guidelines for the Environmental Assessment of Road Traffic Institute of Environmental Assessment. 1993.

- 18.4.3 The A905 Glensburgh Road links the M9 Junction 6 exit slip road through to the M9 Junction 6 grade separated roundabout. It is a street lit single carriageway road with a footway adjacent to the carriageway on its westerly frontage and a footpath set back behind a verge on its easterly frontage. At the large staggered junction with the M9 Motorway Junction 6 exit slip road on the westerly side and the Forth & Clyde Way on the easterly side, a large central reserve separates the opposing lanes of the A905 Glensburgh Road.
- 18.4.4 The A905 Beancross Road links the two grade separated roundabouts of the M9 Junction 5 and Junction 6. The street lit, single carriageway road contains several roundabouts and priority junctions leading into both residential and industrial areas to the north and the south.
- 18.4.5 The Forth & Clyde Way runs north east from its junction with the A905 Glensburgh Road. No footways exist on either side of the carriageway, however Dalgrain Road runs adjacent to the Forth & Clyde Way for the majority of its length. This secondary road contains a footway on the north westerly frontage. The Forth & Clyde Way becomes South Bridge Street which does contain footways on both sides of the carriageway and links into the A904 Earls Road / Station Road roundabout. Both the Forth & Clyde Way and South Bridge Street are street lit.
- 18.4.6 The A9 Laurieston Bypass is a single carriageway urban clearway which links The Falkirk Road roundabout to the M9 Junction 5. The route is street lit and is subject to the national speed limit with no adjacent footpaths.

Background Traffic Data

- 18.4.7 Traffic flow scenarios have been derived for the anticipated peak period of construction, namely 2014. Background traffic flows were provided by FC which comprised turning count data generated from an automatic traffic counter in the area of interest in 2008 and 2009.
- 18.4.8 The TS, upon agreement with the consultees, focused upon the following junctions:
- M9 Junction 6 roundabout;
 - M9 Junction 6 exit slip / Glensburgh Road priority junction;
 - M9 Junction 5 roundabout;
 - A9 / A904 Falkirk Road roundabout; and
 - A904 Earls Road / North Shore Road roundabout.
- 18.4.9 In addition, it was agreed that the assessment should also consider the flow increases on the following links for the purpose of assessing the environmental impact of the increases:
- A9;
 - A9 Hope Street;
 - A904 Falkirk Road; and
 - Forth & Clyde Way.
- 18.4.10 The traffic flows were expanded to future year levels using central growth factors derived from the National Road Traffic Forecasts (NRTF). The growth factors used in this assessment are 1.064 for the period 2008 to 2014 and 1.053 for the period between 2009 and 2014.

Earlsgate 2 Development

- 18.4.11 FC has requested that the TS consider the Earlsgate 2 Proposals as a committed development, and therefore agreed traffic generation and distribution information for this proposed development have been provided by FC and this data has been factored into the calculations undertaken within the TS.

18.5 Potential Impacts

Introduction

- 18.5.1 This section provides a summary of the potential impacts of the proposed development, based on an assessment of activities that will occur during construction and operation of the proposed Grangemouth Renewable Energy Plant, prior to the inclusion of mitigation measures.
- 18.5.2 An assessment of these potential impacts determines the need for mitigation measures, which are discussed in detail within Section 18.6. Therefore, this section does not necessarily reflect the real effects of the development. The actual effects (residual effects) of the development are outlined in Section 18.7.

Construction Phase

Traffic Impacts

- 18.5.3 The most onerous phase of the development in traffic terms is during the construction phase, with traffic being generated by construction staff, civil and mechanical works traffic and AIL.

Construction Staff Vehicle Movements

- 18.5.4 It is expected that the construction programme will commence in 2012 and last for a duration of 36 months. Throughout the programme, an average of 300 construction staff will be employed on site and the number of staff will peak at a level of 500 in month 26 in 2014 when the highest numbers of construction and commissioning staff will be on site.
- 18.5.5 The Construction site will operate on a single day-shift system, Monday – Saturday, between 0700 to 1800 hours, (comprising a 10 hour shift plus a 1 hour break). Parking for construction staff vehicles will be provided entirely within the Port of Grangemouth secure port estate.
- 18.5.6 Based upon the agreed methodology described within the TS, the weekday construction shift is likely to generate 234 arrivals and 234 departures.
- 18.5.7 If uncontrolled traffic movements throughout the Grangemouth road system could cause an impact on local traffic levels, particularly if allowed to enter the town centre.

Civil, Mechanical and AIL Traffic Movements

- 18.5.8 The other traffic associated with the construction phase of the project will originate from civil and mechanical works traffic and AIL.
- 18.5.9 A total of 66 HGVs and Light Goods Vehicles (LGVs) are likely to visit the construction site on a daily basis. This equates to a volume of 6 vehicular trips (one-way) per hour. If these vehicular movements were to be uncontrolled with respect to the time at which they arrived at, or left the site, this could cause a slight impact with regard to traffic flow.
- 18.5.10 Abnormal Indivisible Loads (AIL) are expected to arrive almost exclusively by sea, however in the event that there is a road-borne AIL requirement, the routing along the M9 Motorway and the A904 Falkirk Road / Earls Road will be agreed in advance with Transport Scotland, FC and the Police, as per accepted procedure.
- 18.5.11 As the majority of the plant machinery that is likely to be classed as AIL will be manufactured overseas, it is likely that the majority of these deliveries will be delivered via ship to the Port of Grangemouth and transferred to the site through the Port's operational area. Should some of these deliveries arrive at the site via the highway network, and travel during the network peak hours, they would have a moderate impact on local traffic flows in terms of delay for the period of time in which the AIL vehicles were on the highway network.
- 18.5.12 Table 18.2 illustrates the likely increases in flow on all links on the highway network of interest during the agreed traffic scenario period for the construction phase, i.e. the peak traffic flows in 2014 associated with 500 construction staff. All figures are one-way.

Table 18.2 Comparison of Base Flow Vs Assessment Flow for AM and PM periods

| Link | 2014 Network Peak Base Flow (AM/PM) | 2014 Construction Peak Base Flow (AM/PM) | 2014 Construction Peak Base + Assessment Flow (AM/PM) | Numerical Increase (AM/PM) | Percentage Increase (AM/PM) |
|-------------------------------|-------------------------------------|--|---|----------------------------|-----------------------------|
| North Shore Rd (Southbound) | 130 / 334 | 99 / 223 | 99 / 467 | 0 / 244 | 0% / 105% |
| North Shore Rd (Northbound) | 245 / 110 | 187 / 76 | 421 / 76 | 234 / 0 | 125% / 0% |
| Earls Rd (Southbound) | 588 / 718 | 455 / 503 | 455 / 669 | 0 / 166 | 0% / 33% |
| Earls Rd (Northbound) | 312 / 346 | 243 / 249 | 364 / 249 | 121 / 0 | 50% / 0% |
| Station Rd (Eastbound) | 555 / 707 | 426 / 501 | 426 / 559 | 0 / 58 | 0% / 12% |
| Stations Rd (Westbound) | 523 / 675 | 405 / 472 | 463 / 472 | 58 / 0 | 14% / 0% |
| South Bridge St (Westbound) | 224 / 376 | 172 / 263 | 172 / 273 | 0 / 10 | 0% / 4% |
| South Bridge St (Eastbound) | 636 / 466 | 485 / 326 | 540 / 326 | 55 / 0 | 11% / 0% |
| Glensburgh Rd (Northbound) | 556 / 1427 | 255 / 1074 | 255 / 1074 | 0 / 0 | 0% / 0% |
| Glensburgh Rd (Southbound) | 1273 / 839 | 589 / 630 | 634 / 630 | 45 / 0 | 8% / 0% |
| Falkirk Rd (Southbound) | 1352 / 1127 | 731 / 815 | 731 / 868 | 0 / 53 | 0% / 7% |
| Falkirk Rd (Northbound) | 1102 / 1366 | 618 / 968 | 671 / 968 | 53 / 0 | 9% / 0% |
| Beancross Rd (J6) (Eastbound) | 491 / 758 | 269 / 555 | 269 / 623 | 0 / 68 | 0% / 12% |
| Beancross Rd (J6) (Westbound) | 931 / 863 | 535 / 613 | 603 / 613 | 68 / 0 | 13% / 0% |
| Beancross Rd (J5) (Eastbound) | 1135 / 1039 | 418 / 760 | 418 / 828 | 0 / 68 | 0% / 9% |
| Beancross Rd (J5) (Westbound) | 540 / 555 | 243 / 400 | 311 / 400 | 68 / 0 | 28% / 0% |

*Note 5 increases noted in bold text indicate that the percentage increase exceeds the threshold for a slight impact.

- 18.5.13 Assessments of these junctions associated with these links (as described in the TS, Volume 4) show that no issues are predicted for the junctions on the network of interest for the flow scenarios examined. These results are to be expected given that construction worker traffic will be travelling on the network between the period 0600 to 0700 hours and 1800 to 1900 hours when background traffic flows are significantly lower than during the network peak hours.

Severance

- 18.5.14 Severance refers to the level of crossing difficulty for pedestrians, which may be caused by the introduction of additional traffic. The threshold for assessing severance given in EART¹ is that a 30% increase in traffic will result in a slight (as previously defined) severance impact, a moderate impact is where a 60% increase in baseline traffic and short term mitigation is required and a major impact is defined as an impact leading to a serious and lasting disruption, a 90% increase in baseline traffic and where permanent mitigation measures are required. The increases in traffic on some of the links do not reach the threshold for a slight impact and therefore the impact would be insignificant. However, the threshold for a slight or a moderate impact is exceeded on the following links:

- North Shore Rd (Southbound) - 105% (PM only);

- North Shore Rd (Northbound) - 125 % (AM only);
- Earls Rd (Southbound) - 33 % (PM only);
- Earls Rd (Northbound) 50 % (AM only).

18.5.15 These impacts are temporary and will be short lived. In the case of North Shore Road, although the increase in traffic is above the threshold which suggests a severance impact, the majority of this link is within the Port of Grangemouth estate and has a very low traffic flow. As such, the predicted increase is not representative of the actual severance impact, which will be negligible. There are also very few pedestrians on North Shore Road as most of the route is a private road serving the Port Estate. In addition, Earls Road is within an industrial area and is not anticipated to have a high number of pedestrians and therefore there is not expected to be a significant severance impact.

18.5.16 The AM and PM peak hours for construction traffic are outside of the peak hours for network traffic. As the combination of construction traffic and background traffic is less than the background traffic during the network peak hours there will be no noticeable effects on pedestrian severance over that currently experienced.

Accidents and Road Safety

18.5.17 The main impacts on road safety during the construction phase are likely to occur during the movement of construction staff, civil and mechanical works traffic and AIL, if moved by road. This is because of the volume of vehicles associated with construction staff arriving at and leaving the site, and the size and speed of vehicles involved with AIL movements and their potential hindrance to other road users resulting in an increased potential for accidents and delays.

18.5.18 The risk is increased with AIL, because of the road space taken up and differences in speed between vehicles. Vehicles travelling at lower than ambient speeds can lead to driver frustration and risk taking is more likely to occur. The potential impact of accidents and road safety is considered to be moderate.

Driver Delay

18.5.19 Due to the extremely low hourly increases in traffic associated with civil and mechanical works vehicles, it is unlikely that this increase would be detectable in the day to day variations in traffic flow.

18.5.20 Any AIL movements moving along the local highway network may cause localised delays. AIL movements would be temporary in nature and of a short duration. If they were to occur during the peak network hours, then the impact of delay on other drivers could be moderate although temporary in nature.

Pedestrian Amenity, Fear and Intimidation

18.5.21 Pedestrian amenity, fear and intimidation are affected by traffic flow, traffic composition, footway width and its separation away from the carriageway.

18.5.22 There is a good standard of footway provision on the roads surrounding the Port of Grangemouth and within the adjacent areas. Routeing agreements will be put in place to ensure that Renewable Energy Plant traffic avoids the A905 Beancross Road corridor, or adjacent residential areas. Therefore, the small numbers of vehicles added as a consequence of the redevelopment works are unlikely to have a significant impact upon pedestrian amenity, fear and intimidation.

Operational Phase

Traffic Impacts

18.5.23 Once operational, the Renewable Energy Plant will have a workforce of 40 staff. The 16 office based staff will normally be on site between 0800-1700 hours on weekdays, with a complement of operational, maintenance, and fuels staff split over a seven-day shift pattern. This would equate to the following staff/shift profile:

- 0800-1700 = 24 staff;
- 1700-2400 = 4 staff;
- 2400-0800 = 4 staff.

18.5.24 For robustness of assessment, it has been agreed with the various highway authorities that 100% of staff will travel by private vehicle with no car sharing taking place. The following tables illustrate the vehicular increase to be expected as a result of the proposed facility during the arrival and departure hours of the traditional “day” shift (0800-1800 hours): `1

Table 18.3: Operational Phase Traffic (all figures are one-way)

| Time Period | Inbound | Outbound |
|-------------|---------|----------|
| 0700-0900 | 24 | 4 |
| 1600-1800 | 4 | 24 |

- 18.5.25 Owing to the modest number of staff travelling to site during the operational phase of the development, FC has agreed that a Travel Plan is not required for the proposed development.
- 18.5.26 The table shows the most onerous phase of the operational lifecycle, when during the “day” shift at start and finish times, there is likely to be an increase of 24 vehicular trips respectively. This equates to one every 3 to 4 minutes and as a result would be undetectable in the day to day variations in flow. Regardless of the fuel form to be used, it is anticipated that the majority will be delivered by ship. Notwithstanding this, it is also the intention to source some fuel locally and because of this it has been assumed in this assessment that 212,000 tonnes of fuel material could be delivered by road. Dependent upon fuel type, calorific value and times when fuel can be delivered two HGV trips per hour (one-way) would result. This volume of traffic will be undetectable within the daily variation in flow on the strategic road network.
- 18.5.27 Approximately 20,000 tonnes of ash from the plant will be exported from the site by road or ship, however, if all were to be transported by road this would equate to three HGV movements per day (one-way). This volume of traffic will be undetectable within the daily variation in flow on the strategic road network.
- 18.5.28 In addition to biomass deliveries and ash removal, it is expected that up to 170 deliveries of fuel oil, resulting in 3 vehicles per week and between 224 deliveries of flue gas treatment reagents resulting in 4-5 deliveries per week. These volumes of traffic will be undetectable within the daily variation in flow on the strategic road network.
- 18.5.29 It is deemed that severance, accidents and road safety, driver delay and pedestrian amenity, fear and intimidation are all insignificant due to the low volumes of traffic being generated during the operational phase of the development.

18.6 Mitigation

Construction Phase

Traffic Impacts

- 18.6.1 All civil and mechanical works traffic will access the site between 0700-1800 hours Monday to Saturday and will be spread out evenly during this period.
- 18.6.2 The proposed civil and mechanical construction traffic and operational biomass / maintenance delivery routes have been discussed with the consultees and are shown in Figure 18.1. All construction civil and mechanical works traffic will access the site via the M9 Motorway and the A904 Falkirk Road / Earls Road and avoid the use of the A905 Beancross Road corridor and roads within the adjacent residential areas.

- 18.6.3 Police and abnormal loads escorts will be used, and loads will be transported by specialist haulage contractors in accordance with 'The Road Vehicles (Authorisation Type) (General) Order 2003' (STGO) regulations and special orders granted from the Department for Transport.
- 18.6.4 All impacts relating to construction traffic will be short term and temporary in nature. The likely changes in traffic flows on the immediate highway network are not predicted to be significant. However, the types of vehicles, their routing to and from the development site and the hours of operation will be sensitive. Therefore, in order to minimise these impacts, a detailed Construction Transport Management Plan will be prepared and submitted to FC and Transport Scotland prior to the commencement of the construction phase.

Severance

- 18.6.5 No mitigation is required with respect to severance.

Accidents, Road Safety and Driver Delay

- 18.6.6 Routing agreements will be put in place to ensure that Renewable Energy Plant traffic avoids the A905 Beancross Road corridor, or adjacent residential areas. It is intended that the proposed route will form the basis for the Construction Traffic Management Plan and Freight Management Plan for the operational phase.
- 18.6.7 The majority of AIL movements are expected to access the site through the Port of Grangemouth via ship and then travel through the port's operational area. If any AIL movements need to access the site via the strategic and surrounding local highway network, then these will occur during the night-time hours when background traffic on the network is at its lowest, so as to reduce the risks of conflicts with other road users. These AIL movements will have the prior written agreement of FC, Transport Scotland and the relevant Police Authorities that may be affected by the vehicle movements.
- 18.6.8 It is intended that the proposed route will form the basis for the Construction Traffic Management Plan.
- 18.6.9 All traffic movements associated with construction worker vehicles accessing the site will occur between 0600 - 0700 hours and 1800 - 1900 hours, which are outside of the network peak hours.

Pedestrian Amenity, Fear and Intimidation

- 18.6.10 All traffic associated with civil and mechanical works will travel only on dedicated routes to and from the site regardless of origin or destination. The route restricts traffic to key trunk roads where it is expected that pedestrian usage is more infrequent than other possible routes and therefore pedestrian amenity, fear and intimidation will be minimised.

Operational Phase

- 18.6.11 All HGV traffic will access the site via the M9 Motorway and the A904 Falkirk Road / Earls Road and avoid the use of the A905 Beancross Road corridor and roads within the adjacent residential areas.
- 18.6.12 No additional mitigation works are required for the operational phase.

18.7 Assessment of Residual Effects**Construction Phase****Traffic Impacts**

- 18.7.1 The arrival and departure of construction staff will have little detrimental effect upon the environment as this will be outside of the peak hours. Therefore the impact of construction worker traffic is considered to be insignificant.
- 18.7.2 As some construction staff originating in the local area may, in reality, utilise local public transport services to access the site, the methodology used as part of the TS, assuming that employees will travel to and from the site by personal car results in a robust assessment of traffic generation.

- 18.7.3 It is anticipated that the majority of AIL will be delivered via ship to the Port of Grangemouth. However, in the event that any AIL travels to site by road this would have the potential to cause inconvenience due to the nature of the vehicles, their loads, resultant speeds and manoeuvrability characteristics. The small number of AIL movements will only be very short term in nature, and with the proposed mitigation in place no significant residual impacts will occur.

Severance

- 18.7.4 The increases in traffic at the majority of the junctions considered are less than 30% of existing flows. However, on four of the junction links, the increase in traffic exceeds this threshold although, due the low numbers of pedestrians likely to be present within this area the impacts are considered to be insignificant.

Accidents and Road Safety

- 18.7.5 The vast majority of the AIL for the Renewable Energy Plant will arrive by sea and be transported to the construction site via the Port of Grangemouth secure port estate internal road network. Should any AIL be delivered by the Strategic Road Network then this may cause localised delays, but these delays will be temporary, of short duration, and will be travelling when background traffic flows are extremely low. The residual effect is considered to be slight.

Driver Delay

- 18.7.6 Due to the extremely low hourly increases in traffic associated with civil and mechanical works traffic and as construction staff traffic will be travelling to the site outside of the advised network peak hours when background traffic flows are lower, it is not predicted that this traffic associated with the construction phase of the project will cause any notable increase in delay on the surrounding local highway network during the morning or evening. Operational assessments undertaken as part of the TS confirm that no capacity issues on the highway network of interest are expected within the junctions assessed and links between the area of investigation. Therefore, the residual effects of the project on driver delay will be insignificant.
- 18.7.7 The residual effects of driver delay from AIL movements will also be insignificant.

Pedestrian Amenity, Fear and Intimidation

- 18.7.8 Due to the site's location, pedestrian activity in the location is low; the residual effect on pedestrian amenity, fear and intimidation is therefore considered to be insignificant.

Operational Phase**Traffic Impacts**

- 18.7.9 The volume of traffic associated with operational staff during the most onerous times i.e. the start and finish of the "day shift" (0800-1700 hours), is akin to one vehicle movement every 2 to 3 minutes for the hour preceding and post shift. Therefore, such levels are concluded to be insignificant.
- 18.7.10 In addition, all deliveries of fuel, removal of ash and maintenance vehicles add a very small number of additional vehicles to the road network and therefore do not constitute a significant impact.

Severance, Accidents and Road Safety, Driver Delay, Pedestrian Amenity, Fear and Intimidation

- 18.7.11 With regards to impacts associated with severance, accidents and road safety, driver delay and pedestrian amenity, fear and intimidation; it can be summarised that due to the small numbers of operational staff and their associated vehicular trips to and from the site that when considered against the listed criteria, all impacts will be insignificant.

18.8 Cumulative Impacts

- 18.8.1 FC and Transport Scotland have confirmed that the Earlsgate 2 Proposals should be considered as a committed development which should be taken into consideration as part of this assessment. Therefore the data provided by FC for this scheme was incorporated into the TS for this site and the cumulative impacts of this and Grangemouth REP was considered to be insignificant.

18.9 Summary of Residual Effects

- 18.9.1 Table 18.4 illustrates a summary of the predicted residual effects from traffic from the proposed facility.

Table 18.4: Summary of Effects

| Potential effect | Mitigation | Residual effect |
|--|---|-----------------|
| Construction | | |
| Traffic Impact | None | Not significant |
| Severance | None | Not significant |
| Accidents and Road Safety | Police + Abnormal Loads Escorts for AIL Movements (if required) | Not significant |
| Driver Delay | None | Not significant |
| Pedestrian Amenity, Fear and Intimidation | None | Not significant |
| Operation | | |
| Traffic Impact | Dedicated and agreed delivery routes for HGVs and Freight Management Plan | Not significant |
| Severance | None | Not significant |
| Accidents and Road Safety | None | Not significant |
| Driver Delay | None | Not significant |
| Pedestrian Amenity, Fear and Intimidation | None | Not significant |
| Decommissioning | | |
| As per construction phase – less AIL Movements | None | Not significant |

18.10 Summary and Conclusions

- 18.10.1 The proposed transport routes, access arrangements, estimated traffic volumes and potential environmental effects of traffic during construction, operation and decommissioning of the proposed Renewable Energy Plant are addressed within the ES. In addition a detailed Transport Statement (TS) has been prepared (Volume 4).
- 18.10.2 Discussions have been held with Falkirk Council Transport Division and Transport Scotland regarding the assessment methodology, significance criteria and baseline conditions.
- 18.10.3 The proposed civil and mechanical construction traffic and operational biomass / maintenance delivery routes have been discussed and agreed with the consultees. Laden construction vehicles and biomass deliveries would approach the site from the east via Junction 5 of the M9 Motorway and travel via the A9 and A904 to access the Port of Grangemouth via North Shore Road and the A904 Earls Road / Station Road roundabout. Vehicles will then travel onto Central Dock Road to access the site. Traffic approaching from the west would utilise Junction 6 of the M9 Motorway and join the A904 Earls Road via the A905 Glensburgh Road.
- 18.10.4 Empty vehicles would exit the site travelling back along North Shore Road and exit the Port of Grangemouth through the A904 Earls Road / Station Road roundabout and onto Junction 6 of the M9 Motorway. Vehicles travelling westbound can join the M9 Motorway at this junction whereas vehicles travelling eastbound will continue onto Falkirk Road and travel via the A9 Laurieston Bypass to Junction 5 of the M9 Motorway. These HGV routes follow established significant routes which are considered to be appropriate for HGV movements.

- 18.10.5 It is expected that the majority of abnormal loads during construction will be delivered by sea and therefore there will be no effect on the local road network. Even if abnormal loads need to be delivered by road it is expected that with deliveries restricted to night time, and with police escorts, the effects on road users would be minimal and not significant.
- 18.10.6 During the peak of the construction phase (2014 with 500 construction staff), there are predicted to be pedestrian severance (i.e. difficulty of road crossing) issues on some roads based on the criteria in guidance produced by the Institute of Environmental Assessment (The Environmental Assessment of Road Traffic). However, there are barriers to pedestrian activity along the specified access routes.
- 18.10.7 The AM and PM peak hours for construction traffic are outside of the peak hours for network traffic, as the combination of construction traffic and background traffic is less than the background traffic during the network peak hours, there will be no noticeable effects on pedestrian severance over that currently experienced.
- 18.10.8 All other impacts during construction, including accidents and road safety, driver delay, and pedestrian amenity, fear and intimidation are also predicted to be insignificant.
- 18.10.9 The majority of fuel will be delivered by ship to the Renewable Energy Plant. However, it is the intention to deliver up to 212,000 tonnes of locally sourced fuel by road. It is also possible that some of this could be delivered by ship. The TS provides details of the HGV movements this volume of material will generate, but the numbers equate to no more than 2 HGV movements each way every hour. The TS concluded that there is capacity on the local road network to take this increase plus other maintenance vehicles and deliveries.
- 18.10.10 There will be 40 staff working at the plant once operational. A shift working system will be in operation. The TS assessed the impact of these workers arriving to site by road. It concluded that there would be no significant impact on the road network.
- 18.10.11 Due to the low levels of vehicle movements during the operational phase of the plant the ES does not predicted any significant effects on accidents and road safety, driver delay, pedestrian severance and pedestrian amenity, fear and intimidation.
- 18.10.12 No cumulative environmental effects of the proposals are predicted due to the Earlsgate 2 proposals.
- 18.10.13 All effects associated with decommissioning traffic are also considered to be insignificant.

Abbreviations

The following is a list of abbreviations adopted in Chapter 18 Traffic and Transport.

| | |
|-------------|--|
| AIL | Abnormal Indivisible Loads |
| FC | Falkirk Council |
| HGV | Heavy goods vehicle |
| LGV | Light goods vehicle |
| Mph | Miles per hour |
| NRTF | National Road Traffic Forecasts |
| SEPA | Scottish Environmental Protection Agency |
| TS | Transport Statement |

Chapter 19

Pollution Prevention

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19 Pollution Prevention

19.1 Introduction

19.1.1 This Chapter presents a statement of how pollution prevention will be addressed for the Grangemouth Renewable Energy Plant. It provides a summary of pollution prevention mitigation measures which have been outlined throughout the Environmental Statement (ES) for a range of environmental topics. This Chapter also provides an overview of how pollution prevention will be implemented and managed to ensure that it is effective throughout the construction, operation and decommissioning of the project.

19.1.2 This chapter draws on mitigation measures identified in each of the following technical Chapters of this ES:

- Emissions to Air Chapter 9: Air Quality
- Environmental nuisances Chapter 11: Noise and Vibration;
- Nuisance and emissions from traffic and transport Chapter 18: Traffic, Transport and Access
- Emissions to water Chapter 14: Hydrology, Hydrogeology, Geology and Soils and Chapter 13 Aquatic Ecology.

19.2 Approach to pollution prevention mitigation

19.2.1 The approach to mitigation is based on a good practice approach to mitigation as outlined within Section 8.7 of this ES. In summary this describes a hierarchical approach to mitigation based on the following principle:

- Avoidance – through design or avoidance of areas impacts are avoided;
- Prevention – adopt measures to reduce the likelihood of there being significant adverse effects;
- Compensation or offset – where it is not possible to reduce the severity of predicted effect measures are proposed to compensate or offset the effects; and
- Enhancement – It is sometimes possible within a development footprint to identify enhancement measures to create positive outcomes from a proposed development. There are no enhancement opportunities currently identified as there are no known pollution problems with the development site.

19.2.2 A summary of the mitigation measures proposed by this development are outlined within Table 19.1. It summarises the key issues addressed by the ES and identifies the major areas of mitigation proposed under each topic relevant to the development of an EMP. It also provides a summary of the purpose of the mitigation proposed in the context of the approach to mitigation outlined in the above paragraph. Further details and context is provided in the individual assessment chapters, which are highlighted above in paragraph 19.1.2.

19.2.3 Mitigation has also been applied to each of the development phases of the project, as follows:

- mitigation to be incorporated into the development proposals;
- mitigation through controls on demolition / decommissioning and construction activities; and
- mitigation to be applied through on-going management and monitoring once development commences (operational period).

19.2.4 Each of these categories is further described in the following sections of this chapter.

Mitigation incorporated into the proposals

- 19.2.5 The EIA process works most effectively where it forms an integral part of the project design. In doing so, there is an opportunity to influence the decision-making such that negative environmental effects can be avoided or minimised and opportunities for environmental gain or enhancement can be fully exploited.
- 19.2.6 The EIA project team have worked closely with the design team to achieve an iterative design process where one team responds to the emerging work of the other. Site selection studies, based on pre-feasibility work as described in Chapter 7, has also contributed to the mitigation of effects. Through these studies it has been possible to avoid those sites with the highest number of effects or effects which at the time had the potential to be significant. The result has been the selection of a site with the fewest number of effects to mitigate. Table 19.1 outlines where mitigation measures have been incorporated into the design proposals.

Mitigation during construction

- 19.2.7 The responsibility for minimising the effects of construction will fall upon the Applicant and Principal Contractor. In order to reduce the potential impacts a suitable Construction EMP will be developed for the Proposed Development and agreed with the relevant authorities (including Falkirk Council, SEPA, SNH and the Scottish Government).

Mitigation through Operational management

- 19.2.8 Many of the pollution prevention mitigation measures identified throughout the ES rely on effective implementation and ongoing maintenance and monitoring once the development process commences. The precise management structures for controlling these activities and ensuring that impacts are minimised are yet to be determined. However the Applicant will ensure that appropriate procedures and responsibilities are in place.

Table 19.1: Proposed Required Pollution Prevention Mitigation Measures

| Topic Area | Proposed Mitigation | Type of Mitigation | Implementation |
|--------------------|--|--|---|
| Air Quality | <p>Construction Period</p> <ul style="list-style-type: none"> Design and use of all plant and equipment in a manner which minimises dust generation; Water spray dampening of soils and spoil may be undertaken to prevent dust blow during hot, dry weather conditions; Careful location, grading and management of stockpiles of soil and similar materials will be undertaken to prevent wind-blow; Sealing and / or re-vegetation of completed earthworks will be undertaken as soon as reasonably practicable; Surfacing of site roads early in the construction programme; Limiting of vehicle speeds to less than 20 mph on un-surfaced areas of the site; Sheeting of Lorries during transportation of friable construction materials and spoil; Drop heights will be minimised during material transfer activities, such as unloading of friable materials; Regular cleaning of surfaced roads and maintenance of un-surfaced roads will be undertaken to reduce off-site transport of soils and to avoid dust generation; Provision of wheel washing facilities for heavy commercial vehicles and any other vehicle which has an operating weight exceeding three tonnes entering the public road system; Positioning and movement of construction equipment will be undertaken in a manner which minimises dust generation; Regular monitoring will be undertaken in accordance with the guidelines set out in Technical Guidance LAQM TG(09)¹ to ensure fugitive dust emissions are controlled to acceptable levels; and Monitoring will enable the identification of elevated local concentrations and the need for additional preventative measures to be actioned. | <p><i>Construction period mitigation is largely preventative, with a degree of monitoring needed to ensure the continued effectiveness of the measures implemented</i></p> | <p><i>Implementation will be through the EMP, which will outline a series of method statements for many of the mitigation activities outlined. The role of continual auditing will be key to ensure mitigation remains effective. This will be a planning condition requirement</i></p> |

¹ Part IV of the Environment Act 1995 Local Air Quality Management Technical Guidance LAQM TG(03), DEFRA, 2003

| Topic Area | Proposed Mitigation | Type of Mitigation | Implementation |
|------------|---|--|---|
| | <p>Operational Period</p> <ul style="list-style-type: none"> • Employment of the Best Available Technology (BAT) for the combustion of biomass i.e. FB technology; • Use of a low-chloride, low-ash, fuel (i.e. biomass and light fuel oil); • Use of a low-sulphur fuel, (i.e. biomass and light fuel oil); • Use of activated carbon to control heavy metals and dioxins and furans, when necessary; • Use of lime injection to control acid gases when necessary; • Selective Non Catalytic Reduction (SNCR) to control the generation of NOx emissions when necessary; • Stacks will be appropriately designed to ensure adequate dispersion of emissions to atmosphere; • Utilisation of a high efficiency dust collection system (fabric-filters) to control emissions of particulates; • Use of effective combustion control to limit carbon monoxide emissions; • Enclosed storage of fuels which may generate fugitive dust emissions to reduce the potential for wind-blown dust; • Storage of ash in an enclosed silo; • Sheeting of lorries during transportation of friable materials; • Dust suppression systems for the external fuel delivery, processing and storage areas, including enclosed conveyors; • Fitting the main FB boiler stack with Continuous Emissions Monitors to monitor the emissions of pollutants in accordance with the Waste Incineration Directive; and • Adoption of a comprehensive fire prevention and safety system to minimise the risk of fire from the fuel store area. <p>Decommissioning Period</p> <ul style="list-style-type: none"> • Production of a site closure plan and submission to SEPA prior to the start of decommissioning and in accordance with environmental controls relevant at the time to include a range of mitigation measures similar to those noted above for the construction phase. | <p><i>Operational mitigation is largely driven through achieving the right design and therefore reflects a combination of avoidance and preventative mitigation</i></p> <p><i>Mitigation for this phase reflects preventative measures</i></p> | <p><i>Much of the design controlling air quality impacts will be driven by the detailed design agreed at the permitting phase.</i></p> <p><i>Planning condition requirement</i></p> |

| Topic Area | Proposed Mitigation | Type of Mitigation | Implementation |
|---------------------|---|---|--|
| Noise and Vibration | <p>Construction and Demolition Period</p> <ul style="list-style-type: none"> The Contractor will ensure that all works will be completed in accordance with the guidelines provided in BS5228; Adequate silencing of any equipment requiring overnight operation (e.g. pumps, generators and compressors) to ensure that noise from the equipment shall not exceed the night-time limits in Annex E of BS 5228-1, of 45 Laeq. (Overnight laying up of vehicles is not anticipated); Confining of activities such as steam purging to less sensitive daytime periods to minimise the risk of complaint; Fitting of temporary attenuators to commissioning vents, if necessary; Travel of any abnormal loads, heavy equipment and the majority of construction materials on road vehicles outside of the peak traffic hours on signed HGV routes to minimise noise impact; and HGV route to form part of the construction management plan. <p>Operational Period</p> <p><u>Acoustic design</u></p> <ul style="list-style-type: none"> Substantial acoustic design input at the detailed design stage of the development; Detailed simulation of environmental noise to the community will be undertaken using acoustic data from the finally selected equipment and superstructure suppliers; Modelling of equipment and plant noise sources to predict total noise levels at community locations; Checking of total noise levels to ensure they remain consistent with values predicted in this ES; and Consideration of the Rating Levels presented in BS4142:1997 (at residential properties) as suitable for incorporation within a planning condition, as a suitable basis for protecting residential amenity. <p><u>Intermittent Noise</u></p> <ul style="list-style-type: none"> Adoption of design measures to control intermittent noise sources, with particular attention given to atmospheric vent silencers and acoustic lagging of external noisy steam pipes and valves; and Setting of noise control measures to achieve a limit of normal operating predicted | <p><i>Mitigation for this phase reflects preventative measures</i></p> | <p><i>Managed through planning conditions with sign off from Environmental Protection at Falkirk Council</i></p> |
| | | <p><i>Mitigation is based on avoidance through design</i></p> | <p><i>Design requirements will be based on conditioned noise levels</i></p> |
| | | <p><i>Mainly mitigation through avoidance by appropriate design</i></p> | <p><i>Based on planning condition requirements</i></p> |

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| Topic Area | Proposed Mitigation | Type of Mitigation | Implementation |
|------------|---|---|--|
| | <p>to the stack;</p> <p>6) Housing of the ID fan and motor drive within an acoustic enclosure or similar building with silenced ventilation;</p> <p>7) Use of standard industrial buildings for the fuel storage buildings or silos except where the detailed design requires buildings closer to sensitive receptors to have acoustic enhancements;</p> <p>8) Enclosure of all horizontal and inclined belt conveyors within a panelled structure, with the detailed design informing the acoustic performance ratings required. It is likely that some units close to residential receptors will need to have a high acoustic performance characteristic with the panels vibration isolated from their support structure to further enhance sound insulation;</p> <p>9) An enclosed vertical bucket elevator, with the detailed design informing the acoustic performance rating required;</p> <p>10) Generator finfan cooler will be fitted with low speed /low noise fans;</p> <p>11) Steam vents and emergency steam relief valves to be fitted with vent silencers;</p> <p>12) Lagging of steam pipes and control valves;</p> <p>13) Location of compressed air plant within a building or acoustic enclosure; and</p> <p>14) Cooling towers will be fitted with low noise, aerodynamically efficient, fans.</p> <p><u>Commissioning Noise Survey</u></p> <ul style="list-style-type: none"> A series of measurements will be carried out at the same locations used in this assessment (together with any other agreed reference locations) after the commissioning phase to monitor the Renewable Energy Plant operating at normal commercial capacity, in order to demonstrate compliance with the design noise objectives. <p><u>HGV Routing</u></p> <ul style="list-style-type: none"> The route on public roads for HGV vehicles to be via the M9 Motorway and the A904 Falkirk Road / Earls Road, avoiding the use of the A905 Beancross Road corridor and roads within the adjacent residential areas to minimise the potential for noise impacts on sensitive receptors. | <p><i>Confirmation of the avoidance measures, but providing the opportunity to apply further preventative mitigation</i></p> <p><i>Preventative measure</i></p> | <p><i>Based on planning condition requirements and therefore requiring sign off from Falkirk Council</i></p> <p><i>EMP commitment by the Applicant</i></p> |

| Topic Area | Proposed Mitigation | Type of Mitigation | Implementation |
|--|---|--|---|
| Hydrology, Hydrogeology, Geology and Soils | <p>Construction Phase</p> <p><u>Earth Works</u></p> <ul style="list-style-type: none"> Contractors will be required to prepare and adhere to a Sediment Control Plan (part of Environmental Management Plan) throughout the construction process outlining routine working and emergency procedures; Backacters and dump trucks will be used for soil excavations and movements; Soil excavations to be carried out during dry weather, where possible; Re-use of soil for restoring excavations, where possible; Topsoil and subsoil to be excavated and stored separately, if applicable; Minimal soil resources to be excavated and transported off-site; Risk assessments and a remediation strategy will be prepared outlining the treatment and re-use of materials; Contractor will be required to prepare detailed method statements on how materials are to be dealt with; A Site Waste Management Plant (SWMP) will be required detailing how all materials generated at the site will be dealt with; and Chemical testing of any soils imported to the site will be required to ensure compliance with the remediation strategy and in agreement with SEPA and Falkirk Council. | Measures described are essentially preventative measures | Measures to be formalised with the EMP |
| | <p><u>Foundation Formation</u></p> <ul style="list-style-type: none"> Piling works will be undertaken with reference to appropriate guidance on the protection of groundwater during piling works. The relevant guidance in Scotland was produced by the Environment Agency²; Concrete will be batched on site within a designated construction laydown area; To avoid the potential for leaching, the appropriate classification of concrete for the environmental conditions will be used; A risk appraisal will be carried out on the risks posed to groundwater quality in the | Preventative mitigation measures | Implemented through the EMP, and detailed design of any piling works with agreement from SEPA |

² Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention (Environment Agency 2001).

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| Topic Area | Proposed Mitigation | Type of Mitigation | Implementation |
|------------|---|---|--|
| | <ul style="list-style-type: none"> No pile driving will be undertaken during night time periods. When appropriate, non-metallic pads will be utilised between the hammer and the pile head driver to reduce noise. Consideration will be given to initial pile driving being undertaken by a 'silent method' e.g. hydraulic pressing or vibration. Percussive driving will be for no more than 6 hours per day but often less (3 to 4 hours). <p>Operation Phase</p> <ul style="list-style-type: none"> Storage of oil, sodium hypochlorite solution and chemicals for use in boiler water treatment will be away from the dock. Any oil spillage will drain to oil interceptors and any chemical spills will be directed to the site wastewater neutralisation sump where the effluent will be mixed and neutralised before discharge. In addition to the Harbour Authority's statutory requirement to have an approved oil spill response plan and the Port's requirement to similarly have an approved oil spill response plan in the event of water entering the dock or the estuary, the Plant will have in place an Environmental Management Plan that identifies procedures and activities to prevent and control spillage. A number of good practice mitigation measures will be employed with respect to the operation of the plant, in accordance with the relevant guidance. No enhancement or compensation is considered necessary. <p><u>Cooling Water Abstraction</u></p> <ul style="list-style-type: none"> Fish screens i.e. a wedge-wire screen, or equivalent system, with 3 mm spacing and minimising the approach velocity of water to the wedge-wire screen to a maximum of 0.2 m/s. <p><u>Cooling Water Discharge</u></p> <ul style="list-style-type: none"> Diffusers will be fitted to promote rapid mixing of the cooling water with the receiving water. The discharge will only occur on a falling tide. Cooling water make-up will be treated with the minimum amount of biocide required to control fouling and the growth of micro-organisms. | <p><i>Preventative measures</i></p> <p><i>Mitigation through avoidance in design</i></p> <p><i>Mitigation through avoidance in design</i></p> | <p><i>Implementation will be through the EMP</i></p> <p><i>Compliance managed through the PPC permit</i></p> <p><i>Compliance managed through the PPC permit</i></p> |

19.3 Site Environmental Management Philosophy

19.3.1 The environmental protection measures described within this report outline the frameworks around which an Environmental Management Plan will be developed. Forth Energy will work closely with the site contractor and any other sub-contractor to ensure that this EMP plan is developed into workable, manageable and auditable measures. Once drafted it would be agreed with the local authority and SEPA.

19.3.2 The measures proposed have been based on available good practice and guidance. Reference to such good practice will be made when developing method statements and management plans with the site contractor, who will be responsible for implementing EMP.

19.3.3 Good practice measures have been referred to in the ES and are further referred to in Table 19.1. However a summary of the good practice measures that mitigation refers to and which will be used in the development of detailed method statements and the EMP, are as follows:

- Prevention of pollution from Civil Engineering Contracts: Special Requirements. (SEPA 2006)
- Environment Alliance³ Pollution Prevention Guidance Notes (PPG);
 - PPG 1 General guide to the prevention of water pollution;
 - PPG2: Above ground oil storage tanks;
 - PPG3: Use and design of oil separators in surface water drainage systems;
 - PPG 5 Works in, near or liable to affect watercourses;
 - PPG 6 Working at construction and demolition sites;
 - PPG 8 Safe Storage and Disposal of Used Oils;
 - PPG 13 High Pressure Water and Steam Cleaners;
 - PPG 26 Storage and Handling of Drums and Intermediate Bulk Containers
- CIRIA Report C532 Control of Water Pollution from Construction Sites (2001);
- CIRIA Report C502 Environmental Good Practice on Site;
- BS 5228-1:2009 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise
- Rating Levels presented in BS4142:1997

19.3.4 The EMP will outline how the above mitigation measures will be implemented, in some cases in the form of detailed method statements. It will also contain the following elements critical to the success of the EMP:

³ Environmental Alliance comprises Environment Agency, Scottish Environment Protection Agency, Northern Ireland Environment Agency. The PPG guidance notes are jointly published and are relevant and appropriate to projects in Scotland.

- Roles and responsibilities of the developer, contractor, sub-contractors and visitors to the site;
- Training and awareness needs and requirements;
- Register of potential impacts and corresponding response measures;
- Environmental monitoring;
- Emergency response measures, particularly to address spills, leaks and abnormal occurrences;
- Useful contacts (e.g. SEPA, Environmental Protection at Falkirk Council, local waste contractors); and
- Reporting procedures.

19.3.5 Ongoing monitoring and auditing of the EMP would be undertaken by an on-site Environmental Manager to ensure compliance. Access will also be provided to SEPA and Falkirk Council for the purposes of site audits as required.

19.4 Summary

- 19.4.1 This Chapter outlines the measures to be adopted for a range of topic areas for the prevention of pollution from the proposed Grangemouth Renewable Energy Plant. It outlines the mitigation philosophy which has guided the development of the plant and the mitigation measures. Principally the mitigation philosophy is based on avoidance through design and site selection, followed by the introduction of preventative measures.
- 19.4.2 Table 19.1 outlines the measures proposed to be implemented for the control of pollution occurrences associated with emissions of air and noise, changes to the hydrology, hydrogeology and soils, and issues associated with changes in traffic.
- 19.4.3 The mitigation measures represent the output of the assessment of environmental effects for each of the topic areas described above. Table 19.1 begins to outline the mechanisms by which the mitigation will be implemented, outlining a combination of site EMP, planning condition requirements, and implementation through the regulation of the site as part of the PPC permit requirements.
- 19.4.4 This Chapter also outlines the approach to environmental management associated with the plant. An outline of the need to adhere to current industry practice and a framework for the content of the EMP is also presented. The EMP would be formalised and agreed with Falkirk Council and SEPA, with ongoing opportunities for regular auditing.

Abbreviations

The following is a list of abbreviations adopted in Chapter 19 Pollution Prevention.

| | |
|--------------|---|
| % | Per cent |
| AOD | Above ordnance datum |
| BS | British Standard |
| CAR | Controlled Authorised Regulation |
| CO | Carbon monoxide |
| dB(A) | Decibels, A-weighted |
| DEFRA | Department of Environment, Food and Rural Affairs |
| EIA | Environmental Impact Assessment |
| EMP | Environmental Management Plan |
| ES | Environmental Statement |
| FB | Fluidised bed |
| HGV | Heavy goods vehicle |
| ID | Induced draft |
| LAeq | Continuous sound pressure level over a given period |
| LAQM | Local Air Quality Management |
| m | Metre(s) |
| mph | Miles per hour |
| NOx | Oxides of nitrogen |
| PPC | Pollution Prevention and Control |
| SEPA | Scottish Environment Protection Agency |
| SNCR | Selective Non Catalytic Reduction |
| SNH | Scottish Natural Heritage |
| SWMP | Site Waste Management Plan |
| TG | Technical guidance |

Grangemouth Renewable Energy Plant

Figure 7.1

Alternative Sites

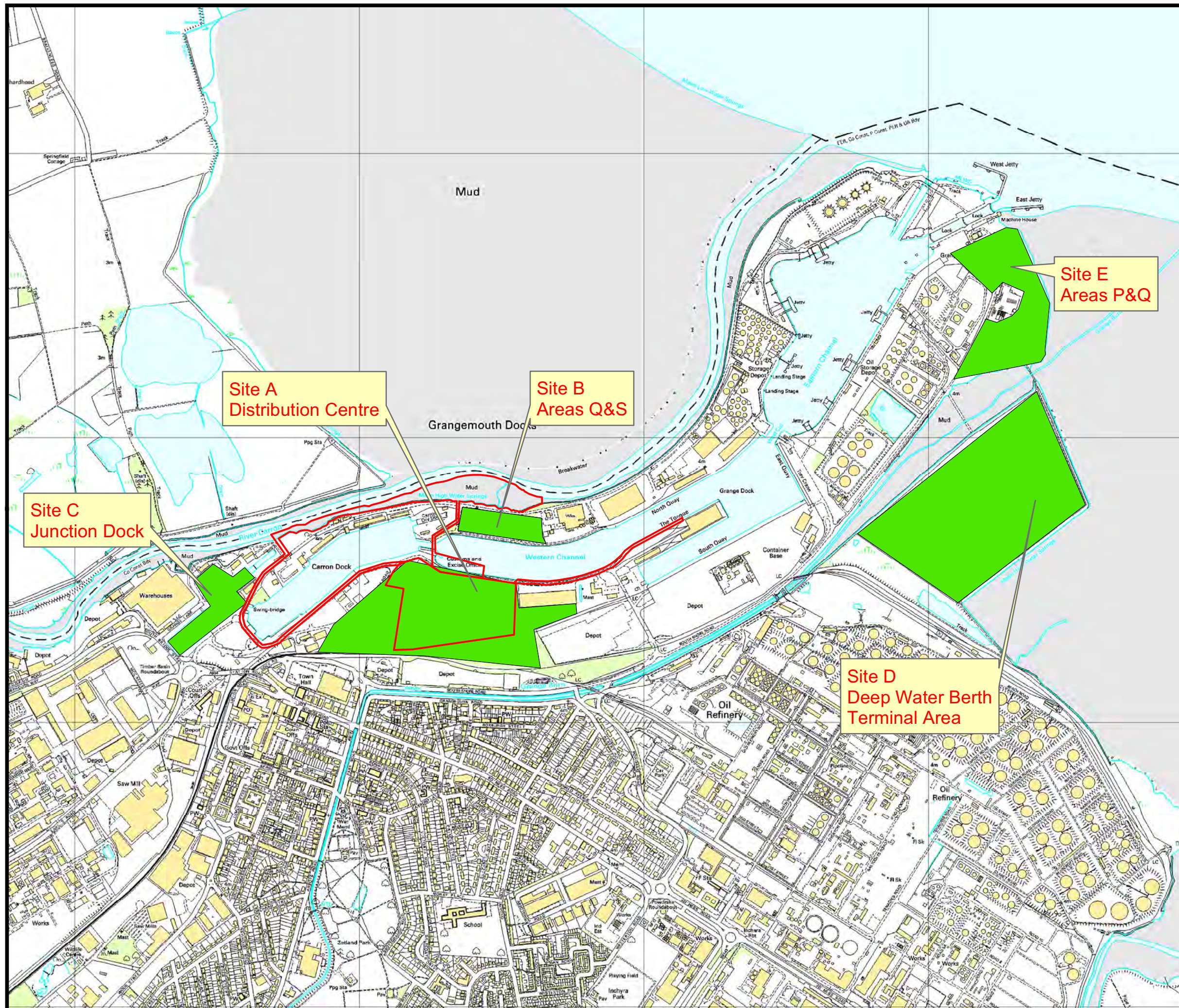
Legend

 Application Boundary

0 100 200 300 400 500
Metres

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SINCLAIR KNIGHT MERZ
SKM ENVIROS



Forth Energy

Grangemouth Renewable Energy Plant: Scoping Report *Addendum*

Forth Energy

Prepared by

Jones Lang LaSalle
and
Sinclair Knight Merz

March 2010

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1 Addendum

1.1 Background

- 1.1.1 Forth Energy is seeking consent under Section 36 of the Electricity Act 1989 to construct and operate the 120 Megawatt (MW) Grangemouth Renewable Energy Plant (REP), on a site at the Port of Grangemouth. On 18 December 2009 Forth Energy submitted a Scoping Report in support of a request for a scoping opinion relating to the Environmental Impact Assessment (EIA) of the proposed development. The Scottish Government Energy Consents Unit (SGECU) issued this report to all statutory and non-statutory consultees on 24 February 2010, thereby commencing the formal scoping period. Consultees are invited to provide a response on the content and approach to the preparation of the EIA as documented in the Scoping Report.
- 1.1.2 The SGECU has set a deadline for responses to the scoping process as 18 March 2010.

1.2 Need for an Addendum

- 1.2.1 Since the submission of the scoping request for the Grangemouth REP, Forth Energy has continued to develop its plans for the site. This has led to the identification of a number of site-specific factors which have resulted in the need to refine the site boundary, to ensure the best operational flow of the proposed plant and equipment.
- 1.2.2 The amendment to the site boundary does not result in any change to the description of the proposed development that the scoping request relates to.
- 1.2.3 This addendum to the scoping report identifies the revised site boundary (Figure 2 (Rev A) included at Appendix 1), and details consequent changes to the proposed approach to the EIA. This addendum is to be read in conjunction with the original Scoping Report dated December 2009. Figure 2 (Rev A) in Appendix 1 of this Addendum supersedes and replaces Figure 2 in that report.

1.3 Updated Site Description

- 1.3.1 The revised site is in the same broad locality as that originally proposed in the Scoping Report, and encompasses a significant amount of the original area. The revised boundary provides a more regular shaped site within which to accommodate the proposed REP and avoids the requirement to realign the Central Dock Road.
- 1.3.2 The revised site is located in an area adjacent to Carron Dock and the Western Channel, utilising an area of 10.34 ha, wholly located within the operational boundary of Grangemouth Docks. The site is bounded to the north by the Central Dock Road, to the south by the dock railway spur and an area of scrub grassland, and to the east and west by existing port facilities including storage buildings and areas of hardstanding. The site includes an area extending eastwards along the southern edge of the Western Channel towards 'The Tongue' of Grange Dock. This area is proposed to incorporate the alignment of a conveyor to transfer fuel from the quayside to the proposed REP. The revised site no longer includes the East Quay area to the east of the site.
- 1.3.3 The site comprises a mix of scrub grassland and existing port facilities including storage buildings, areas of hardstanding and areas for the stockpiling of materials.
- 1.3.4 Figure 2 (Rev A) also illustrates two indicative potential 'areas of search' extending into the Firth of Forth which are included to accommodate cooling water pipe infrastructure to serve the REP. Only one set of cooling water pipes will be required for the operation of the plant, however the most appropriate location can only be selected as a consequence of the EIA process. The first of these areas extends to the north of the site and across the outflow of the River Carron and into

the Firth of Forth. The second extends to the east of the site along the alignment of the Grange Burn and into the Firth of Forth adjacent to the main sea lock entrance into the docks. The combined area of these two areas of search extends to 149.16 ha. The EIA process will consider and report on the detailed location of the cooling pipes.

1.4 Implications of Site Boundary Change

- 1.4.1 Forth Energy's consultant team has reviewed the implications of the revised site boundary on the approach to the Environmental Impact Assessment of the proposed development. This has included a review of potential environmental effects, and the methodology to assess identified effects.
- 1.4.2 As a consequence of this review, the consultant team has confirmed that the revised site boundary will not result in any change to the content of the Scoping Report, or the proposed approach to the preparation of the EIA.

1.5 Consultation and Next Steps

- 1.5.1 The revised site boundary, as documented in this Addendum is submitted to the SGECU, and in tandem with this is being circulated to all statutory and non-statutory consultees.
- 1.5.2 The SGECU has also modified its list of consultees since the request for a scoping opinion was submitted, identifying a number of additional non-statutory consultees to be included in the circulation of the request for a scoping opinion. Those consulted originally are identified in table 1.2 on page 7 of the Scoping Report. The additional consultees are noted as follows:
- Clackmannanshire Council
 - Friends of the Earth
 - Greenpeace
 - Scottish Wildlife Trust
 - Scotways
 - Sustainable Development Commission
 - WWF Scotland
 - COSLA
 - Scottish Government Renewable Strategy and On-shore Renewables Division
 - Scottish Government Waste and Pollution Reduction Division
 - Scottish Government Water, Air, Soil and Flooding Division
- 1.5.3 Consultee responses should be directed in all instances, in writing, to the SGECU (with a copy also sent to Forth Energy) at the addresses below, by the deadline set by the SGECU of 18 March 2010.

| | |
|---|--|
| The Energy Consents and Deployment Team Renewable Energy Division Scottish Government 4th Floor, 5 Atlantic Quay 150 Broomielaw Glasgow G2 8LU | Head of Planning Forth Energy 1 Prince of Wales Dock Edinburgh EH6 7DX |
|---|--|

- 1.5.4 It should be noted that consultees' responses will not be treated as confidential unless confidentiality is explicitly requested in the consultee's response.
- 1.5.5 All responses will be duly considered and where appropriate, the scope of the EIA will be amended. The ES will present the outcomes of the scoping and consultation process and explain how comments were addressed.

Appendix 1 – Proposed Site Plan

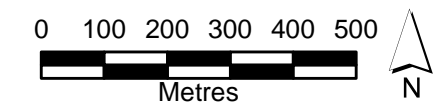
Grangemouth Renewable Energy Plant

Figure 2 (Rev A)

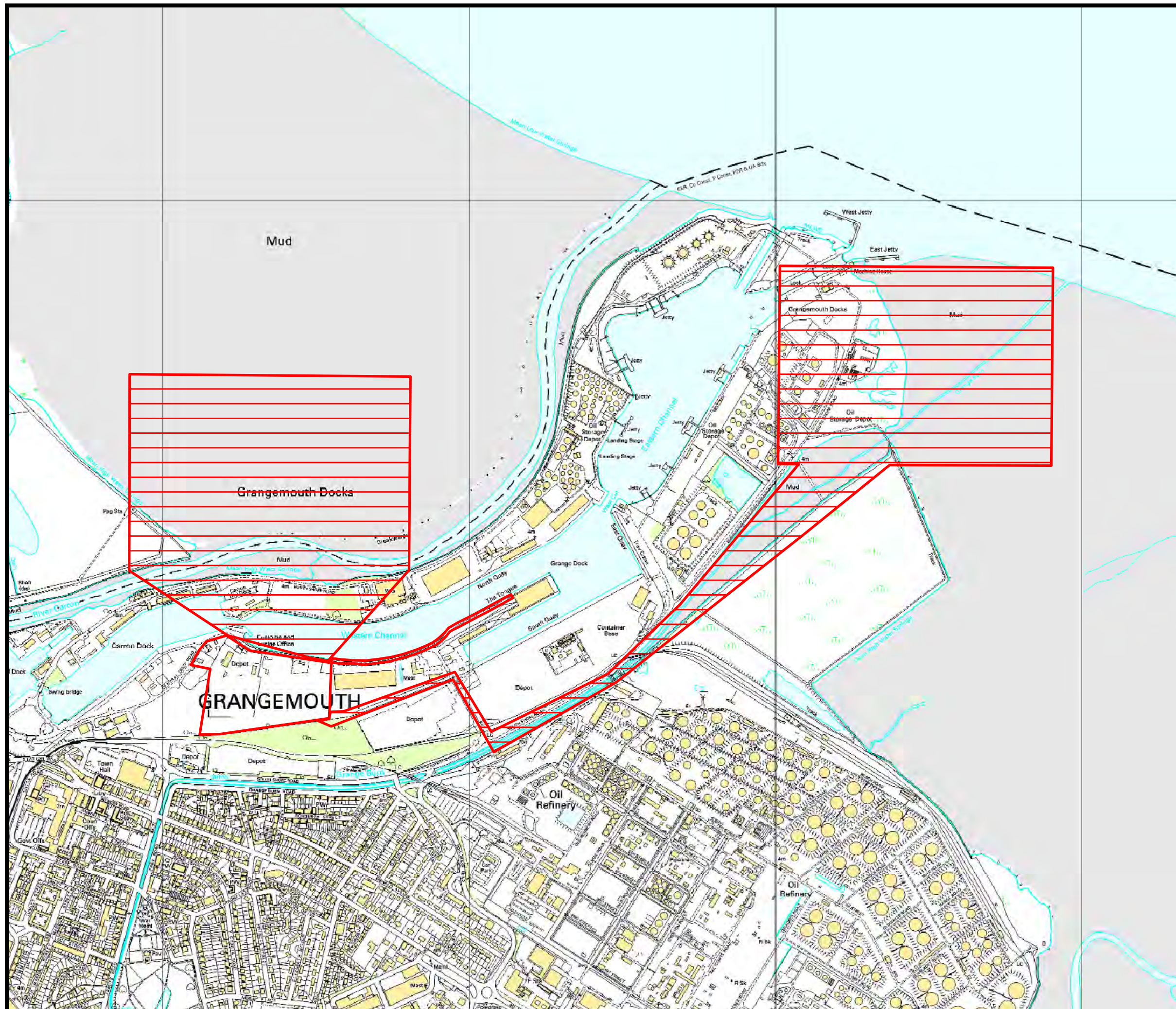
Proposed Site Boundary
(Revised)

Legend

- Site Boundary
- Two Areas of Search for Required Cooling Water Infrastructure



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Real value in a changing world

Grangemouth Renewable Energy Plant *Planning* Statement

prepared on behalf of

Forth Energy

September 2010

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1 Introduction

1.1 Background

- 1.1.1 Jones Lang LaSalle has been commissioned by Forth Energy (hereinafter referred to as “the Applicant”) to provide planning policy advice with regard to the proposed Grangemouth Renewable Energy Plant (hereinafter referred to as the “proposed development”) submitted under Section 36 of the Electricity Act 1989 (hereinafter referred to as “the 1989 Act”).
- 1.1.2 The Section 36 Application for the proposed development is accompanied by an Environmental Statement (ES).
- 1.1.3 This Planning Statement is intended to facilitate the decision making process by providing a comprehensive review of the proposed development in relation to the relevant provisions of the statutory Development Plan, relevant national planning policy, the relevant provisions of the Electricity Act and other material considerations including renewable energy policy.
- 1.1.4 This report is supplementary to the ES which provides a detailed description of the proposed development, and which describes the relevant policy context. This Planning Statement should be read in conjunction with the ES, which is cross-referenced to where appropriate.

1.2 Site Location and Description

- 1.2.1 The proposed Grangemouth Renewable Energy Plant is to be sited within the operational Port of Grangemouth, the general location of which is shown within Figure 1.1 of the ES. The application site is generally level and covers an area of the order of 18.05 hectares (ha) within the operational area of the port. The main plant area is bounded by Central Dock Road and the Western Channel to the north; Central Dock Road to the west; a railway line to the south; and industrial works to the east.
- 1.2.2 The main plant area is currently used for secondary port activities, to support general cargo activities all of which can be relocated in other areas of the port. Grangemouth is the largest container port in Scotland. The Port operates with full marine services and cargo handling activities 24 hours per day, seven days a week. Part of the main plant area is currently occupied by Duncan Adams, a Haulier. The activities associated with this facility will be relocated within the Port estate and the site cleared prior to construction commencing. There are small areas of scattered shrubs to the east of this area.
- 1.2.3 The Carron Dock and Western Channel lie to the north of Carron Dock Road. The River Carron runs 100 to 150 m parallel to the docks to the north, and the Grange Burn and is located 200 m to the south of the closest site boundary. While the nearest shoreline of the Forth Estuary is 100 m to the north of the site (i.e. the southern bank of the River Carron at this location), the River Carron and the docks join the estuary approximately 2.3 km to the north east.
- 1.2.4 The area surrounding the application site is flat, with the Forth Estuary to the north, the town of Grangemouth to the south, industrial complexes on Earls Road to the west, and the Grangemouth Refinery and petrochemical complexes to the north and east. Further to the south, Grangemouth is bordered by the M9 motorway.
- 1.2.5 The application site is located in an industrial port, with oil and gas import, storage and export located around the Eastern Channel, container storage and handling along the southern shore of the Grange Dock, and a fish meal plant adjacent to the Western Channel. The warehousing and industrial buildings and plant within the docks are 20 m or more in height. Directly across the Forth Estuary, to the north, is the coal-fired Longannet Power Station, with an 80 m boiler house and stack of 183 m. The general context and character of the port and the character of the surroundings at this point is broadly industrial.

- 1.2.6 The port area is accessed from the A904 Earls Road / Station Road and there is good access to the M9 via junctions 5 and 6. The port has an extensive, security controlled internal road network.
- 1.2.7 The nearest residences are located 200 m to the south of the site boundary. There is a line of trees between these residences and the boundary of the port and another line of trees along the Grange Burn. The north side of the River Carron comprises agricultural fields, with some isolated houses and the small community of Skinflats.
- 1.2.8 There are a number of recreational facilities in the vicinity of the site, including Falkirk Football Club's stadium approximately 3 km to the southwest, Grangemouth Sports Complex and Grangemouth Sports Stadium approximately 2 km to the south west, and Grangemouth Golf Course, approximately 3 km to the south-south-east.
- 1.2.9 The proposed application site is adjacent to the Firth of Forth Special Protection (SPA) and Firth of Forth Site of Special Scientific Interest (SSSI), with important mudflats at Kinneil to the immediate east of the port and Skinflats to the west. These designated areas support large numbers of nationally and internationally important bird populations.
- 1.2.10 The site is within Falkirk Council's administrative area, with Fife Council's area on the northern bank of the Forth Estuary. A more detailed site description of the site is provided within the ES.

1.3 The Proposed Development

- 1.3.1 The plant will export up to 100 MWe of renewable electricity to the local electricity network and also up to 200 MWth of renewable heat to local users from the use of up to 1.55 million tonnes per year of biomass fuel. The site will incorporate fuel storage, a power plant area, an electrical switchyard and a covered conveyor system for transferring fuel.
- 1.3.2 The application boundary shown in Figure 1.2 of the ES includes:
- the main plant area;
 - an area of search for the installation of the cooling water intake (within the Western Channel);
 - two alternative infrastructure corridors for the installation of cooling water discharge pipes, ;
 - an area of search for the installation of the cooling water outfall (in the vicinity of the River Carron); and
 - an infrastructure corridor for the fuel transfer conveyor (along the Carron Dock Road).
- 1.3.3 The key development components of the operational development will comprise:
- Boiler hall;
 - Boiler hall;
 - Main stack;
 - Turbine hall;
 - Biomass reception and storage facilities;
 - Condenser plant;
 - Cooling water pipelines, intake and discharge infrastructure;
 - Water treatment plant;
 - Heat delivery auxiliary boilers and stack;
 - Flue gas heat exchanger;
 - Heat accumulator tank;

- Fire and potable water storage tanks;
- Demineralised water storage tank;
- Fuel oil storage;
- Back-up generator;
- Fuel conveyors and transfer towers;
- Ash silos and outloading bay;
- Day fuel storage facility with screening equipment;
- Flue gas abatement equipment;
- Bulk chemical storage; and
- Electrical transformer(s) and substation.

1.3.4 The fuel mix for the Renewable Energy Plant will primarily comprise wood chip or wood pellets with the remainder from other biomass fuels as outlined in table 1.1 below. All biomass fuels will be sustainably sourced, as set out in the Sustainability Statement that accompanies this application.

Table 1.1: Fuel Mix

| Wood (70-90%) | Other Fuels (10-30%) |
|--|--|
| Wood Chip or pellets: <ul style="list-style-type: none"> • Virgin Timber - including short rotation forestry (e.g. eucalyptus) • Forest residues | Purpose Grown Energy Crops: <ul style="list-style-type: none"> • Short rotation coppice (e.g. willow) • Grasses (e.g. miscanthus) • Agricultural residues (e.g. rape seed meal) |
| | Recovered Biomass Materials: <ul style="list-style-type: none"> • Timber (including treated timber) • Paper • Cardboard |

1.3.5 The majority of the fuel (at least 90%) will be delivered to the plant by ship, discharged at the existing operational quay and transferred to the fuel storage area via a covered conveyor system. The plant will also be designed to accept fuel delivered by road (up to 15% by energy content).

1.3.6 The site will incorporate fuel storage areas and a power plant area, with fuel being transferred to the storage area and from there to the power plant area via a covered conveyor system. Cooling water infrastructure will also be installed in the impounded dock (i.e. the Western Channel) to provide a supply of cooling water to an evaporative cooling system using mechanical draught cooling structures. This cooling water will be discharged via an outfall in the Carron River. Figure 6.1 in the ES shows the proposed layout including open fuel storage, which would be utilised if the fuel used in the Renewable Energy Plant comprises predominantly woodchip. Figure 6.2 in the ES shows a layout where the main fuel store includes silos which would be necessary if the fuel used is predominantly wood pellets. The form of fuel to be used (chip or pellet) has yet to be determined, as this will require detailed discussions with potential suppliers which can only take place realistically once a consent has been granted.

- 1.3.7 The potential for the plant to increase its efficiency through the supply of steam and/ or hot water to nearby users has been investigated. Discussions are ongoing with a number of potential heat users, including Ineos regarding the refinery and petrochemical complex. It is Forth Energy's intention that renewable heat/steam will be supplied to local users where commercially feasible. Users cannot enter into contracts with Forth Energy until the plant has consent and a likely commissioning date. Therefore the detail of how heat will be delivered will need to be worked up at a later stage in the consenting process. The proposed plant has been designed to include appropriate off-takes to enable steam or hot water to be supplied in the future, should any users wish to contract for it. A Combined Heat and Power (CHP) Feasibility Study has been submitted with this Section 36 Application.
- 1.3.8 A new onsite 132 kV substation will be built to transform and transmit the electrical output from the plant to the local 132 kV network via a 132 kV underground electrical connection onto the main national transmission network at Bainsford substation. The off-site electrical connection is not within the scope of the Section 36 Application and consequently the EIA. However an indicative route is shown in Figure 6.4 in the ES and, wherever possible, the known impacts of the cable are discussed in the ES.
- 1.3.9 The proposed Renewable Energy Plant is a low carbon technology and is also below the 300 MWe European Union threshold for the consideration of Carbon Capture Readiness. It is not therefore proposed to design or build the plant to be Carbon-Capture Ready (CCR).
- 1.3.10 The construction period for the proposed plant will be approximately 36 months. Subject to the granting of all necessary planning and environmental consents and permits, construction of the Grangemouth Renewable Energy Plant could begin in 2012, with full operation anticipated by 2015.

1.4 The Need for the Proposed Development

- 1.4.1 The renewable energy policy context for the proposed development is set out within Chapter 4 of the ES. The need case is based on renewable energy and heat policies and targets set at the European, UK and Scottish Government levels. The ability to meet these targets is reliant on the granting of consent for and the implementation of new renewable energy developments.
- 1.4.2 Chapter 4 of this Planning Statement refers to material considerations and addresses renewable energy targets and the contribution that the proposed development would make to attaining targets and policy objectives.

1.5 Approach

- 1.5.1 The Applicant has submitted the application for the proposed Grangemouth Renewable Energy Plant to The Scottish Government under s.36 of the 1989 Act. As part of the s.36 application process, the Applicant will also be seeking that The Scottish Ministers issue a Direction under s.57(2) of the Town and Country Planning (Scotland) Act 1997¹ as amended ("the 1997 Act") that deemed planning permission be granted for the development detailed.
- 1.5.2 As set out in section 1.1, the purpose of this Planning Statement is to review the proposed development in the context of Development Plan policy and relevant material considerations. This Planning Statement explains the relationship of the proposed development to the policy framework as set out within the statutory Development Plan, then considers the extent to which the development is in accordance with national energy policy and national planning policy, and finally, identifies other material considerations that apply and considers the weight to be attributed to them in decision making.
- 1.5.3 This Planning Statement considers the predicted significant environmental effects of the proposed development with reference to the overall aims and objectives of the Development Plan. Key Development Plan policies are considered and conclusions are presented with regard to the

¹ As amended by the Planning etc. (Scotland) Act 2006.

accordance of the proposed development with such policies. Overall conclusions are also presented, taking into account the provisions of the Development Plan and key material considerations.

1.5.4 The decision to grant consent under the 1989 Act is the principal decision. In the event that a decision is taken to grant a s.36 consent then no circumstances can be envisaged that would see deemed planning permission under s.57 of the 1997 Act withheld.

1.5.5 Paragraph 3(1) of Schedule 9 to the Electricity Act 1989 places a specific statutory requirement on The Scottish Ministers, when considering applications for s.36 consent, to have regard to:

- *“the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeology interest; and*
- *the extent to which the developer has complied with its duty to do what it reasonably can to mitigate any effect which the proposals would have on the natural beauty of the countryside or any such flora, fauna, features, sites, buildings or objects.”*

1.5.6 The Applicant has taken full account of these obligations in the preparation of the proposed development. The ES demonstrates that due regard to the above matters and appropriate mitigation has been considered in detail.

1.5.7 In considering the overall legal framework within which the proposed development requires to be assessed, it is considered that the terms of the statutory Development Plan is a material consideration which should be considered in the round with all other material considerations.

1.5.8 The approach to the preparation of this Planning Statement has involved detailed consideration of the findings of the ES and close dialogue with the multi disciplinary consultants that have been involved in the preparation of the ES.

1.6 The Statutory Development Plan

1.6.1 The statutory Development Plan applicable to the consideration of the proposed Renewable Energy Plant consists of the following Structure and Local Plan:

- The approved Falkirk Council Structure Plan (2007); and
- The adopted Grangemouth Local Plan (1985 and the 2nd Alteration 1990).

1.6.2 The Falkirk Council Local Plan was finalised in 2007. The Local Plan Inquiry ended in the summer of 2009 and the Reporter's recommendations were published in March 2010. These recommendations were considered by the Falkirk Council Planning Committee in June 2010. The Finalised Draft Local Plan is expected to be formally adopted in the late Autumn of 2010. It is currently a material consideration in the determination of any planning application in the Plan area and is given significant weight by the Council in contrast to the adopted Local Plan which is very dated.

1.6.3 Given the advanced status of the emerging Local Plan, the policy assessment undertaken has addressed the relevant provisions of the Finalised Local Plan rather than those of the Grangemouth Local Plan.

1.7 Structure of Report

1.7.1 Chapter 1 as set out above, provides an introduction to the proposed development and to the approach taken to the preparation of this Planning Statement.

1.7.2 Chapter 2 provides a summary of the strategic aims and objectives of the statutory Development Plan and assesses the proposed development with reference to policy.

- 1.7.3 Chapter 3 assesses the proposed development in terms of the relevant policies of the Development Plan.
- 1.7.4 Chapter 4 refers to relevant material considerations, including renewable energy policy, Scottish Planning Policies and guidance and relevant Supplementary Planning Guidance.
- 1.7.5 Chapter 5 presents the overall conclusions of the assessment of the proposed development in terms of policy and material considerations.

2 The Falkirk Council Structure Plan

2.1 Introduction

2.1.1 The Falkirk Council Structure Plan provides the strategic land use policy framework for the Falkirk Council administrative area. This Chapter of the Planning Statement examines the proposed Renewable Energy Plant against the relevant 'aims and objectives' and individual policies of the Structure Plan. Conclusions are presented as to whether the proposed Renewable Energy Plant is in accordance with the strategic land use policy framework contained within the Structure Plan as a whole.

2.2 Structure Plan Strategy

2.2.1 The Structure Plan sets out a development strategy within Chapter 2 and the strategy is expressed in the plan as follows:

"To achieve this vision of a positive future for the area, the Council believes that a strategy of carefully managed growth which benefits all its communities must be pursued over the period of the Structure plan. Therefore, the strategy:

- *Provides for population and economic growth, so that the vitality of and profile of the area as a whole is maintained and strengthened.*
- *Distributes growth amongst the different settlements, having regard to their physical and environmental capacity and social and economic needs, in order to ensure their future viability and a healthy level of self-containment.*
- *Promotes major strategic economic development at selected mixed use development opportunities, which are, or can be made, easily accessible by public transport and will stimulate economic growth in jobs and competitiveness.*
- *Identifies, protects and enhances the area's key environmental assets, requiring a new development to conserve these assets and to attain a consistently higher level of design quality that has hitherto been achieved in the area.*
- *Ensures that growth is realistic and achievable, social and physical infrastructure requirements having been assessed and mechanisms for securing their provision put in place."* (paragraph 2.28, page 10).

2.2.2 The strategy and policies of the Structure Plan have been built around four strategic themes, which are:

1. Economic Prosperity;
2. Sustaining Communities;
3. Environmental Quality; and
4. Sustainable Transport.

2.2.3 The implications of these themes for the Council's strategy is set out in the plan, and the key points of relevance to the proposed Renewable Energy Plant are summarised as follows:

Economic Prosperity

“At present, the area is vulnerable to further job losses in the manufacturing sector and an increase in out-commuting. Further job creation is necessary to encourage in-migration and a more robust and diversified economy.” (paragraph 2.32, page 12).

2.2.4 The strategy identifies a number of objectives, including the following items of relevance:

- *“Concentrate new employment generating development on the major strategic development opportunities, taking advantage of their excellent accessibility and market attractiveness.....”*
- *Continue to support and provide for the expansion of the Grangemouth chemicals sector, subject to continuing improvements in environmental and safety performance.....”* (paragraph 2.32, page 12).

Environmental Quality

“The area is endowed with a range of environmental assets of national and local importance which require to be protected. Whilst a growth strategy has potentially adverse implications for these assets, the investment which comes with it can be a means to achieve environmental enhancements.”

2.2.5 It is identified that the strategy will seek to:

- *“Identify and apply appropriate levels of protection to landscape, ecological and heritage assets within the area.*
- *Require a high standard of design and quality in new development, with particular attention paid to visual, landscape, accessibility, community safety and substantial factors.”* (paragraph 2.34, page 13).

Sustainable Transport

2.2.6 It is identified that the strategy will:

- *“Seek to locate new development in locations which minimise the number and length of car trips.”* (paragraph 2.35, page 13)

2.2.7 The strategy has the following implications for Grangemouth:

“In Grangemouth, development will focus on the vacant land at the docks which is identified as a mixed use strategic development opportunity. This will include the expansion of the town centre, further port related development and potentially, leisure uses associated with the Millennium Link.Any development will have to be carefully planned to balance the need to meet health and safety requirements, safeguard the existing chemical and petrochemical industries, safeguard the operation of the docks and ensure no adverse impact on the Firth and Forth Special Protection Area.....” (paragraph 2.41, page 14).

2.2.8 The proposed Renewable Energy Plant is considered to be supported by the Structure Plan's development strategy and strategic themes. The proposed development will deliver significant economic benefits to the Falkirk Council area and to the wider Scottish economy through job creation and added economic value. This is reported within Chapter 16 of the ES. The approach to the design and siting of the proposed Renewable Energy Plant has also sought to minimise significant adverse environmental effects, and is considered to have achieved an appropriate balance between economic development and environmental stewardship. The only residual significant environmental effects predicted in the ES relate to visual effects. All others have been avoided or mitigated.

2.2.9 The application site is brownfield in nature and the proposed Renewable Energy Plant would integrate appropriately with existing infrastructure, such as the road network and the port. The proposed Renewable Energy Plant embraces the principles of sustainable development.

2.2.10 In consideration of the above, it is concluded that the proposed Renewable Energy Plant is wholly consistent with and supported by the aims and objectives of the Structure Plan and as such would aid in the delivery of the strategic land use policy framework set out in the plan.

2.3 Key Structure Plan Policies

2.3.1 The key Structure Plan policies which are considered relevant to the assessment of the proposed development are set out within Chapter 5 of the ES. The proposed development has been assessed against these policies, which are listed below in Table 2.1.

Table 2.1: Key Structure Plan Policies

| Structure Plan Policy | Policy Title |
|-----------------------|--|
| ENV.13 | General Principles for Renewable Energy |
| ENV 7 | Quality of Development |
| ECON.1 | Strategic Development Opportunities |
| ECON.2 | Strategic Development Opportunities – Development Criteria |
| ENV.3 | Nature Conservation |
| ENV.4 | Coastal Planning and Flooding |
| ENV.5 | Built Environment |
| TRANS.3 | Transport Assessment |
| TRANS.4 | Freight Operations |
| ENV.15 | Water Quality |
| COM.5 | Developer Contributions |
| ENV.14 | Air Quality |

2.4 Structure Plan Policy Assessment

Renewable Energy Policy

2.4.1 The Structure Plan (para 5.33) acknowledges that there is growing concern over the impact on the global environment arising from the burning of fossil fuels to generate electricity and heat. It highlights that the Government is promoting a series of measures aimed at reducing energy consumption and increasing the amount of energy generated from renewable sources including wind, hydro power and “the burning of quick growing timber using clean technology”. The supporting text to the renewable energy policy in the Structure Plan states that whilst it is appropriate to give general support for renewable energy developments, careful control of potential impacts is also necessary.

2.4.2 **Policy ENV.13 ‘General Principles for Renewable Energy’** states that:

“Proposals for the generation of energy from renewable sources will generally be supported subject to an assessment of individual proposals in relation to Structure Plan Policies ENV.1-ENV.7. The council will work

in partnership with other agencies to set out, in the local plan, the criteria for the location and design of renewable energy developments.” (page 54).

- 2.4.3 The policy states that renewable energy developments will be supported subject to assessment against other specific policies. The proposed development has been assessed against these policies in the following sections.
- 2.4.4 The benefits of the proposed Renewable Energy Plant have been quantified and are significant. In terms of electricity generation, the plant would deliver 100 MWe of installed renewable generating capacity. The Renewable Energy Plant has a strategic fit with the energy requirements of the Falkirk Council area. It will be capable of supplying approximately 92% of the overall (industrial, commercial and domestic) electricity requirements of the Council area.
- 2.4.5 The annual carbon emission savings for the Renewable Energy Plant in 2015 would be 0.16 Mega tonnes of CO₂e². Taking into account the reduction in carbon in the UK grid, the savings over the life time of the Grangemouth plant are estimated to be approximately 3.2 Mega Tonnes of CO₂e.
- 2.4.6 Forth Energy has prepared a CHP Feasibility Study in support of the Section 36 Application. This reports on the potential for the Renewable Energy Plant to provide various grades of heat for industrial, commercial and for district heating uses near to the application site.
- 2.4.7 A Heat Mapping exercise has been undertaken which has identified a number of potential heat customer opportunities, with a varying range of requirements for heat. Initial discussions have been held with process industry heat customers and the proximity of the Grangemouth Refinery provides a considerable opportunity for Forth Energy to supply an element of its process heat needs. A total potential of 200 MW of process heat supply has been identified between the Refinery and a number of other process heat users. Initial discussions have been held with the management at the Ineos Refinery whose production facilities are located immediately adjacent to the Port.
- 2.4.8 Discussions with Falkirk Council have identified considerable potential for the development of a District Heating network to service Grangemouth town centre. The quantity of medium grade heat available from the flue gases suggests that there is the potential to supply a District Heating network with a capacity of up to 19 MW. The Heat Mapping Exercise indicates the potential to deliver heat to up to 33 discrete customer locations.
- 2.4.9 Preliminary estimates show potential renewable heat supply volumes ranging from between 1,114 GWh/annum in Year 1 to 1,580 GWh/annum in Year 6. Subject to further detailed feasibility assessment, it may be possible to accelerate or extend this implementation.
- 2.4.10 The economic benefits that the proposed development would deliver are reported within Chapter 16 of the ES, 'Socio-economics', in terms of the direct, indirect and supply chain employment benefits that the proposed development would deliver to the economy as well as the Gross Value Added (GVA) per annum to the local economy. These benefits are summarised below:
- 2.4.11 Construction of the Renewable Energy Plant will directly generate the equivalent of 90 Full Time Equivalent (FTE) jobs, with a further indirect and induced employment of 49 FTE jobs, representing a total estimated net additional local employment equal to 139 FTE jobs.

² **CO₂e equivalence:** Where emissions from a process include gases other than carbon dioxide, measuring in **CO₂e** makes reporting simpler. Carbon dioxide is the most common greenhouse gas, but there are five others main greenhouse gases (methane, nitrous oxide, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexachloride). Carbon dioxide equivalence (**CO₂e**) is a measure that enables the total impact from all emission sources to be represented in a single number for all the greenhouse gases produced, based upon their individual global warming potential.

- 2.4.12 In the operational phase, the estimated FTE jobs are 40, with an additional indirect 107 FTE jobs created in Scotland, giving a total estimated figure of net additional jobs of 147 FTEs.
- 2.4.13 The total (i.e. aggregate) quantitative economic benefits which would accrue over the lifetime of the development from the construction, operation, supply chain and decommissioning of the Renewable Energy Plant are considerable:
- At a local level 139 FTE net additional jobs and £15.6 million GVA growth per annum; and
 - At a Scottish level 147 FTE net additional jobs and £16.45 million GVA growth per annum.
- 2.4.14 There are therefore substantial quantifiable environmental *and* economic benefits that will arise from the proposed development.
- 2.4.15 The proposed development has been subject to a rigorous EIA and the ES reports on the potential of the proposed development to result in significant effects on the environment and how these can be minimised and mitigated.
- 2.4.16 The ES sets out proposed mitigation measures to minimise the effects on the environment where possible. Post-mitigation, significant environmental effects will be confined to those of a landscape and visual nature. There will be no other residual significant environmental effects.
- 2.4.17 A Transport Statement is reported within Chapter 18 of the ES and this has demonstrated that there would be no significant effects arising in terms of traffic and transport matters.
- 2.4.18 The landscape and visual impact assessment is reported within Chapter 10 of the ES. The assessment has examined the proposed Renewable Energy Plant on the basis of a 10 km study area. The assessment has identified four significant visual impacts and no significant landscape impacts. The significant visual impacts are as follows:
- Viewpoint 1 – A904 Asda Car Park, Grangemouth;
 - Viewpoint 2 – Grangeburn Road, Grangemouth;
 - Viewpoint 3 – Skinflats Nature Reserve; and
 - Viewpoint 11 - Kincardine.
- 2.4.19 While the proposed Renewable Energy Plant will result in significant visual impacts, these are not considered to be unacceptable. Additional offsite planting will potentially reduce two of these impacts (from View 2 Grangeburn Road and View 3 Skinflats). Significant visual impacts identified from View 1 will only occur when a visual plume is present and for some of the time the proposed plant would operate without generating a significant visual impact.
- 2.4.20 The Port of Grangemouth is in existing industrial use. The Renewable Energy Plant, is considered an acceptable form of industrial urban development within this context.
- 2.4.21 The proposed development, subject to the mitigation measures identified within the ES, would result in limited significant environmental effects, which can be offset against the significant economic and environmental benefits identified above. The proposed development is therefore considered to be in accordance with Policy ENV.13 and should be regarded favourably. The proposed development is considered against the wider environmental policies of the Structure Plan below.

Design Policy

- 2.4.22 **Policy ENV.7: 'Quality of Development'** states that:

"Priority is attached to the achievement of high standards of design in all new development. Proposals for development which would have significant visual and physical impact on a site and its surroundings must be

accompanied by a “design concept statement” incorporating the relevant factors outlined in Schedule ENV.7 which sets out how design principles have been addressed and how quality objectives will be achieved.

Local Plans and Supplementary Planning Guidance will provide detailed guidance on how significant impact will be assessed and the details to be included in such design concept statements.” (page 50)

2.4.23 The proposed development is industrial in nature and appearance. An indicative design concept is proposed, which illustrates how it can integrate successfully with, and make a positive contribution to the surrounding built environment within which it is located. Illustrative visualisations have been submitted with the application. In accordance with Policy ENV.7, a Design Concept Statement has been submitted in support of the proposed development and this should be referred to for further detail on design matters. The Design Concept Statement addresses the relevant factors outlined in Schedule ENV.7.

2.4.24 While Chapter 10 of the ES ‘Landscape and Visual Assessment’ identifies that the proposed Renewable Energy Plant will result in 4 significant visual effects and no significant landscape effects, as stated above, the impact of these is considered to be acceptable, in the context of wider policy objectives.

2.4.25 The proposed development will result in limited significant environmental effects and a carefully considered urban design approach has been followed. The proposed development is considered to be in accordance with policy ENV.7.

Land Use Policy

2.4.26 **Policy ECON.1: ‘Strategic Development Opportunities’** refers to a number of strategic locations and relevant parts of the policy are as follows:

“The Council will promote the following as strategic locations for major economic development:

TOWN CENTRES

2. Grangemouth Docks

SPECIALIST SITES

8. Grangemouth/Kinneil Kerse

Site boundaries will be defined or confirmed in Local Plans. The range of acceptable uses at each of these strategic sites is indicated in Schedule ECON.1.” (page 18).

2.4.27 **SCHEDULE ECON.1: ‘Strategic Development Opportunities’** (page 19) identifies the proposed uses for the Grangemouth Docks strategic site as follows:

Grangemouth Docks

- Office/Industry/Distribution;
- Leisure/Tourism (Millennium Link related);
- Food Retail/Non-Food Retail (Town Centre Expansion);
- Residential;
- Port-Related Activities; and

- Railway Station.

2.4.28 The proposed development is located within the Grangemouth Docks area and as identified in Policy ECON.1 and Schedule ECON.1, port-related and industrial activities are acceptable within this area. The proposed development is therefore in accordance with Policy ECON.1.

2.4.29 **Policy ECON.2: 'Strategic Development Opportunities – Development Criteria'** states that:

"Development of the strategic development opportunities identified in Policy ECON.1" will be subject to a number of conditions, the following of which are considered relevant:

1. *high standards of design will be required through a development brief and masterplan for each opportunity which will be approved by the Council and ensure a comprehensive and sensitive approach to site planning;*
2. *provision must be made for walking, cycling and public transport infrastructure to allow a high level of access by transport modes other than the private car;*
3. *development at Grangemouth Docks must not be prejudice the operation of the port and should be compatible with the continuing activities of the petrochemical and chemical industries...." (page 22).*

2.4.30 As discussed in the previous section (under Design Policy), a carefully considered design approach to site planning has been undertaken and an overall high quality standard of design is proposed for the Renewable Energy Plant.

2.4.31 The nature of the proposed Renewable Energy Plant means that it will not require a high level of access by transport modes other than by operational staff vehicles. Traffic accessing the site during the construction and operational phases of the development will utilise the local and strategic road network via either the M9 Junction 6, the A904 Earls Road and North Shore Road, or alternatively via the M9 Junction 5, the A9 Laurieston Bypass, Falkirk Road, the A904 Earls Road and North Shore Road. Routeing Agreements will be put in place for civil and mechanical, and biomass / maintenance deliveries to ensure that Renewable Energy Plant traffic avoids the Beancross Road corridor and the adjacent residential areas. The Transport Statement has confirmed the suitability of the road network to accommodate the likely volumes of traffic expected as a result of the proposed development during all stages of its lifecycle.

2.4.32 In terms of the third part of Policy ECON 2, as has been explained, the proposed development is industrial in nature and will be a port-related activity. It will therefore be compatible with existing activities in the surrounding area.

2.4.33 The proposed development is in accordance with Policy ECON.2: 'Strategic Development Opportunities – Development Criteria'.

Natural Heritage Policy

2.4.34 **Policy ENV 3: 'Nature Conservation'** seeks to protect and promote nature conservation interests. In particular this specifies:

1 Any development likely to have a significant effect on a designated or potential European Site under the Habitats or Birds Directives (Special Areas of Conservation and Special Protection Areas) or on a Ramsar or Site of Special Scientific Interest (see Schedule Env.3), must be subject to an appropriate assessment of the implications for the sites conservation objectives.....

2 Sites of local or regional importance, including Wildlife Sites and Sites of Importance for Nature Conservation, will be defined in Local Plans..... Development likely to have an adverse impact on any such

site or feature will not be granted planning permission unless it can be clearly demonstrated that there are reasons which outweigh the need to safeguard the site or feature. Until such areas are defined in Local Plans, identified or potential sites will be afforded the same protection.

3 Local Plans will identify opportunities for enhancing the natural heritage including new habitat creation, the identification of 'wildlife corridors' and measures to ensure the protection of priority local habitats and species as identified in the Falkirk Local Biodiversity Action Plan.

4 The aims and objectives of the Falkirk Local Biodiversity Action Plan and any associated Species Action Plans and Habitat Action Plans will be a material consideration in assessing any development proposal likely to impact on local priority species and habitats." (page 45)

2.4.35 Chapter 12 of the ES, 'Terrestrial Ecology,' identifies international statutory designated conservation sites, i.e. Ramsar Wetlands, Special Areas of Conservation and Special Protection Areas, within 15 km of the application boundary. In addition, national statutory designated conservation sites, e.g. Sites of Special Scientific Interest (SSSIs) and National Nature Reserves (NNRs), within 10 km of the application boundary are identified. Local statutory designated conservation sites, i.e. Local Nature Reserves (LNRs), within 2 km of the application boundary, are also identified. A summary of the qualifying interest of these designations is provided within Table 12.4 of Chapter 12 'Terrestrial Ecology' of the ES.

2.4.36 The ES identifies that the proposed development is not predicted to result in any significant adverse effects on ecological receptors of local or higher value, notable habitats and designated sites. In this regard, the proposed development is considered to be in accordance with the relevant aspects of this policy.

Built Heritage Policy

2.4.37 **Policy ENV.5: 'Built Environment and Heritage'** states that:

"Important Archaeological Sites, Scheduled Ancient Monuments, Listed Buildings, Conservation Areas, sites included in the Inventory of Historic Gardens and Designed Landscapes and trees will be protected and enhanced. Local Plans will identify these assets and incorporate policies appropriate to the significance of the area or individual feature, including the following range of measures.

- 1. Measures to ensure that assets are maintained in a good state of repair;*
- 2. Promotion of appropriate new uses for buildings;*
- 3. Promoting sensitive interpretation of heritage assets;*
- 4. Protection of the assets and their setting from inappropriate development;*
- 5. Where development would damage, or result in the loss of the asset, that provision is made for adequate recording of the current status of the asset; and*
- 6. Reviewing the boundaries of areas to ensure their continuing relevance." (page 48).*

2.4.38 The ES reports that the proposed development will not result in any significant adverse effects on the built environment and heritage designations set out in Policy ENV.5 above. Table 15.10 in Chapter 15, 'Cultural Heritage', summarises the potential impacts of the proposed Renewable Energy Plant upon cultural heritage features resulting from its construction, operation and decommissioning. The ES

identifies that there will be no significant adverse effects arising from the proposed development on any cultural heritage features and their settings, including historic docks and the Antonine Wall.

- 2.4.39 As there are no predicted significant environmental effects on cultural heritage features in EIA terms, the proposed development is considered to be in accordance with Policy ENV.5 'Built Environment and Heritage'.

Transport Policy

- 2.4.40 **Policy TRANS.3: 'Transport Assessment'** states:

"Proposals which could result in a significant increase in travel demand will be required to submit a Transport Assessment and where appropriate a Green Transport Plan. These should demonstrate how the impact of the development on the surrounding traffic networks can be minimised and how other modes of travel rather than car will be encouraged." (page 63)

- 2.4.41 A Transport Statement has been prepared for the proposed development and this has considered the existing background conditions relevant to the proposed development. Potential traffic generation arising from the construction, operation and decommissioning of the proposed renewable Energy Plant has been assessed. The Transport Statement has confirmed the suitability of the road network to accommodate the likely volumes of traffic expected as a result of the proposed development during all stages of its lifecycle.

- 2.4.42 The proposed development is considered to be in accordance with Policy Trans. 3 'Transport Assessment'.

- 2.4.43 **Policy TRANS.4: 'Freight Operations'** states that:

"The Council will direct developments generating significant volumes of freight to sites accessible by rail and/or sea. The preferred locations for freight related uses that require port and/or rail access will be:

1. Grangemouth Docks;
2. Grangemounth branch line; and
3. Allandale." (page 64).

- 2.4.44 The proposed development would involve the transport of freight to the site at Grangemouth Docks by sea, and is consequently considered to be in accordance with Policy TRANS.4 'Freight Operations'.

Flooding and Drainage Policy

- 2.4.45 **Policy ENV.4 'Coastal Planning and Flooding'** states that *"the Council will apply the following general principles with regard to coastal planning and flooding issues:...*

.....4) In areas where there is a significant risk of flooding, there will be a presumption against new development which would be likely to be at risk or would increase the level of risk for existing development. Where necessary the Council will require applicants to submit supplementary information to assist in the determination of applications." (page 47).

- 2.4.46 ES Chapter 14 'Hydrology, Hydrogeology, Geology and Soils', confirms that the application site lies within the Indicative River and Coastal Flood Map (Scotland) 200 year flood outline and as such is potentially at medium to high risk of coastal flooding.

2.4.47 To mitigate against flood risk, it is proposed to locate development components that require personnel attendance at above 5.464 AOD as well as all equipment which would be sensitive to flood events. The flood risk to the site can be appropriately managed.

2.4.48 The proposed Renewable Energy Plant is an industrial development: the proposed mitigation measures would safeguard site users and sensitive site equipment and would not affect the potential of flooding on other surrounding sites.

2.4.49 The proposed development is considered to be in accordance with Policy ENV.4 'Coastal Planning and Flooding'.

2.4.50 **Policy ENV.15 'Water Quality'** states:

"The Council will contribute to the improvement of water quality in local rivers and lochs. Specifically, subject to appropriate maintenance agreements, the adoption of "Sustainable Urban Drainage Manual" as advocated by the Scottish Environment Protection Agency will be supported in all major new developments."(page 55).

2.4.51 Chapter 14 'Hydrology, Hydrogeology, Geology and Soils' states that no significant environmental effects have been identified in terms of impacts to the hydrological or hydrogeological environment. Therefore, overall, the proposed Renewable Energy Plant will not result in any significant effects on the water environment.

2.4.52 The proposed development is considered to be in accordance with Policy ENV.15 'Water Quality'.

Other Policies

2.4.53 **Policy COM.5: 'Developer Contributions'** seeks to ensure that *"proper provision is made to meet the physical and social infrastructure needs of new development and to mitigate the impact of such development on the locality"* (page 35). Developer funding may be sought for works relating to environmental enhancement, physical infrastructure, and community and recreational facilities.

2.4.54 Further examples of the range of matters which developers may be asked to address are provided in Schedule COM.5 on page 35 of the Plan.

2.4.55 The developer does not consider that any need for contributions arises as a consequence of Policy COM.5 'Developer Contributions'.

2.4.56 **Policy ENV.14: 'Air Quality'** states:

"The Council will contribute to the improvement of local air quality through the development and implementation of the Structure Plan Strategy including: consideration of air quality standards in selecting locations for new development and in assessing development applications; reducing the need to travel through protecting the viability of individual settlements and shopping centres; and in promoting public transport and an integrated transport system." (page 55).

2.4.57 This policy is relevant to both the implementation of the Structure Plan Strategy and also the assessment of individual development proposals.

2.4.58 Chapter 9 of the ES considers the potential for the proposed development to result in effects on long term air quality arising from emissions, as well as shorter term impacts arising from particulate matter and traffic emissions from its construction and decommissioning. The assessments undertaken have confirmed that the potential impacts are not significant.

2.4.59 The proposed development is considered to be in accordance with Policy ENV.14 'Air Quality'.

2.5 Conclusion

- 2.5.1 It is concluded that the proposed development is consistent with, and would further, the Structure Plan's strategy and 'strategic themes'. In this regard it is particularly relevant to note the predicted quantifiable environmental and economic benefits of the proposed development, the scale of renewable electricity and heat generation, the sustainable mode of transporting fuel, the reuse of previously developed industrial land, and the mitigation measures set out within the ES.
- 2.5.2 The key Structure Plan policy of relevance to the proposed development is ENV.13 'General Principles for Renewable Energy'. The policy provides explicit support for renewable energy developments subject to an assessment of individual proposals in relation to certain other Structure Plan policies. As noted in paragraphs 2.4.2 - 2.4.21 above, the Renewable Energy Plant would deliver significant quantifiable benefits, and, whilst there will be some limited significant environmental effects, these are not considered to be unacceptable. Environmental effects have been addressed satisfactorily and no conflict is identified with other relevant Structure Plan policies.
- 2.5.3 The other Structure Plan policies considered in this Chapter examine planning matters applicable to a wide range of development types. They are not specific to renewable energy developments. The environmental effects (both positive and adverse) and the economic benefits that would arise from the proposed development have been considered in the context of these policies. It is concluded that the proposed development is supported by the policies of relevance and that there are no elements of the proposal that would undermine the strategic land use policy framework as set out in the Structure Plan.
- 2.5.4 It is considered that the proposed development would aid the attainment of the Structure Plan's strategy as summarised in section 2.2 above. The proposed Renewable Energy Plant is considered to be in accordance with the relevant policies of the Structure Plan and the Plan when read as a whole.

3 The Finalised Falkirk Local Plan

3.1 Introduction

3.1.1 This chapter provides an assessment of the proposed Renewable Energy Plant against the relevant 'aims and objectives' and individual policies of the Finalised Local Plan. Conclusions are presented as to whether the proposed development is in accordance with the Local Plan as a whole.

Finalised Local Plan Objectives

3.1.2 The Finalised Local Plan identifies four primary objectives in implementing the Structure Plan's strategy. In the Plan, Table 2.1 (page 10) identifies what are termed as the primary and secondary objectives of the Local Plan. These are set out in Table 3.1:

Table 3.1: Local Plan Primary and Secondary Objectives (most relevant with bold emphasis)

| SUSTAINABLE GROWTH IN ALL OUR COMMUNITIES | |
|--|--|
| ENVIRONMENTAL QUALITY | SUSTAINING COMMUNITIES |
| Effect a significant improvement in the quality of the built and natural environment in the area <ul style="list-style-type: none"> • Improve design quality and standards • Enhance the environment and image of the area • Protect and enhance our natural heritage, with countryside and Green Belt, urban greenspace, landscape resources, biodiversity, woodland, watercourses and the coast promoted as an integrated and accessible Green Network • Ensure that mineral extraction is environmentally sensitive, in terms of where it is permitted, how it is carried out and the effectiveness of restoration. | Sustain the viability and quality of life of each individual community within the area <ul style="list-style-type: none"> • Meet housing growth targets in sustainable locations, and ensure growth is balanced and meets housing need • Create and maintain residential amenity • Achieve quality community infrastructure in association with growth, with particular emphasis on safeguarding and improving existing facilities, and securing appropriate developer contributions. |
| ECONOMIC PROSPERITY | SUSTAINABLE TRANSPORT AND INFRASTRUCTURE |
| Promote a stronger and more diverse local economy building on the area's locational and other strategic assets <ul style="list-style-type: none"> • Promote the Strategic Development Opportunities as key drivers of regeneration and job creation • Enable and safeguard land for business growth in sustainable locations • Create and maintain vital and viable town, district and local centres • Promote the leisure and tourism sector with emphasis on the canal corridor • Manage risk from major hazards, with a balance achieved between health and safety aspects and regeneration needs. | Create an integrated network of transport and other physical infrastructure which supports sustainable development goals <ul style="list-style-type: none"> • Promote sustainable transport choices to reduce car travel • Develop a safe and efficient transport network • Promoting sustainable drainage practices and reducing flood risk • Minimise the environmental impact of other forms of essential infrastructure, such as telecommunications • Support sustainable waste management • Develop the area's renewable energy potential |

3.1.3 Not all of the above objectives are relevant to the proposed Grangemouth Renewable Energy Plant. Those that relate to design quality, protection of the environment and residential amenity. The proposed development is considered to be consistent with these objectives. The most relevant objective however, is that relating to the need to "*develop the area's renewable energy potential*" and it

is considered that the proposed development derives significant support in policy terms due to its ability to help the Council attain this policy objective.

3.2 Key Local Plan Policies

3.2.1 The key Local Plan policies which are considered relevant to the assessment of the proposed development have been identified and are listed in Table 3.2 below.

Table 3.2: Key Local Plan Policies

| Local Plan Policy | Policy Title |
|-------------------|---|
| ST20 | Renewable Energy |
| EQ1 | Sustainable Design Principles |
| EQ22 | Landscape and Visual Assessment |
| EQ28 | The Coastal Zone |
| EP1 | Strategic Development Opportunities |
| EP2 | Land for Business and Industrial Use |
| EP4 | Business and Industrial Development within the Urban and Village Limits |
| EP18 | Major Hazards |
| EQ24 | Ecological Sites and Features |
| EQ25 | Biodiversity |
| EQ27 | Watercourses |
| EQ16 | Sites of Archaeological Interest |
| ST7 | Transport Assessments |
| ST9 | Managing Freight Transport |
| ST12 | Flooding |

3.3 Assessment of Key Local Plan Policies

Renewable Energy Policy

3.3.1 Policy ST20 'Renewable Energy Development' states that:

"The Council will support development required for the generation of energy from renewable sources, and the utilisation of renewable energy sources as part of new development, subject to assessment of proposals against other Local Plan policies. Renewable energy development will be viewed as an appropriate use in the countryside where there is an operational requirement for a countryside location." (page 79)

3.3.2 Policy ST20 is directly relevant to the proposed development and expresses support and encouragement for renewable energy developments. The policy requires all proposals to be assessed against other Local Plan policies. The proposed development is therefore assessed against the relevant policies of the plan in the remainder of this Chapter.

3.3.3 The proposed development is considered to be in accordance with Policy ST20 'Renewable Energy Development'.

Design Policy

3.3.4 Policy EQ1 'Sustainable Design Principles' states:

"New development will be required to achieve a high standard of design quality and compliance with principles of sustainable development." It adds that proposals should accord with a number of principles, the following of which are relevant:

- (1) *Natural and Built Heritage. Existing natural built or cultural heritage features should be identified, conserved, enhanced and integrated sensitively into development;*
- (2) *Urban and Landscape Design. The scale, siting and design of new development should respond positively and sympathetically to the site's surroundings, and create buildings and spaces that are attractive, safe and easy to use;*
- (3) *Accessibility. Development should be designed to encourage the use of sustainable, integrated transport and to provide safe access for all users;*
- (4) *Resource Use. Development should promote the efficient use of natural resources, and take account of life cycle costs, in terms of energy efficient design, choice and sourcing of materials, reduction of waste, recycling of materials and exploitation of renewable energy; and*
- (5) *Infrastructure. Infrastructure needs and their impacts should be identified and addressed by sustainable mitigation techniques, with regular regard to drainage, surface water management, flooding, traffic, road safety and noise."* (page 11)

3.3.5 A Design Concept Statement has been submitted in support of the proposed Renewable Energy Plant. This document demonstrates that an appropriate design approach has been adopted, and will be followed throughout the process, to result in a development that can integrate successfully with the surrounding environment and be developed in accordance with principles of sustainable development. The design approach has sought to achieve a high quality design concept that takes account of existing urban form, natural and built heritage features, and significant views and vistas.

3.3.6 The proposed development is industrial in nature and the main components of the development will be industrial in appearance. Given the location of the proposal within an operational port estate, the potential approach as illustrated in the Design Concept Statement, demonstrates how appropriate mitigation through design can result in a solution that is appropriate to the surroundings, with the potential for the proposal to become a noted addition to the area.

3.3.7 At this early stage in the design process no detail is available to consider the approach to life cycle costs, or detailed materials specification in terms of energy efficient design. The approach to the proposed development, as outlined in the Sustainability Statement, illustrates the incorporation of sustainable design principles in the concept and the future detailed design and operation of the Renewable Energy Plant.

3.3.8 The ES has considered the proposed development in terms of the potential effects arising from hydrology, transportation, and noise and has confirmed that in each case, no significant environmental effects will result.

3.3.9 The proposed development is considered to be in accordance with Policy EQ1 'Sustainable Design Principles'.

3.3.10 Policy EQ22 'Landscape and Visual Assessment' states:

"Development proposals which are likely to have a significant landscape impact must be accompanied by a comprehensive landscape and visual assessment as part of the Design Statement, which demonstrates that the setting is capable of absorbing the development, in conjunction with suitable landscape mitigation measures, and that the best environmental fit has been achieved, in terms of the landscape character of the area." (page 27)

3.3.11 As explained in section 2.4.19 above, the proposed development has been assessed and the detailed landscape and visual impact assessment is reported within Chapter 10 of the ES. The assessment concludes that there would be no significant landscape impacts. The proposed Renewable Energy Plant will result in four significant visual impacts. These are not considered to be unacceptable, and there is scope for additional offsite planting which has the potential to reduce the impact from two of these. Significant visual impacts identified from one of the views will only occur when a visual plume is present.

3.3.12 The proposed development is considered to be in accordance with Policy EQ22.

Land Use Policy

3.3.13 Policy EQ28 'The Coastal Zone' states:

"The Council will promote an integrated approach to the management of the coastal zone, and will support the provisions of the Forth Integrated Management Strategy. Development and other land management proposals within the coastal zone will be assessed in terms of:

1. *Impacts on the amenity, ecology and water quality of the coastal environment (see Policies EQ24 and EQ25);*
2. *The requirement to safeguard the undeveloped coast, as defined on the Proposals Map, from further development unless it is proven that the development is essential, a coastal location is essential, and no suitable sites exist within the developed coast;*
3. *Long-term flooding risk (see Policy ST12), and compatibility with existing coastal defence strategies, including the desirability of working with natural coastal processes where possible and the need to recognise the wider impacts where intervention is unavoidable; and*
4. *Appropriate promotion of the recreational potential of the coastal zone, including the development of the Forth Foreshore Path and linked coastal access networks, providing it is compatible with Policy EQ24 and the protection of coastal habitats and species."* (page 31)

3.3.14 Given the location and nature of the proposed Renewable Energy Plant, the criteria of relevance are 1 and 3.

3.3.15 In terms of the first criterion, the statutory designations are referred to in Section 2.4 above in relation to Structure Plan policy, where ES Chapter 12, 'Terrestrial Ecology' is noted to conclude that the proposed development is not predicted to result in any significant adverse effects on ecological receptors of local or higher value, notable habitats and designated sites. In addition, ES Chapter 13, 'Aquatic Ecology', concludes that there are no significant effects on aquatic life.

3.3.16 Chapter 14 'Hydrology, Hydrogeology, Geology and Soils' notes that no significant environmental effects have been identified in terms of impacts to the hydrological or hydrogeological environment.

Therefore, overall, the proposed Renewable Energy Plant will not result in any significant effects on the water environment.

3.3.17 In relation to the third criterion, the application site is a man made port and the area of the port where the proposed development is to be sited is not affected by coastal erosion. The application site is, however, located within an area deemed by SEPA to be at risk from tidal inundation from the Forth Estuary. The floodplain mapping provided by SEPA indicates that the application site is within a 1 in 200 year flood risk area, which indicates a medium to high flood risk (though there is no recent evidence of significant flooding in the port). It is necessary for the proposed development to be located within a Port environment, therefore there are no suitable alternative sites. To mitigate against flood risk, it is proposed to locate development components that require personnel attendance at above 5.464 AOD as well as all equipment which would be sensitive to flood events. The flood risk to the site can be managed appropriately, and the proposed development can therefore be considered to be in accordance with criterion 3.

3.3.18 The proposed development is considered to be in accordance overall with Policy EQ28 'The Coastal Zone'.

3.3.19 **Policy EP1 'Strategic Development Opportunities'** states:

"The Council will give priority to the sites detailed in Table 5.1 as the site-specific parts of the Strategic Development Opportunities identified with Policy ECON.1 and Schedule ECON.1 of the Structure Plan. These should be developed in accordance with the principles set out in Structure Plan Policy ECON.2." (page 49)

3.3.20 Grangemouth Docks (ED.GRA2-4) is identified as a Strategic Development Opportunity in Table 5.1 in the Local Plan (page 50). Part of the application site is designated as ED.GRA4 under Policy EP1.

3.3.21 The Local Plan refers to Opportunity ED.GRA 4 Grangemouth Docks – Zone 4 for 'Port Related General Industrial/Storage' development on a site of 35.3 ha. The amended text for this opportunity following proposed pre-inquiry modifications by the Council and the approval of the Reporter's recommendations is as follows:

"Land identified for port related development. A transport assessment would be required, and off-site contributions to upgrading of motorway junctions may be required. Proposals must have no adverse impact on the integrity of the adjacent Firth of Forth SPA. In particular control should be exercised over construction activities likely to cause disturbance from September to March. Project based appropriate assessment may be required for discrete projects once more detail on uses is available. The Habitats Regulations will apply to any detailed proposal (see tests in Policy EQ24(1). Site has been identified as being at medium to high risk of flooding. A flood risk assessment and drainage impact assessment will be required. These assessments may influence the scale, layout and form of development." (page 159).

3.3.22 The Finalised Draft Local Plan, incorporating the Council's proposed pre-inquiry modifications and approved Reporter's recommendations, provides further land use information as detailed below.

Grangemouth Docks

"The Falkirk Council Structure Plan identified the extensive areas of vacant land at Grangemouth Docks as one of nine Strategic Development Opportunities within the Council area. The range of intended uses were listed as: office, industry, distribution, leisure, tourism, retail, residential, new railway station and port related activities.

The Local Plan splits the docks into four zones and provides a general framework for a mix of uses. These are set out under proposals ED.GRA2-ED.GRA4. The potential constraints to redevelopment include ground conditions, access, servicing health and safety, impact on Firth and Forth SPA and marketing. Bearing these

in mind the acceptable uses have been deliberately designed to be as flexible as possible whilst still ensuring the development meets wider objectives.

Zone 1 covers the northwards expansion of the Town Centre which has been developed as a retail superstore, petrol filling station and fast food restaurant. Zones 2, 3 and 4 are identified for port-related general industry and storage, whilst retaining flexibility for more mixed use in Zones 2 and 3 should industrial development not be pursued by Forth Ports.” (paragraphs 7.5 – 7.7, page 157)

3.3.23 As noted in section 2.4.28 above, the proposed development is in accordance with Policy ECON.1. The proposed development is also in accordance with Policy ECON.2: ‘Strategic Development Opportunities – Development Criteria’.

3.3.24 On this basis, the proposed development is considered to be in accordance with Policy EP1 ‘Strategic Development Opportunities’.

3.3.25 **Policy EP2 ‘Land for Business and Industrial Use’** (incorporating the Council’s proposed pre-inquiry modifications and approved Reporter’s recommendations) states:

“In order to maintain the business and industrial land supply and the employment role of existing business and industrial areas:

- (1) The sites for new business and industrial development identified on the Proposals Map will be safeguarded for the employment use specified for each site; and*
- (2) The areas of retention in business and industrial use identified on the Proposals Map will be retained and reserved for Class 4, 5 or 6 uses, except for the established business parks of Callendar Park and Gateway Business Park, Grangemouth which will be reserved for Class 4 uses only and the Glasgow Road Camelon Industrial Area which may include a food retail element as part of the mix.*

Other ancillary employment uses may be permitted within these areas where they are compatible with the principal business/industrial use of the site, will not result in a significant reduction in the availability of business land or property, and are consistent with other Local Plan policies.” (page 51)

3.3.26 Part of the application site is covered by policy ‘EP2 (2) Land for Business and Industrial Use’. The nature of the land use of the proposed Renewable Energy Plant is considered to be in accordance with Policy EP2 ‘Land for Business and Industrial Use’.

3.3.27 **Policy EP4 ‘Business and Industrial Development within the Urban and Village Limits’** states:

- (1) “New business and industrial development, or extensions to such uses, will be supported within the business areas highlighted in Policy EP2 and EP3 (1), where it accords with the use specified for the area and is compatible with the established level of amenity in the business area, and protected habitats and species are safeguarded in accordance with Policy EQ24....”.*
- (2) Outwith these areas, proposals within the Urban Limit will not be permitted where the nature and scale of the activity will be compatible with the surrounding area, there will be no adverse impact on neighbouring uses or residential amenity, and the proposal is satisfactory in terms of access, parking and traffic generation.” (page 52)*

3.3.28 As noted in 3.3.26 above, the proposed Renewable Energy Plant is in accordance with Policy EP2. It is also in accordance with Policy EQ24, as detailed in 3.3.36 below. The proposed development is therefore in accordance with criterion (1) of Policy EP4 'Business and Industrial Development within the Urban and Village Limits'.

3.3.29 In relation to criterion (2) of the policy, the proposed development is industrial in nature and is compatible with the existing surrounding uses. As detailed in Chapter 11 'Noise and Vibration' of the ES, there would be no significant adverse effects on residential amenity. The Transport Statement has confirmed the suitability of the road network of interest to accommodate the likely volumes of traffic expected as a result of the proposed development during all stages of its lifecycle.

3.3.30 The proposed development is considered to be in accordance with Policy EP4 'Business and Industrial Development within the Urban and Village Limits'.

3.3.31 **Policy EP18 'Major Hazards'** states:

"Within the Major Hazard and Pipeline Consultation Zones identified on the Proposals Map, proposals will be judged in relation to the following criteria:

- (1) The increase in the number of people exposed to risk in the area, taking into account the advice of the Health & Safety Executive, any local information pertaining to the hazard, and the existing permitted use of the site or buildings; and*
- (2) The extent to which the proposal may achieve regeneration benefits, which cannot be secured by any other means." (page 61)*

3.3.32 In addition to the above criteria, the Council has accepted the Local Plan Inquiry Reporter's recommendation to add a third criterion as follows:

"(3) the potential impact that the proposals may have upon chemical and petro-chemical establishments."

3.3.33 The application site is within a Major Hazard Zone but not within the Pipeline Consultation Zone. Through consultations with the Health and Safety Executive (HSE) it has been established that the proposed development is acceptable with regard to its proximity to hazard sites, as the type of proposed development and number of persons to be working within the site are within the acceptable threshold. The proposed development is found, therefore, to be in accordance with this policy.

Natural Heritage Policy

3.3.34 **Policy EQ24 'Ecological Sites and Features'** addresses the consideration of natural heritage interests in relation to development proposals. Relevant components of the policy (incorporating the Council's proposed pre-inquiry modifications) include the following:

- (1) "Development likely to have a significant effect on Natura 2000 sites (including Special Protection Areas, Special Areas of Conservation, and Ramsar Sites) will be subject to an appropriate assessment. Where an assessment is unable to conclude that a development will not adversely affect the integrity of the site, development will only be permitted where there are no alternative solutions; and there are imperative reasons of overriding public interest, including those of a social or economic nature except where the site has been designated for a European priority habitat or species. Consent can only be issued in such cases where the reasons for overriding public interest relate to human health, public safety, beneficial consequences of primary importance for the environment or other reasons subject to the opinion of the European Commission (via Scottish Ministers).*

- (2) *Development affecting Sites of Special Scientific interest will not be permitted unless it can be demonstrated that the overall objectives of the designation and the overall integrity of the designated area would not be compromised, or any adverse effects are clearly outweighed by social or economic benefits of national importance.*
- (3) *Development affecting Wildlife Sites, Sites of Importance for Nature Conservation, Local Nature Reserves, wildlife corridors and other nature conservation sites of regional or local importance will not be permitted unless it can be demonstrated that the overall integrity of the site will not be compromised, or any adverse effects are clearly outweighed by social or economic benefits of substantial local importance.*
- (4) *Development likely to have an adverse effect on species which are protected under the Wildlife and Countryside Act 1981, as amended, the Habitats and Birds Directives, or the Protection of Badgers Act 1992, will not be permitted.*
- (5) *Where development is to be approved which could adversely affect any site of significant nature conservation value, the Council will require mitigating measures to conserve and secure future management of the site's natural heritage interest. Where habitat loss is unavoidable, the creation of replacement habitat to compensate for any losses will be required along with provision for its future management.” (page 28).*

3.3.35 The statutory designations are explored above in relation to Structure Plan policy, where ES Chapter 12, ‘Terrestrial Ecology’ is noted to conclude that the proposed development is not predicted to result in any significant adverse effects on ecological receptors of local or higher value, notable habitats and designated sites.

3.3.36 In this regard, the proposed development is considered to be in accordance with Policy EQ24.

3.3.37 **Policy EQ25 ‘Biodiversity’** states:

“The Council will promote the biodiversity of the Council area and ensure that the aims and objectives of the Falkirk Area Biodiversity Action Plan are promoted through the planning process. Accordingly:

- (1) *Developments which would have an adverse effect on the national and local priority habitats and species identified in the Falkirk Area Biodiversity Action Plan will not be permitted unless it can be demonstrated that there are overriding national or local circumstances;*
- (2) *The safeguarding, enhancement and extension of the broad and key habitats and the species of conservation concern identified in ‘The Biodiversity of Falkirk’ will be given particular attention in the consideration of development proposals;*
- (3) *Development proposals should incorporate measures to promote, enhance and add to biodiversity, through overall site planning, and infrastructure, landscape and building design, having reference to the Supplementary Planning guidance Note on ‘Biodiversity and Development’.; and*
- (4) *Priority will be given to securing appropriate access to and interpretation of areas of local nature conservation interest. The designation of Local Nature Reserves, in consultation with communities, local wildlife groups and statutory bodies will be pursued.” (page 29)*

3.3.38 Chapter 12, ‘Terrestrial Ecology’ of the ES concludes that the proposed development would not have an adverse effect on the national and local priority habitats and species identified in the Falkirk Area Biodiversity Action Plan.

3.3.39 The proposed development is considered to be in accordance with Policy EQ25 'Biodiversity'.

3.3.40 **Policy EQ27 'Watercourses'** considers the potential impact on watercourses from development proposals. Key aspects of the policy of relevance to the proposed development include the following:

"The Council recognises the importance of watercourses within the Council area in terms of their landscape, ecological, recreational and land drainage functions. Accordingly:

(1) There will be a general presumption against development which would have a detrimental effect of the landscape integrity, water quality, aquatic and riparian ecosystems, or recreational amenity of watercourses. Development proposals adjacent to a watercourse should provide for a substantial undeveloped and suitably landscaped riparian corridor to avoid such impacts;

(3) There will be general presumption against the culverting of watercourses." (page 30).

3.3.41 ES Chapter 14, 'Hydrology, Hydrogeology, Geology and Soils' states that no significant environmental effects have been identified in terms of impacts to the hydrological or hydrogeological environment.

3.3.42 As stated in ES Chapter 13, 'Aquatic Ecology', the proposed Renewable Energy Plant is predicted to result in no significant effects on aquatic life.

3.3.43 The proposed development is considered to be in accordance with Policy EQ27 'Watercourses'.

Built Heritage Policy

3.3.44 **Policy EQ.16 'Sites of Archaeological Interest'** states:

(1) Scheduled ancient monuments and other identified nationally important archaeological resources shall be preserved in situ, and within an appropriate setting. Developments which have an adverse effect on scheduled monuments or the integrity of their setting shall not be permitted unless there are exceptional circumstances;

(2) All other archaeological resources shall be preserved in situ wherever feasible. The Council will weigh the significance of any impacts on archaeological resources and their settings against other merits of the development proposals in the determination of planning applications; and

(3) Developers may be requested to supply a report of an archaeological evaluation prior to determination of the planning application. Where the case for preservation does not prevail, the developer shall be required to make appropriate and satisfactory provision for archaeological excavation, recording, analysis and publication, in advance of development". (page 21)

3.3.45 ES, Chapter 15 'Cultural Heritage', reports that the proposed development will not result in any significant adverse effects on any Scheduled Ancient Monuments or other nationally important archaeological resources and their settings. Table 15.10 in the ES summarises the potential impacts of the proposed Renewable Energy Plant upon cultural heritage features resulting from its construction, operation and decommissioning. The ES identifies that there will be no significant adverse effects arising from the proposed development on any cultural heritage features and their settings, including Historic Docks and the Antonine Wall. Furthermore, the ES notes that it is considered that there is limited potential for an impact of moderate significance on previously unrecorded maritime archaeological features.

3.3.46 The proposed development is considered to be in accordance with Policy EQ16 'Sites of Archaeological Interest'.

Transport Policy

3.3.47 **Policy ST7 'Transport Assessments'** (incorporating the Council's proposed pre-inquiry modifications) states:

- (1) *Falkirk Council will require transport assessments of developments where the impact of that development on the transport network is considered likely to require mitigation.*
- (2) *Transport assessments will include travel plans and, where necessary, safety audits of proposed mitigation measures and assessment of the likely impacts on air quality as a result of proposed development.*
- (3) *Developers will agree the scope of the assessment with Falkirk Council, then undertake the assessment in accordance with the scoping. In all cases, the assessment will focus on the hierarchy of transport modes, favouring the use of walking, cycling and public transport over unnecessary use of the car.*
- (4) *The Council will only grant planning permission where it is satisfied that the transport assessment and travel plan has been appropriately scoped, the network impacts properly defined and suitable mitigation measures identified." (page 70)*

3.3.48 A Transport Statement has been prepared for the proposed development and this has considered the existing background conditions. Potential traffic generation arising from the construction, operation and decommissioning of the proposed renewable Energy Plant has been assessed.

3.3.49 The Transport Statement has confirmed the suitability of the road network to accommodate the likely volumes of traffic expected as a result of the proposed development during all stages of its lifecycle.

3.3.50 The proposed development is considered to be in accordance with Policy ST7 'Transport Assessments'

3.3.51 **Policy ST9 'Managing Freight Transport'** states:

- (1) *"Freight intensive development will be directed to locations that can be accessed without significant impact on local communities, or on the local and strategic road network. Areas with rail or sea access, notably Grangemouth Docks and the connecting branchline, will be particularly favoured.*
- (2) *Development which will encourage the transfer of freight from road to rail, including the development of freight handling facilities, will be supported subject to other Local Plan policies.*
- (3) *Signage strategies, junction improvements and network upgrades will be considered where these contribute to improved access for freight." (page 71).*

3.3.52 The proposed development would involve the transport of the majority of fuel and materials to the site by sea and will make use of existing port infrastructure. The proposed development is considered to be in accordance with Policy ST9 'Managing Freight Transport'.

Flooding and Drainage Policy

3.3.53 **Policy ST12 'Flooding'** states:

"There will be a presumption against new development which would be likely to be at risk, would increase the level of risk for existing development or would be likely to require high levels of public expenditure on flood protection works. Applicants will be required to provide information demonstrating that any flood risks can be adequately managed both within and outwith the site."

- 3.3.54 As explained in sections 2.4.45–48 above, ES Chapter 14 ‘Hydrology, Hydrogeology, Geology and Soils’, confirms that the application site lies within an area that is potentially at medium to high risk of coastal flooding.
- 3.3.55 Mitigation measures have been proposed to protect development components that require personnel attendance and all equipment which would be sensitive to flood events against flood risk. The flood risk to the site can be appropriately managed in terms of the site itself, and the potential of flooding on other surrounding sites.
- 3.3.56 The proposed development is considered to be in accordance with the objectives of Policy ST12 ‘Flooding’.

3.4 Conclusions

- 3.4.1 The proposed Renewable Energy Plant has been reviewed against the Local Plan's 'aims and objectives' and it is considered that the proposed development is clearly consistent with, and would further these.
- 3.4.2 In this regard it is particularly relevant to note the predicted quantifiable environmental and economic benefits of the proposed development, the scale of renewable electricity and heat generation that would result, the sustainable mode of transporting fuel, the reuse of previously developed industrial land, and the proposed mitigation measures set out within the ES.
- 3.4.3 Policy ST20 'Renewable Energy Development' is the Council's policy for the support and encouragement of renewable energy developments.
- 3.4.4 The other Local Plan policies considered above examine specific planning matters, applicable to a wide range of development types and the associated effects of development. The environmental effects (both positive and adverse) and the economic benefits that would arise from the proposed development have been considered in the context of these policies. The only residual significant effects resulting from the proposed development relate to visual matters, none of which are considered unacceptable, and there is the potential to further mitigate these by means of off site planting.
- 3.4.5 It is concluded that the proposed development is supported by the policies of relevance and it is in accordance with the policy objectives that establish the local land use policy framework as set out in the Local Plan.

4 Material Considerations

4.1 Introduction

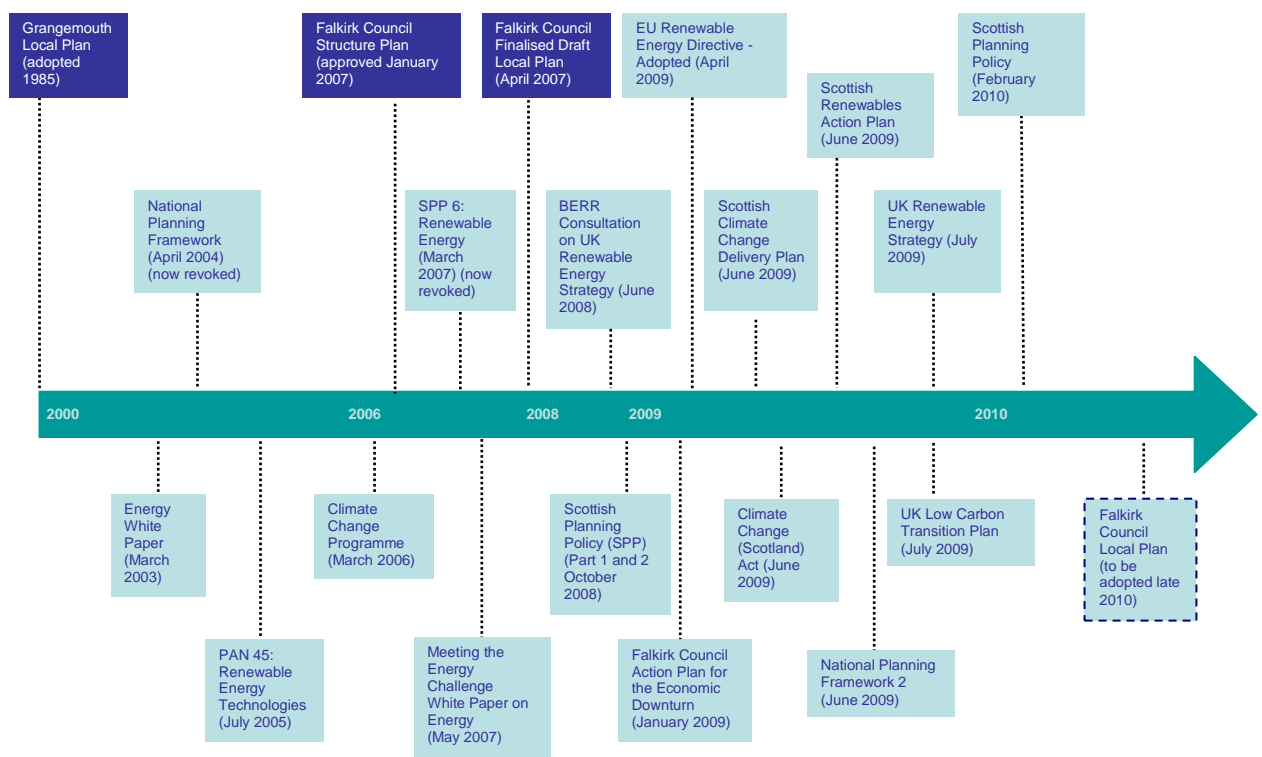
4.1.1 This chapter provides an assessment of the proposed Grangemouth Renewable Energy Plant in terms of relevant material considerations.

4.1.2 Chapter 4 of the ES outlines the renewable energy policy context and its relevance in relation to the proposed development, while Chapter 5 (Planning Policy) sets out relevant national planning policies, advice and guidance as relevant to the proposed development. This Chapter adds to this and refers to other relevant material considerations. This Chapter summarises and refers to:-

- The Need Case and Renewable Energy Policy;
- The National Planning Framework 2;
- Scottish Planning Policy (SPP);
- Planning Advice Notes (PANs);
- The National Renewable Infrastructure Plan;
- The Combined Heat and Power potential of the proposed development;
- The Sustainability Statement in support of the proposed development;
- The Emerging Development Plan; and
- The Falkirk Council Action Plan for the Economic Downturn.

4.1.3 Some material considerations may post-date the statutory Development Plan. This can affect the weight that may be attributed to them in an assessment of the overall policy context. Figure 4.1 below illustrates a 'timeline' of the statutory Development Plan in relation to identified material considerations.

Figure 4.1: Dates of the statutory Development Plan & Timeline of Material Considerations



- 4.1.4 It can be seen from Figure 4.1 that there are a wide range of recent planning and renewable energy policy documents which constitute relevant material considerations, a number of which are of considerable weight in the decision-making process.

4.2 The Need Case: European and UK Renewable Energy Policy

- 4.2.1 This section presents some detail on the climate change and renewable energy policy background for the proposed development by explaining the renewable energy policy context at a European, UK Government level. The following section refers to Scottish Government renewable energy policy.
- 4.2.2 The need for the proposed development is a very important material consideration. In this section, specific reference is made in the need case to national renewable energy targets. The proposed development would have an estimated energy generating capacity of 100 MWe and would contribute to Scottish, UK and European level renewable energy generation targets.
- 4.2.3 Increasing the role of renewable energy generation, by means such as the proposed Renewable Energy Plant, can contribute to achieving greenhouse gas reduction targets by displacing the carbon dioxide emissions from conventional fossil fuel fired generating plant. Biomass is a recognised form of renewable energy. By operating additional renewable capacity, the need to operate fossil fuelled plant will decrease, with a consequent reduction in fuel consumption and associated carbon dioxide emissions.
- 4.2.4 Renewable energy forms one element of a wider climate change strategy, which includes energy efficiency, the development of carbon trading and promotion of more sustainable transport policies and measures.

European Policy

- 4.2.5 In January 2008 the European Commission published the '20 20 by 2020' package³. This included proposals for reducing the EU's greenhouse gas emissions by 20% from 1990 levels and increasing the proportion of final energy consumption from renewable sources to 20%. Both targets are to be achieved by 2020.
- 4.2.6 As part of the 20 20 by 2020 package, a Renewable Energy Directive⁴ from the European Commission which requires significant increases in renewable energy production was published in its final form in March 2009 and is legally binding.
- 4.2.7 The UK Government has also published a strategy (DECC, 2009) in order to implement the obligations contained within the EU Renewable Energy Directive: this is referred to further below.
- 4.2.8 The 20% target with respect to renewable energy is split between Member States. For the UK, the European Commission's proposals include 16% reduction in UK greenhouse gas emissions by 2020 and for 15% of all energy consumed in the UK to come from renewable sources by 2020.

United Kingdom Policy

- 4.2.9 The UK Government retains control of the overall direction of energy policy. Since devolution in 1999, some energy policy issues have been devolved to Scotland such as energy efficiency and renewable energy (including planning consents for the construction and operation of generating plants covered by the Electricity Act 1989).

³ EU Climate Change and Energy Package, European Commission (January, 2008).

⁴ Directive of the European Parliament and of the Council on the Promotion of the use of Energy from Renewable Sources (2009).

4.2.10 Encouraging more electricity generation from renewable sources is an important element of both the UK and Scottish Climate Change Programmes⁵.

4.2.11 As noted in section 1.3, the EU Renewable Energy Directive provides the framework for achieving the EU targets. The UK Climate Change Act became law on 26 November 2008 and sets legally binding targets for the UK to achieve an 80% reduction in greenhouse gas emissions by 2050 and reductions on CO₂ emissions of at least 26% by 2020 from 1990 baseline levels.

4.2.12 In this section, reference is made to:

- The UK Biomass Strategy;
- The UK Renewable Energy Strategy;
- The UK Low Carbon Transition Plan;
- The Renewables Obligation.

UK Biomass Strategy (2007)

4.2.13 The UK Biomass Strategy⁶ was published in 2007 in parallel with the Government's Energy White Paper⁷. The Strategy defined for the first time, the UK Government's policies on biomass for industry, energy and transport in a single document. The strategy stated that biomass will have a central role to play in meeting the EU target of 20% renewable energy consumption by 2020. The Government strategy for biomass is intended to:-

- Realise a major expansion in the supply and use of biomass in the UK;
- Facilitate the development of a competitive and sustainable market and supply chain;
- Promote innovation and low carbon technology developments where biomass can deliver relatively higher energy yields;
- Facilitate a shift towards a bio-economy through sustainable growth and development of biomass use for fuels and renewable materials;
- Maximise the potential of biomass to contribute to the delivery of our climate change in energy policy goals; and
- To reduce CO₂ emissions, and achieve a secure, competitive and affordable supply of fuel. (Page 5)

4.2.14 The delivery of the Strategy "*will require a major expansion of biomass use and sustainable supply*" (page 5). The Government makes it clear that the import of biomass feedstock will continue to play a significant role in meeting UK energy needs and in particular in meeting the demand for biomass that the strategy will create.

4.2.15 In terms of biomass for energy, the Strategy emphasises the Government wishes to increase the use of biomass as an energy source. It states that biomass is an important tool for tackling climate change as well as offering new commercial opportunities, (para 2.1).

4.2.16 In term of electricity generation, reference is made in the Strategy at Section 3.9 to the Renewables Obligation. It is highlighted that biomass has an important role to play in achieving the UK renewable electricity generation targets, both through co-firing and the use of dedicated biomass generation.

4.2.17 The contribution that biomass can make to renewable heat (and cooling) is also set out in the Strategy. It states that renewable heat, partly, but not entirely sourced from biomass (as of 2007) only accounted

⁵ The UK Climate Change Programme (March 2006) , The Scottish Climate Change Programme, 'Changing our Ways' (November 2006) & Scottish Government Climate Change Delivery Plan 'Meeting Scotland's Statutory Climate Change Targets' (June 2009).

⁶ Department for Environment, Food and Rural Affairs (DEFRA), May 2007.

⁷ The Energy White Paper, Meeting the Challenge (May, 2007).

for approximately 1% of heat supply in the UK. Imported biomass is also highlighted as playing a part in the development and expansion of the biomass heat sector.

4.2.18 The Strategy makes a cross reference to the Scottish 'Biomass Action Plan' which was published in March 2007 and this is referred to in more detail below.

4.2.19 The proposed Renewable Energy Plant would help attain a major expansion in the supply and use of biomass in the UK in line with the UK Biomass Strategy.

UK Renewable Energy Strategy (2009)

4.2.20 In light of the significant increase in renewable energy required by the EU Renewable Energy Directive, the UK Renewable Energy Strategy (UKRES) was issued by the Department of Energy and Climate Change (DECC) in July 2009.

4.2.21 The UKRES aims to implement the obligations contained within the EU Renewables Directive and to thereby result in a significant increase in the contribution that renewable energy makes to energy generation in the UK. The UKRES sets out the Government's comprehensive action plan for delivering the 'renewables revolution'. The document sets out the balance of fuels and technologies that is most likely to achieve this challenging goal and the strategic role that the UK Government will adopt and the specific actions intended to lead delivery.

4.2.22 The UKRES states that the UK needs to radically increase the use of renewable electricity. The document sets out the means by which the UK can meet the legally binding target of 15% of energy consumption from renewable sources by 2020. This will mean a seven-fold increase in the share of renewables in little more than a decade.

4.2.23 The UKRES sets out interim targets leading up to 2020. Paragraph 2.36 of the UKRES states that there needs to be sufficient progress made each year to remain on track to achieve the 2020 target. Under the Renewable Energy Directive, the UK interim targets for renewables in the energy mix are as follows:

- 4% in 2011-12;
- 5.4% in 2013-14;
- 7.5% in 2015-16;
- 10.2% in 2017-18.

4.2.24 The UKRES highlights (paragraph 2.38) that the earliest interim target (2011-12) will be the most challenging.

4.2.25 The UKRES states that 30% of electricity should be generated from renewables in the UK by 2020, which would be up from approximately 5.5% in 2009. This is expected to come from a range of renewable technologies. Bioenergy used in electricity is expected to make an important contribution of approximately 22% of renewable electricity generation (7% of total electricity demand⁸). In terms of the increased deployment of renewable heat, 12% of heat demand should be generated from renewable sources by 2020 (UKRES, para 2.7).

4.2.26 The UK Government is committed to ensuring that the appropriate regulatory and financial frameworks are in place to enable the market to deliver the required increase in renewable energy. In terms of financial support, the Strategy sets out a framework of long term, comprehensive and targeted financial support. The Renewables Obligation (RO) is to remain the key mechanism for incentivising renewable electricity and Scottish and Southern Energy plc is subject to the RO. The RO is to be expanded and

⁸ The UKRES notes that this estimate is modelled on dedicated biomass, co-firing, landfill gas and energy from biomass waste electricity and CHP plant incentivised under the Renewable Obligation (RO).

extended to ensure it can deliver approximately 30% renewable electricity by 2020. The RO is to be extended beyond its current end date of 2027 until 2037 for new projects (UKRES, Chapter 3, page 55).

- 4.2.27 The UKRES is expected to deliver significant environmental benefits, in particular by contributing to global action against climate change. It recognises that there will also be some pressures on the local environments and natural heritage from new infrastructure provision.
- 4.2.28 In terms of economic and employment opportunities, these are highlighted and the aspiration is for the UK to be at the forefront of global competition in the low carbon economy. The Government estimates that the Strategy will:-
- Put the UK on a path towards decarbonising the production of energy in the UK, alongside nuclear and carbon capture and storage.
 - Contribute to the security of energy supplies in the UK through reducing demand for fossil fuels of around 10% and gas imports by between 20 – 30% against forecast use in 2020.
 - Bring outstanding business opportunities and enable the UK to restructure into a low carbon economy, providing around £100 billion of investment opportunities and contribute to the creation of up to 0.5 million more jobs in the UK renewable energy sector.
- 4.2.29 The UKRES is also intended to tackle climate change, reducing the UK's emissions of carbon dioxide by over 750 million tonnes between now and 2030. It will also promote the security of the UK's energy supply, reducing overall fossil fuel demand by around 10% and gas imports by 20–30% against what they would have been in 2020.
- 4.2.30 The UKRES highlights that there is a need to use more sustainable bioenergy and that the supply and use of biomass for heat and power needs to be increased significantly.
- 4.2.31 Paragraph 53 of the document makes it clear that the UKRES is an integral part of the Government's overall UK Low Carbon Transition Plan (referred to in the following paragraphs).
- 4.2.32 Section 6 of the document states that the Devolved Administrations have a leadership role to undertake. The UKRES as a whole is published by the UK Government and that the policies to meet the 2020 targets will be taken forward in England, Scotland and Wales, Great Britain or on a UK – wide basis as appropriate and in accordance with each devolution arrangement. The UKRES makes it clear that there has been close engagement with the Devolved Administrations in developing the Strategy and that this close working will continue in implementing the policies set out in the UKRES. This will include the development of the UK National Action Plan to facilitate meeting the 2020 targets. The document makes it clear that each of the Devolved Administrations is setting out its own plan to increase renewable energy use and that *“the UK Government and the Devolved Administrations are working together to ensure that our plans are aligned”* (UKRES, para 8.18).
- 4.2.33 Given the scale of the proposed Renewable Energy Plant will deliver an output of 100 MWe, it will make a significant contribution to the UK target for renewable electricity generation and will help attain the various objectives set out in the UKRES.

The UK Low Carbon Transition Plan (2009)

- 4.2.34 Along with the UKRES, the UK Government published the UK Low Carbon Transition Plan, as a White Paper in July 2009.
- 4.2.35 The White Paper sets out the UK's first ever comprehensive low carbon transition plan to 2020. The plan seeks to deliver greenhouse gas emission cuts of 18% on 2008 levels by 2020 (and over a third reduction on 1990 levels).

- 4.2.36 The White Paper emphasises that the UK will need to drive major changes to the way energy is used and supplied (page 5). It seeks to ensure that the UK will get 40% of electricity from low carbon sources by 2020, with policies to produce approximately 30% of UK electricity from renewables by 2020, by substantially increasing the requirement for electricity suppliers to sell renewable electricity.
- 4.2.37 The White Paper explains that the UK Government has put in place the world's first legally binding target to cut carbon emissions by 80% by 2050 (as required by the Climate Change Act 2008) and it has set five year 'carbon budgets' to 2022 to 'keep the UK on track' and which provide a clear pathway for reducing emissions in the future (page 6). The White Paper for the first time sets out how these budgets will be met.
- 4.2.38 The White Paper explains that carbon budgets are a limit on the total quantity of greenhouse gas emissions over a five year period. They are intended to reflect the fact that the UK's overall contribution to reducing global greenhouse gas emissions is determined by emissions into the atmosphere over time, not by meeting specific targets in specific years. The carbon budgets will provide an opportunity for scrutiny by reporting each year on progress and will ensure that the policy framework for the UK is guided by an evidence base.
- 4.2.39 In terms of carbon savings to 2020, the Government announced the first three budgets, covering the periods 2008 – 12, 2013 – 17 and 2018 – 22 in April 2009. The White paper states that the carbon budgets will be challenging. The final budget period centred on 2020 requires a 34% cut on 1990 levels.
- 4.2.40 The White Paper refers to 'transforming our power sector' and states that the Transition Plan, along with wider policies, will result in some 40% of electricity coming from low carbon sources by 2020 (Summary, page 4). Sources will be such as renewables, nuclear and fossil fuel coal generation fitted with carbon capture and storage technology.
- 4.2.41 Again, the proposed Renewable Energy Plant will make a significant contribution to the UK target for renewable and low carbon electricity generation and will help attain the various objectives set out in the UK Low Carbon Transition Plan.

Renewables Obligation and Renewable Heat Incentive

- 4.2.42 The Renewables Obligation (RO) is a Government mechanism designed to incentivise the production of renewable electricity. The wider powers enabling the creation of an obligation on suppliers are reserved to the UK Government; however, the Scottish Government has devolved powers which enable it to deliver the RO in Scotland.
- 4.2.43 Electricity supply companies (Suppliers) are required to supply annually, an increasing percentage of the energy supplied to customers from eligible renewable sources. To demonstrate that renewable energy has been supplied to customers, suppliers have to either surrender Renewable Obligation Certificates (ROCs) or pay a 'buy out' fee. Any buyout fees collected are re-distributed to the Generators of renewable energy in relation to their share of the total annual renewable energy volume produced.
- 4.2.44 Renewable Obligation Certificates (ROCs) are issued monthly to generators of renewable energy and these ROCs can be bought by, and sold to anyone. To avoid paying the buyout fee, Suppliers are encouraged to either to generate their own renewable electricity to get ROCs directly, or to purchase ROCs from others who have generated the renewable electricity. Technologies that are currently eligible for ROCs are: biomass; onshore wind; offshore wind; new hydro; refurbished hydro; solar; wave and tidal; private micro hydro, and landfill gas generators.

- 4.2.45 The focus of the RO has been radically altered and is no longer technology neutral. Banding has been introduced to give increased incentives to developing renewable technologies resulting in some technology bands receiving more ROCs, while those in others receive less.
- 4.2.46 Biomass generation has benefited from banding and currently receives 1.5 ROCs per MWh for producing electricity and an extra ½ ROC i.e. a total of 2.0 ROCs per MWh, if it can deliver a minimum qualifying level of heat as well as power i.e. the plant is considered to be a [Good Quality] Combined Heat and Power plant (GQCHP).
- 4.2.47 It is currently proposed by Government, to remove the additional incentive (extra ½ ROC) for supplying a qualifying level of heat (GQCHP) from the RO and to establish a separate incentive mechanism for heat alone. This new mechanism is being called the Renewable Heat Incentive (RHI). As explained in the Department of Energy and Climate Changes' consultation on the RHI carried out in early 2010, the features of this new RHI mechanism are still being developed and are expected to be introduced in April 2011.
- 4.2.48 Based on at present customer levels, Scottish and Southern Energy's (SSE) current renewable obligation equates to approximately 11 GWh (Terrawatt hours), or the output from approximately 2,000 MW of renewable generation⁹.
- 4.2.49 In 2009 SSE surrendered 3.2TWh of ROCs which is equivalent to 17% of the total ROCs produced. The remainder of the obligation was met by paying the buy-out fee¹⁰.
- 4.2.50 The framework of Renewable Obligations is creating significant demand for renewable generation and the market has reacted by bringing forward proposals for new renewable plant. In this regard there is a needs case separate from overall Government targets, relating to licensed suppliers (such as SSE) with a legal obligation that must be fulfilled otherwise penalties will be applied. Therefore, there is justification and need for the development related to Government policy but arising out of a separate legal obligation that seeks to bring about the policy change of increasing the proportion of electricity to be supplied from renewable sources. This can properly be regarded as a relevant and material consideration.

Security and Diversity of Supply

- 4.2.51 In addition to the need for new renewable energy generation to reduce emissions of greenhouse gases, the UK also requires new electricity generating plant to ensure the future security of supply. The UK Low Carbon Transition Plan¹¹, referred to above, anticipates that by 2018 about sixteen power plants (equating to 18 Gigawatt (GW), i.e. about 25% of the current installed capacity) will have closed.
- 4.2.52 With the current and planned closures of this large number of power plants, a significant number of new power plants are required to ensure energy security. The UK will therefore need rapid and substantial investment in new generation capacity to replace these closures.
- 4.2.53 The need to secure the UK's energy supply is a key theme of government energy policy as the UK's indigenous energy production declines and diversity in fuel sources is recognised as an important contributor to security of supply. A diverse mix of low carbon technologies helps deliver energy security by reducing the risk of problems that may arise with one type of technology or fuel. The Grangemouth Renewable Energy Plant contributes to this policy objective through the large scale use of renewable fuel.

⁹ Assuming a generation load factor of 60%.

¹⁰ Renewable Obligation: Annual Report, 2008/09 Ref 32/10 (8 March 2010).

¹¹ Low Carbon Transition Plan (DECC, 2009), page 73.

4.3 The Need Case: Scottish Government Renewable Energy Policy

4.3.1 In this section, reference is made to:

- The Scottish Government Renewable Energy and Heat Targets;
- The Biomass Action Plan for Scotland;
- The Renewable Heat Action Plan for Scotland;
- The Climate Change (Scotland) Act 2009;
- The Scottish Climate Change Delivery Plan;
- The Scottish Renewables Action Plan; and
- Towards a Low Carbon Economy for Scotland: Discussion Paper.

Renewable Energy and Heat Targets

4.3.2 In Scotland, policy and commitment generally reflects that of the UK Government. The Scottish Government has set a target that 50% of gross electricity consumption should come from renewable sources by 2020, with an interim milestone of 31% by 2011¹².

4.3.3 In common with the rest of the UK, a significant amount of developer activity to date has been in relation to onshore wind. However, the introduction of banding to give different levels of support through the Renewable Obligation (RO) Scotland for different renewable technologies seeks to widen the range of technologies, such as biomass, being brought forward for deployment.

4.3.4 The development of renewable energy technologies is being strongly encouraged as a means of tackling climate change and promoting the Scottish economy. An aim of the Scottish Government is to realise Scotland's very large renewable potential while safeguarding the environment. The Scottish Government has a policy of seeking to encourage a mix of renewable energy technologies, with growing contributions from offshore wind, wave, tidal and solar facilities and a greater use of biomass¹³.

4.3.5 The Scottish Government's target in relation to renewable heat is that 11% of heat demand should be generated from renewable sources by 2020. It is important to note that the 50% and 11% targets for 2020 are indicative interim ambitions, which will need to be exceeded as the Government is seeking a decarbonisation of electricity supply by 2030 and a largely decarbonised heat sector by 2050¹⁴.

4.3.6 The CHP Study that has been prepared by Forth Energy, and which is submitted in support of the Section 36 Application, has involved undertaking a heat mapping exercise, which has identified a number of potential heat customer opportunities in Falkirk. This has been referred to above at paragraph 2.4.7.

Biomass Action Plan for Scotland (2007)

4.3.7 The 'Biomass Action Plan for Scotland' was produced by the Scottish Executive in March 2007. The aim of the Action Plan is to set out a co-ordinated programme for the development of the biomass sector in Scotland *"to ensure that Scotland's biomass resource is properly supported and exploited and that it delivers additional economic benefits whilst making a contribution to the ambitious targets for emissions reduction set out in 'changing our ways' Scotland climate change programme"*.

4.3.8 The Plan, for the first time, sets out a programme for the co-ordinated development of the biomass sector in Scotland. Key aims (paragraph 2.2) of the Action Plan are:-

¹² Renewables Action Plan, page 13, The Scottish Government (2009).

¹³ National Planning Framework 2 for Scotland, paragraph 145, (2009).

¹⁴ The 'Renewables Action Plan', page 9, The Scottish Government (June 2009).

- To provide a focus for a strategic co-ordinated approach to developing biomass for energy production across the heat, electricity and transport sectors;
- To identify roles and responsibilities for Government, industry and public stakeholders to develop a vibrant bio-energy industry in Scotland; and
- To identify future actions and gaps.

4.3.9 The Plan states (paragraph 3.3) that Scotland has the potential to be the renewable powerhouse of Europe. In supporting a diverse of mixture of clean energy, the Government's focus is on those renewable technologies yet to establish a significant foothold in Scotland, including biomass, marine and hydrogen.

4.3.10 The Plan states that the Government will be focusing on expanding the renewable heat market through the development of a Renewable Heat Strategy (referred to later in this section) and the implementation of the Scottish Biomass Support Scheme.

4.3.11 Section 6.1 (page 33) of the Plan states that Scotland has enormous renewable electricity generation capacity, with biomass one of a number of potential sources alongside wind, wave, tidal and the existing hydro resource. It states that biomass can help increase that diversity with the added value that biomass generation can provide a controllable base load, enhancing security of supply. It notes the electricity generation through co-firing is currently the largest user of biomass in Scotland, although proposals for purpose built biomass plants are emerging.

4.3.12 The Plan is intended to provide a focus for the public and private sectors to maximise the opportunities for growth, employment and sustainability offered by the expansion of a biomass sector. It sets out a framework to take forward and expand the supply and use of biomass for heat, electricity and transport.

4.3.13 Given the proposed Renewable Energy Plant will deliver an output of 100 MWe, it will be of a strategic scale and will make a significant contribution to the attainment of the key aims as set out in the Biomass Action Plan for Scotland.

The Renewable Heat Action Plan for Scotland (2009)

4.3.14 The Renewable Heat Action Plan (RHAP) for Scotland was published in 2009¹⁵. It seeks to promote the growth of the sector in advance of the main market mechanism, the UK wide Renewable Heat Incentive¹⁶ (RHI) which is due to launch in April 2011. The RHAP sets out a framework for activity across a wide range of areas, which will contribute to meeting the Government's 2020 heat target.

4.3.15 The RHAP states that renewable heat will play a key role in helping to address both climate change and renewable energy ambitions. It sets out the strategic context in terms of climate change and notes that the Scottish Government's Climate Change Delivery Plan sets out strategic options for the delivery of future emissions cuts. The Delivery Plan (referred to above) notes four transformational outcomes which are needed to be substantially delivered by 2030 for Scotland to be on the correct pathway to meet the 2050 target. One of these outcomes relates to renewable heat:-

"A largely de-carbonised heat sector by 2050 with significant progress by 2030 through a combination of reduced demand and energy efficiency, together with a massive increase in the use of renewable of low carbon heating". (Page 7).

¹⁵ Renewable Heat Action Plan for Scotland: a plan for the promotion of the use of heat from renewable sources, The Scottish Government (2009).

¹⁶ The RHI is seen as the main mechanism to accelerate the rapid growth needed to reach the Scottish, UK and EU renewable energy targets.

4.3.16 The RHAP states that alongside the ambitious emissions reduction targets, Scottish Ministers have made a commitment to delivering 10 energy pledges which will be a key driver to meeting Scotland's targets of 20% of total energy use from renewable sources by 2020. To assist in reaching this target, it is proposed that 11% of heat use will be from renewable sources.

4.3.17 Energy Pledge 2 is as follows:-

"We will aim to build a commercially viable, diverse renewable heat sector in Scotland to deliver benefits to the wider public, through the implementation of our Renewable Heat Action Plan. This commitment is reflected in the Climate Change (Scotland) Act which requires the Scottish Ministers to produce and publish a plan for the promotion of the use of heat from renewable sources".

4.3.18 The RHAP refers to the UK context and notes that the Scottish Government is working with the UK Government to play its part in meeting the EU Renewable Energy Directive (adopted 2009). As stated in section 1.3, the Directive requires the UK to achieve 15% of energy use from renewable sources by 2020. Scotland, in setting a 20% target, has aimed proportionally higher than the required contribution for the UK as a whole.

4.3.19 In terms of targets, Scotland has committed to achieve a headline target of 20% of total Scottish energy use from renewable sources by 2020. This is made up of a contribution of electricity (50% of gross electricity consumption), transport (10% for renewable transport) and heat (11% of heat usage to be met from renewable sources).

4.3.20 Paragraph 4.2 of the RHAP highlights that achieving the renewable heat target will also be critical to achieving the statutory targets set in the Climate Change (Scotland) Act 2009.

4.3.21 The target for renewable heat in 2020 has been set at 6,420GWh (or 2.07GW of installed capacity), which is forecast to be in the region of 60,089GWh (60.1TWh) by 2020. The current level for renewable heat usage is approximately 1.4% (of projected 2020 demand).

4.3.22 The RHAP sets out a vision for 2020 (paragraph 5.2) which is:-

"To build a commercially viable, diverse and renewable heat industry in Scotland in support of our 2020 renewable energy target and help tackle climate change. In doing so, to maximise the contribution of sustainable biomass to meet renewable heat target and reduce carbon emissions".

4.3.23 The 11% target by 2020 will be met by various means including a substantial increase in the uptake of heat from a range of bio-energy sources across the domestic, commercial and industrial sectors.

4.3.24 The CHP study has demonstrated that there is good potential for a significant take up of local heat usage from the proposed Renewable Energy Plant which would make a material contribution to the Government's renewable heat targets.

The Climate Change (Scotland) Act (2009)

4.3.25 The Climate Change (Scotland) Act 2009 received Royal Assent on 4th August 2009¹⁷. It introduced ambitious, world leading legislation to reduce emissions. Part 1 of the Act sets the statutory framework for greenhouse gas emission reductions in Scotland by setting an interim 42% reduction target for 2020 and an 80% reduction target for 2050, from 1990 emission levels.

4.3.26 Reductions in greenhouse gas emissions from energy generation are a key component to achieve the above targets. The Act places a statutory requirement on the Scottish Ministers to set appropriate levels for energy generation to contribute to meeting the targets. Annual targets for the years 2010 – 2022 require to be set out by the Scottish Ministers no later than 1 June 2010.

¹⁷ The Climate Change Act 2008 became law in the UK on 26th November 2008. It makes it the duty of the Secretary of State to ensure that the net UK carbon account for all six Kyoto greenhouse gases for the year 2050 is at least 80% lower than the 1990 baseline.

4.3.27 As has been explained, given the proposed Renewable Energy Plant will result in annual carbon emission savings of 341 kilo tonnes¹⁸ of CO₂e and life time carbon emission savings of approximately 2.8 Mega Tonnes of CO₂e (assuming the plant life is 2015 to 2035), the development has the potential to make a very significant contribution to Scotland's efforts to reduce greenhouse gas emissions.

Scottish Climate Change Delivery Plan (2009)

4.3.28 The Scottish Government issued the Climate Change Delivery Plan¹⁹ in June 2009. The Delivery Plan sets out actions that can be delivered over the next decade and beyond, in order to achieve the targets that Parliament has laid down in the Climate Change (Scotland) Act 2009. The Plan makes it clear that the drive to reducing the impact of climate change will have a range of positive benefits for Scotland including economic opportunities in biomass and renewable heat²⁰.

4.3.29 The Plan identifies five transformational outcomes which need to be substantially delivered by 2030 to put Scotland on the correct pathway to the 2050 target, which include, *inter alia*:

- A largely decarbonised electricity generation sector by 2030, primarily using renewable sources for electricity generation with other electricity generation from fossil fuelled plants utilising carbon capture and storage;
- A largely decarbonised heat sector by 2050 with significant progress by 2030 through a combination of reduced demand and energy efficiency, together with a massive increase in the use of renewable or low carbon heating.

4.3.30 The Delivery Plan identifies key sectors of the economy for abatement and refers to the high level measures required in each sector to deliver greenhouse gas emission targets.

4.3.31 The Plan confirms that the key milestone is that by 2020 more than 50% of electricity should be generated from renewable sources and that the 2020 target equates to an electricity generation level of some 8.4 GW of installed renewables capacity. The Plan makes it clear that the requirement on the UK to meet EU renewable targets by 2020, equating to 15% of all energy use from renewable sources, will lead to strong demand from elsewhere in the UK for Scottish renewable electricity. The proposed Renewable Energy Plant will have an availability of some 85% and with a 100 MWe rated output will make a significant contribution to Scotland's 2020 target for renewable energy generation.

The Scottish Renewables Action Plan (2009)

4.3.32 The Scottish Government issued the Renewables Action Plan (RAP) in June 2009. This identifies what needs to happen in the renewables sector in order to achieve Government objectives and it focuses on actions needed over the immediate 24 month period. It is intended to be a *"live document – a portal for the development of the sector, subject to ongoing input and revision as new opportunities arise, as technology moves forward, and as new requirements become apparent"*. (RAP, Executive Summary, page 5).

4.3.33 The RAP refers to the imperative for action to address climate change (demonstrated by Scotland's world leading carbon reduction target of 42% (see the reference to the Climate Change (Scotland) Act above) is driving development across a host of policy interests. It makes reference to the Scottish Government's commitment to achieve a headline target of 20% of total Scottish energy use coming from renewable sources by 2020. Specific targets include 50% of electricity demand and the RAP sets out the framework for action in the specific area of renewable energy.

4.3.34 Key objectives are summarised as follows:-

¹⁸ This is based on a grid factor of 0.570 kgCO₂e/kWh, approximate 85% plant availability, 100MWe net output.

¹⁹ Climate Change Delivery Plan 'Meeting Scotland's Statutory Climate Change Targets', The Scottish Government, (June 2009).

²⁰ Climate Change Delivery Plan (2009), para 1.6.

- To establish Scotland as a UK and EU leader in the field of renewable energy;
 - To ensure maximum returns for the Scottish domestic economy; and
 - To meet targets for energy from renewables, and for emissions reductions, to 2020 and beyond; (RAP, Executive Summary, page 5).
- 4.3.35 The RAP refers to Scottish and UK structures and makes it clear that the Scottish Government is continuing to engage very closely with the UK Government on the shape and scope of renewable energy legislation and the financial incentives which they create. There is reference to the Renewables Obligation (RO) mechanisms and the RAP states that Scottish Government is working with “*UK colleagues on the further changes to the RO required to align it with the demands of the EU 20% target....*” (page 17).
- 4.3.36 Section 4 of the RAP highlights that each of the technology sectors will have its own part to play in helping Scotland meet its energy targets “*and ministers are committed to a diverse renewables mix to maximise the scope to match supply with demand and to enhance security of supply*” (page 20).
- 4.3.37 In terms of energy consents and planning, actions include the need to:
- Create a supportive planning landscape;
 - Ensure the planning and consenting regimes better support investment in renewables in Scotland; and
 - Continue to work with Local Planning Authorities to develop their strategic locational guidance in line with Planning Advice Note (PAN) 45 ‘Renewable Energy’ and to ensure that the planning system produces decisions that are efficient, transparent, consistent and timely (page 37).
- 4.3.38 Each renewable technology is referred to in the Annex to the RAP and with regard to bioenergy the vision is expressed as: “*To maximise the contribution of sustainable biomass to meet renewable heat and electricity targets, and reduce carbon emissions*” (RAP, page 64). The ‘headline ambitions’ of the Government with regard to bioenergy are:
- Substantial growth of bioenergy potential in Scotland in harmony with environmental and air quality obligations;
 - Substantial increase in the uptake of heat from a range of bioenergy sources across the domestic, commercial and industrial sectors.
- 4.3.39 It is noted that bioenergy is likely to be one of the main means by which Scotland’s renewable heat target is to be met (page 64).
- 4.3.40 The proposed Renewable Energy Plant would help to maximise the contribution of sustainable biomass to meet renewable heat and electricity targets, and reduce carbon emissions, entirely consistent with the vision for bioenergy in the RAP.

Towards a Low Carbon Economy for Scotland: Discussion Paper (2010)

- 4.3.41 The Scottish Government issued the report entitled ‘Towards a Low Carbon Economy for Scotland’ in March 2010. It highlights that in addition to the statutory imperative of reducing emissions, as required by the Climate Change (Scotland) Act, there are important economic and social reasons for starting the process of a transition to a low carbon economy now, with commitment and urgency. The Foreword to the Report states that “*Scotland has an opportunity to become a world leader in the low carbon economy*”. The report has been prepared to provide a Scottish focus to low carbon related activity and to complement activity at the UK level (i.e. the Low Carbon Transition Plan, July 2009 – referred to above).

- 4.3.42 The report sets out the Scottish Government's plans to move towards a low carbon economy in Scotland, as part of the overarching Government Economic Strategy²¹. The drivers of a low carbon transition are set out, including sustainable economic growth, emission reduction targets, energy supply and demand, carbon price, legislation and energy security. In terms of energy security, the report states (page 11): "*Securing the low carbon transition must include maintaining effective supply and affordability of energy at the same time as migrating to low carbon fuels, such as biomass, shifting our emphasis to renewable generation.....*"
- 4.3.43 The report refers in some detail to the economic opportunities presented by the transition to a low carbon economy. It estimates that concerted action combined with an expanding global market could increase low carbon employment in Scotland to around 130,000 by 2020. By the end of 2008, all low carbon sectors in Scotland supported some 70,000 jobs therefore there is the potential for some 60,000 new jobs. Furthermore, the report highlights that meeting Scotland's renewable electricity and heat targets will alone provide up to £15 billion worth of investment opportunities.
- 4.3.44 The economic benefits of the proposed Renewable Energy Plant have been described. The development of Renewable Energy Plant will contribute significantly to the process of Scotland's transition to a low carbon economy.

4.4 The National Planning Framework (NPF2)

- 4.4.1 The National Planning Framework 2 (NPF2) (2009) guides Scotland's development to 2030 and sets out strategic development priorities to support the Scottish Government's central purpose of 'sustainable economic growth'. The Planning etc (Scotland) Act 2006 gives the NPF2 and future NPFs a statutory footing as an expression of national planning policy. The document therefore carries considerable weight as a material consideration.
- 4.4.2 NPF2 sets Scotland in its wider context and provides strategic planning guidance to address major future planning challenges, including tackling climate change. It contains targets for energy supply and the reduction of greenhouse gas emissions (paragraph 3). NPF2 takes forward the spatial aspects of the Scottish Government's policy commitments on sustainable economic growth and climate change, which paragraph 5 of the document notes "*will see Scotland move towards a low carbon economy*".
- 4.4.3 The NPF refers to sustainable development (page 6) and notes, "*The Scottish Government's commitment to sustainable development is reflected in its policies on matters such as climate change, transport, renewable energy....*"
- 4.4.4 Climate change is specifically referred to at paragraph 16 *et seq* where NPF2 notes that substantial reductions in greenhouse gas emission will be necessary to minimise the impact of climate change. Paragraph 19 notes that the UK and Scottish Governments are taking an international lead by introducing ambitious statutory emission reduction targets through, respectively, the UK Climate Change Act and the Scottish Climate Change Bill (now the Climate Change (Scotland) Act).
- 4.4.5 Energy is specifically referred to at paragraph 25 in NPF 2. It notes that:
- "tackling climate change and reducing dependence on finite fossil fuels are two of the major global challenges of our time addressing these challenges will demand profound changes in the way we produce, distribute and use energy over the coming decades."*
- 4.4.6 Paragraph 26 notes that the EU has now set a commitment to derive 20% of its energy use from renewable sources by 2020. Reference is also made to the Scottish Governments support for this objective and Scotland's own, higher target for electricity generated from renewable sources, which is 50% by 2020.

²¹ The Scottish Government Economic Strategy (2007).

4.4.7 NPF2 also refers to a development strategy at paragraph 53 and notes that the main elements of the spatial strategy to 2030 are to *inter alia*:

“realise the potential of Scotland’s renewable energy resources and facilitate the generation of power and heat from all clean, low carbon sources”.

4.4.8 In terms of sustainable growth, paragraph 65 notes that energy is a major resource for rural areas and it states that *“the Government is committed to realising the power generating potential of renewable sources of energy”.*

4.4.9 It should also be noted that paragraph 145 in NPF2 indicates that the Government is committed to establishing Scotland as a leading location for the development of renewable energy technology and an energy exporter over the long term. It states *“The Government is committed to establishing Scotland as a leading location for the development of renewable energy technology and an energy exporter over the long term. It is encouraging a mix of renewable energy technologies, with growing contributions from offshore wind, wave, and tidal energy, along with greater use of biomass. The aim of national planning policy is to develop Scotland’s renewable energy potential whilst safeguarding the environment and communities.”.*

4.4.10 In terms of renewable heat, paragraph 163 of NPF2 indicates the Government’s support and encouragement to maximise the potential from local heat networks. The paragraph also makes reference to the role of Planning Authorities in facilitating decentralised patterns of energy generation and supply, and that heat networks should be considered in relation to major proposals.

4.4.11 Overall, therefore, the NPF2 sets out the Government’s commitment to the further development of renewable energy in Scotland and confirms importance of this resource as a key element of both achieving the spatial strategy for the country up to 2030 and attaining the Government’s central purpose of increasing sustainable economic growth.

4.4.12 The proposed Renewable Energy Plant is considered to be entirely consistent with the relevant terms of the NPF.

4.5 Scottish Planning Policy (2010)

4.5.1 On the 4 February 2010, the Scottish Ministers issued “Scottish Planning Policy” (SPP), following consultation on the proposed thematic policies during April 2009 and the publication of parts one and two of the SPP in October 2008.

Key Policy Provisions of SPP

4.5.2 The SPP states at paragraph 1 that the Scottish Government’s expressions of national planning policy are now provided within the NPF, Designing Places, Designing Streets, Circulars and the SPP. The SPP sets out:

- The Scottish Government’s view of the purpose of planning;
- The ‘core principles’ for the operation of the system and the objectives for the key parts of the system;
- Statutory guidance on sustainable development and planning under Section 3E of the Planning etc. (Scotland) Act 2006;
- Concise subject planning policies, including the implications for development planning and development management; and
- The Scottish Government’s expectations of the intended outcomes of the planning system.

4.5.3 It is clear from the SPP that the Government is committed to an efficient planning system to support the core objective of sustained economic growth.

4.5.4 The SPP notes that increasing sustainable economic growth and sustainable development is an overarching principle of the Scottish Government and that *the “planning system should promote development that supports the move towards a more economically, socially and environmentally sustainable society”*. The planning system has an important role in supporting the Government’s commitment towards Sustainable Development through its positive influence upon the location and design of new development. Paragraph 37 states that the decision-making process within the planning system should:

“contribute to the reduction of greenhouse gas emissions in line with the commitment to reduce emissions by 42% by 2020 and 80% by 2050, contribute to reducing energy consumption and to the development of renewable energy generation opportunities.”

4.5.5 In addition, it is also recommended that decision-making should protect and enhance cultural heritage, the natural environment (including biodiversity and the landscape) and take into account implications for water, air and soil quality. These matters are addressed in the more detailed Subject Policies within the SPP.

4.5.6 Climate Change, and the need to reduce greenhouse gas emissions, is prominent within the SPP and reaffirms the position of Section 44 of the Climate Change (Scotland) Act 2009 which places a statutory duty on all public bodies to act:

- In the way best calculated to contribute to the delivery of the emissions targets in the Act;
- In the best way calculated to help deliver the Government’s climate change adaptation programme; and
- In a way that it considers is most sustainable.

4.5.7 The 2020 and 2050 greenhouse gas reduction targets are noted and it is stated at paragraph 42 of the SPP that *“the causes of climate change and the need to adapt to its short and long terms impacts should be taken into account in all decisions throughout the planning system”*

4.5.8 In addition to the policy advice summarised above, the SPP provides more detailed planning policy advice with regard to specific subject areas, which has replaced the series of SPPs and NPPGs as referred to above. Specific policy advice is provided within the SPP under the following relevant headings:

- renewable energy,
- economic development,
- historic environment,
- landscape and natural heritage,
- coastal planning,
- transport, and
- flooding.

Renewable Energy

4.5.9 The SPP makes clear the Scottish Government’s commitment to increase the amount of electricity generated from renewable sources to meet statutory obligations and states that *“the commitment to increase the amount of electricity generated from renewable sources is a vital part of the response to climate change”* (paragraph 182).

- 4.5.10 Scotland's 2020 target for 50% of electricity to be generated from renewable sources is referred to and it is noted that this target is not a cap. The SPP states that Planning Authorities should *"support the development of a diverse range of renewable energy technologies, guide development to appropriate locations..."* (paragraph 184).
- 4.5.11 The SPP advises that either Development Plans or Supplementary Guidance clearly explain the factors that will be taken into account when considering renewable energy development proposals and that condition of planning permission should include decommissioning and restoration requirements.
- 4.5.12 Paragraph 193 of the SPP provides specific advice with regard to large scale biomass plants and notes that their location will be dependant on a number of factors including the economic costs of transporting fuel, the availability of feedstock through the year and the scale of the plant. The SPP advises that Development Plans should identify sites with the potential to accommodate biomass plants as well as explaining the factors that will be considered in decision making.
- 4.5.13 The proposed Renewable Energy Plant is considered to be entirely consistent with the relevant terms of the renewable energy policies of SPP.

Economic Development

- 4.5.14 The SPP sets out the Scottish Government's Policy on economic development between paragraphs 45 and 51. It notes that planning authorities should *"respond to the diverse needs and occasional requirements of different sectors and sizes of businesses and take a flexible approach to ensure that changing circumstances can be accommodated and new economic opportunities realised"* (paragraph 45)
- 4.5.15 The SPP provides 5 criteria by which the planning systems should support economic development, which are:-
- Taking account of the economic benefits of proposed development in development plans and development management decisions.
 - Promoting development in sustainable locations, particularly in terms of accessibility;
 - Promoting regeneration and the full and appropriate use of land, buildings and infrastructure;
 - Supporting development which will provide new employment opportunities and enhance the local competitiveness, and
 - Promoting the integration of employment generation opportunities with supporting infrastructure and housing development.
- 4.5.16 The proposed Renewable Energy Plant is considered to be entirely consistent with the relevant terms of the economic policies of SPP.

Historic Environment

- 4.5.17 The SPP sets out the Scottish Government's policy on the protection, conservation and enhancement of the historic environment and the role of the planning system.
- 4.5.18 The SPP states that the historic environment includes ancient monuments, archaeological sites and landscapes, historic buildings, townscapes, parks, gardens and designed landscapes and other features. Non-designated sites, as well as designated sites, are considered by the SPP as an important element of Scotland's heritage which contribute to national identity.
- 4.5.19 Paragraph 111 notes that *"In most cases, the historic environment (excluding archaeology) can accommodate change which is informed and sensitively managed, and can be adapted to accommodate new uses whilst retaining its special character"*.

4.5.20 The SPP makes reference to the need to take into account Historic Scotland policy in the determination of applications affecting the historic environment; which include Scottish Historic Environment Policy (SHEP) and the 'Managing Change in the Historic Environment' guidance note series.

4.5.21 The ES has demonstrated that there would be no significant effects on cultural heritage resources. The proposed Renewable Energy Plant is considered to be entirely consistent with the relevant terms of the historic environment policies of SPP.

Landscape and Natural Heritage

4.5.22 The SPP provides policy guidance for the conservation, enhancement and sustainable use of Scotland's landscape and natural heritage at paragraph 125 et seq. Natural heritage is identified as including flora, fauna, geological and physiographical features, its natural beauty and amenity (Natural Heritage (Scotland) Act 1991).

4.5.23 Planning Authorities are directed to take a broader approach to landscape and natural heritage than just conserving designated sites and species. The SPP also states that the *"Landscape in both the countryside and urban areas is constantly changing and the aim is to facilitate positive change whilst maintaining and enhancing distinctive character."* It is also stated that *"Different landscapes will have a different capacity to accommodate new development, and the siting and design of development should be informed by the local landscape character"*. (paragraph 127).

4.5.24 Paragraph 131 of the SPP states that *"While the protection of the landscape and natural heritage may sometimes impose constraints on development, with careful planning and design the potential for conflict can be minimised and the potential for enhancement maximised"*.

4.5.25 On designated sites, the SPP provides guidance that *"Statutory natural heritage designations are important considerations where they are directly or indirectly affected by a development proposal. However, designation does not necessarily imply a prohibition on development"* (paragraph 131).

4.5.26 The SPP states that Planning Authorities should only apply the precautionary principle where the impacts of a proposed development are uncertain and where there is "sound evidence" that irreversible damage could occur. In line with this, paragraph 132 is clear in that *"The precautionary principle should not be used to impede development unnecessarily. Where development is constrained on the grounds of uncertainty, the potential for research, surveys or assessments to remove or reduce uncertainty should be considered"*.

4.5.27 The SPP provides detailed guidance on natural heritage resources and classifies those under 5 key headings, namely:

- International Designations;
- National Designations;
- Local designations;
- Protected Species;
- Trees and Woodland.

4.5.28 Sites with international designations, such as Natura 2000 sites, must be subject to appropriate assessment by Planning Authorities on its conservation objectives where developments are likely to result in significant adverse effects on the designation. Development which could have a significant effect on a Natura site will only be permitted where:

- An appropriate assessment has demonstrated that it will not adversely affect the integrity of the site; or
- There is no alternative solutions; and

- There are imperative reasons of overriding public interest, including those of a social or economic nature.

4.5.29 Nationally designated sites, such as National Scenic Areas (NSA), Site of Special Scientific Interest (SSSI), National Parks and National Nature Reserves (NNR) are noted as important material planning considerations in the assessment of applications, and development proposals should only be permitted where:

- *It will not adversely affect the integrity of the area or the qualities for which it has been designated; or*
- *Any such adverse effects are clearly outweighed by social, environmental or economic benefits of national importance.*

4.5.30 The ES has demonstrated that there would be no significant adverse effects on landscape and natural heritage designations. The proposed Renewable Energy Plant is considered to be entirely consistent with the relevant terms of the landscape and natural heritage designations policies of SPP.

Coastal Planning

4.5.31 The SPP provides the Scottish Government's planning policy on coastal planning between paragraphs 98 and 103. It notes that sustainable development of coastal areas is an important contributor to sustainable economic growth and that a large proportion of Scotland's population live near the coast as it is a major focus for economic activity, recreation and tourism.

4.5.32 The SPP notes that statutory planning controls extend to the mean low water mark of ordinary spring tides and that a new marine planning system is currently being introduced through the Marine (Scotland) Bill²². The powers of marine planning will extend up to the mean high water mark where the powers of the planning system end.

4.5.33 The SPP notes that Development Plans should identify areas of the coast which are suitable for development and those areas which are unsuitable such as the isolated coast. It notes that coastal areas likely to be suitable for development include those within existing settlements and within substantial freestanding industrial and energy developments, especially where such development is linked to regeneration or the reuse of brownfield land. It is also noted that coastal areas can contain internationally and nationally designated nature conservation sites and other important environmental resources which require to be protected from inappropriate development.

4.5.34 The proposed Renewable Energy Plant is considered to be entirely consistent with the relevant terms of the coastal policies of SPP.

Transport

4.5.35 Reducing emissions from transportation sources is identified as providing a contribution to the Scottish Government's greenhouse gas reduction targets. Tackling emission levels and congestion will support economic growth and Planning Authorities require to give consideration to the relationship between transport and land use in order to achieve sustainable patterns of development.

4.5.36 The proposed Grangemouth Renewable Energy Plant is to be located within the Port of Grangemouth. The application site is capable of accommodating suitably sized ships from national or international sources required to deliver large quantities of biomass fuel. The majority of the fuel delivered to site will be transported by ship, which is the most carbon efficient form of bulk cargo transportation: this is explained in the Sustainability Statement submitted in support of this Application (and which is further referred to below).

²² The Marine (Scotland) Bill received Royal assent on 10th March 2010 and is now an Act of Parliament.

Flooding and Drainage

- 4.5.37 The SPP provides the national policy on flooding and drainage matters between paragraphs 196 and 211. The SPP notes that planning authorities are required to take the risk of flooding into account when preparing development plans and determining applications for planning permission. It notes that development which would have a significant probability of being affected by flooding or a development which would increase the probability of flooding elsewhere should not be permitted. In this respect it is advised that impermeable surface areas are kept to a minimum within new developments.
- 4.5.38 The SPP identifies that Section 42 of the Flood Risk Management (Scotland) Act 2009, once implemented, will amend the Town and Country Planning (Development Management Procedure) (Scotland) Regulations 2009 with regard to flooding matters and the requirement for flood risk assessments to be provided where a development is likely to result in a material increase in the number of buildings at risk from flooding.
- 4.5.39 The SPP (at paragraph 204) provides a risk framework as a basis for making planning decisions that have flood risk implications. The proposed Renewable Energy Plant is consistent with the advice contained within this framework.
- 4.5.40 The ES has demonstrated that there would be no significant adverse effects in terms of flooding. The proposed Renewable Energy Plant is considered to be entirely consistent with the relevant terms of the flooding and drainage policies of SPP.

4.6 The National Renewables Infrastructure Plan

- 4.6.1 At the request of The Scottish Ministers, in partnership between Scottish Enterprise and Highlands and Islands Enterprise, a National Renewables Infrastructure Plan (NRIP) has been developed for Scotland (2010). The NRIP sets out an approach to encourage early public and private investment in the required infrastructure at 'first phase' port locations, as well as distinguishing between the infrastructure requirements for the offshore wind, wave and tidal industries. The identified infrastructure development is considered as being necessary to establish Scotland as a competitive location to serve the offshore renewables market.
- 4.6.2 The NRIP identifies the port of Grangemouth as being a 'medium term potential location' site for the development of 'distributed manufacturing' required to support the offshore renewables industry. The NRIP identifies Grangemouth in this regard primarily due to its port infrastructure. While Grangemouth's potential role in the offshore renewables industry has been identified within the NRIP, it should be noted that other renewables developments such as the proposed Renewable Energy Plant can be viewed as being complementary with the envisaged role of Grangemouth within the NRIP. The proposed Renewable Energy Plant can be viewed as having the potential to act as a catalyst for other renewables development within the port of Grangemouth. It is also important to note that the NRIP does not recommend that the entirety of the developable land within the port area of Grangemouth be safeguarded to support the offshore renewables industry.

4.7 Combined Heat and Power Potential

- 4.7.1 Forth Energy has prepared a Combined Heat and Power (CHP) Feasibility Study in support of the Section 36 Application. This details the potential for the Renewable Energy Plant to provide various grades of heat for industrial, commercial and for district heating uses near to the application site.
- 4.7.2 Premium grade heat (bled steam from turbine extraction) and medium grade heat (from the flue gas extraction) have potential to supply useful renewable heat for the duration of the Renewable Energy Plant's operational lifetime.

4.7.3 The use of 'waste' (low temperature) heat has been discounted at this stage as a viable option for potential customers, however, further investigations into future heat opportunities are being undertaken to identify potential users that might be attracted to the area to utilise this grade of heat.

4.7.4 As explained in paragraph 2.4.7, the CHP study refers to the Heat Mapping exercise undertaken which has identified a number of potential heat customer opportunities. Initial discussions have been held with process industry heat customers and a total potential of 200 MW of process heat supply has been identified between the Refinery and a number of other process heat users, including the Ineos Refinery whose production facilities are located immediately adjacent to the Port. In addition, discussions with Falkirk Council have identified potential for the development of a District Heating network to service Grangemouth town centre, with a capacity of up to 19 MW. The Heat Mapping Exercise indicates the potential to deliver heat to up to 33 discrete customer locations.

4.7.5 As with all project opportunities of this nature, it will only be possible to undertake detailed feasibility studies and for commercial discussions around contractual terms and conditions to take place, once Section 36 consent has been granted for the proposed development.

4.8 Sustainability Statement

4.8.1 Forth Energy's view is that the development of biomass energy must go hand in hand with consideration of environmental protection and resource equality issues if the end product is to be considered sustainable. The sustainability concerns that have been raised over the last decade with relation to biomass include the protection of ecosystems, biodiversity and carbon stocks, and of global ecological equity, among others.

4.8.2 Forth Energy intends to take account of the range of sustainability concerns related to the Grangemouth Renewable Energy Plant. This application is accompanied by a Sustainability Statement which demonstrates that sustainability issues have been addressed comprehensively, in relation to the development. Key findings of the study and commitments that arise include:

- All forest-derived biomass material will be sourced from sustainably managed forests both in terms of forestry operations and in terms of land use and land procurement. All forest-derived fuels used will be certified by internationally accepted sustainability certification systems. Where possible FSC certified fuels will be given preference over other comparable schemes.
- It is Forth Energy's objective to procure as much fuel as practicable, both economically and environmentally, from indigenous suppliers however it is recognised that, with the limited availability of UK sourced biomass, the majority of the fuel will, at least initially, be procured from overseas.
- The majority of the fuel delivered to site will be transported by ship, which is the most carbon efficient form of bulk cargo transportation. A maximum of 15% of the fuel (by calorific value) will be delivered by road. It is estimated that CO₂ emissions from transport will amount to 0.056MTe/a, with shipping producing around 54% of this total.
- A sustainability framework based on Scotland's Sustainable Development Strategy has been developed to understand the overall sustainability impacts of the plant. Using the outcomes of this assessment, a range of sustainability benefits arising from the Grangemouth Renewable Energy Plant have been identified and recommendations made for any neutral or negative impacts. These recommendations will be used to develop a sustainability policy for Forth Energy. Forth Energy intends to develop and implement its own biomass sustainability policy taking into account all national and EU regulatory drivers and guidelines.
- This biomass sustainability policy will be developed with input from, and engagement with, relevant stakeholders including the Scottish Government, Local Authorities and third sector organisations and will:
 - Address minimum Greenhouse gas savings on a lifecycle basis including direct and indirect land use impacts;

- Address wider environmental and social impacts, e.g. biodiversity, impact on food prices and impacts on soil and water quality;
- Be independently audited and verified.

4.8.3 Sustainability matters have therefore been taken into account in considerable detail and this is a material consideration in favour of the proposed development.

4.9 Planning Advice Notes

4.9.1 Table 4.1 below identifies and summaries PANs of particular relevance to the proposed development.

Table 4.1 : Summary of Relevant Planning Advice Notes

| PAN | Title | Summary |
|--------|---|--|
| PAN 42 | Archaeology the Planning Process and Scheduled Ancient Monument Procedures (1994) | Provides best practice advice on addressing archaeological issues within the planning process, and on best practice separate controls over scheduled monuments. Also provides detailed advice on excavation, maintaining records, scheduling and legislation. |
| PAN 45 | Renewable Energy Technologies (2002); and | Supports the policies of SPP by providing information and advice on the technologies for harnessing renewable energy for electricity generation. |
| PAN 56 | Planning and Noise (1996) | Demonstrates the role of the planning system in preventing and limiting the adverse effects of noise without prejudicing investment in enterprise, development and transport. |
| PAN 58 | Environmental Impact Assessment (1999) | Relates specifically to environmental impact assessment for development projects authorised under planning legislation. It provides information and advice on: the legislative background to EIA, EIAs in Scotland, the process of EIA, environmental studies and statements, the evaluation of environmental information by Planning Authorities. |
| PAN 60 | Planning for Natural Heritage (2000) | Gives basic advice in relation to development and natural heritage. It reiterates the Government's commitment to the protection and enhancement of the natural heritage. |
| PAN 68 | Design Statements | Provides advice on the matters to be examined and considered in evolving the design of a proposed development and illustrating this design evolution within a Design Statement. |
| PAN 69 | Planning & Building Standards Advice on Flooding (2004) | Supports national planning policy on flooding. Contains advice on addressing flood risk in development plans and in dealing with planning applications. |
| PAN 75 | Planning for Transport (2005) | Provides advice on the requirement to link transport strategies and development plans and the need to take into account accessibility, location, modal split parking and design. |
| PAN 81 | Community Engagement – Planning with People (2007) | Provides advice to Planning Authorities and developers on how communities should be properly engaged in the planning process. |

4.9.2 The design of the proposed Renewable Energy Plant and the approach to undertaking the EIA, has taken account of the advice contained within the above PANs. For further detail, individual ES Chapters should be referred to.

4.10 Falkirk Council's Action Plan for the Economic Downturn

4.10.1 In light of the difficult national economic conditions, Falkirk Council produced an 'Action Plan for the Economic Downturn' in January 2009. This followed from a Committee Meeting which took place on 10th December 2008 at which Falkirk Council representatives discussed the anticipated impacts of the economic downturn, the area's economic strengths and the key actions to be undertaken by the Council to respond to the economic downturn. The Falkirk Council Development Management team applies this document as a material consideration in decision making processes.

4.10.2 The Council's Committee Report of January 2009 (paragraph 2.1) states that:

"The Falkirk area is now experiencing the effects of the economic downturn:

- *Unemployment, which early in 2008 fell to below the Scottish average, its lowest level for 25 years, has increased in the past year and is now 2.7%, with 2,576 people unemployed.*
- *Investment in regeneration projects has slowed. The timescales for delivery of key projects in Bo'ness and Falkirk Gateway have had to be extended due to reduced demand and capacity for investment.*
- *Several local companies have announced redundancies or plan to reduce staff levels. Many local companies experience difficulties in accessing funds to maintain cash flow or progress new investment. Additional problems result from increased energy costs or supply chains fragmenting.*
- *Other evidence of economic stress has been witnessed in reduced trading activity in town centres and increased claims for hardship relief. A substantial drop in house purchases has been witnessed and enquiries for business properties have reduced.*
- *It is anticipated that 2009 will show increases in unemployment, further decline in business confidence and activity and lower levels of investment."*

4.10.3 Based on these effects, Falkirk Council has created a response to the economic downturn and has identified the need to *"Exploit opportunities for investment and, despite the financial pressures, maintain expenditure locally, particularly in the hard-pressed construction sector, to upgrade local infrastructure and maintain the momentum of regeneration projects."* (paragraph 2.2) in addition to other measures.

4.10.4 The 'Action Plan for the Economic Downturn' (action 'e') aims to:

"Pursue the case for accelerated capital investment and progress the necessary planning and design work for investment under the recently announced Scottish Government capital programme fund to upgrade infrastructure links at:

- *the Grangemouth Port/Freight Hub and Petrochemical complex;*
- *Motorway junctions (M9, M876)."*

4.10.5 The 'Action Plan for the Economic Downturn' (action 'h') aims to maintain investment levels in regeneration by adopting a flexible approach, extending timescales for delivery and by reviewing infrastructure commitments.

4.10.6 Furthermore, action 'i' aims to extend the flexibility of the Council's approach to planning by reviewing their approach to Section 75 agreements and material considerations in planning applications to attract investment and jobs.

4.11 The Emerging Development Plan

4.11.1 The Planning etc (Scotland) Act 2006 introduced, among other things, a revised Development Planning system. For the City Regions only, Structure Plans are to be replaced with Strategic Development Plans (SDP). There is no SDP to be prepared for the Falkirk Council area. All Local Plans are to be replaced with Local Development Plans (LDP) and Falkirk Council has indicated that the Main Issues Report (MIR) for the LDP will be published for consultation early 2011. The MIR is the first formal stage of plan preparation.

4.12 Conclusions

Renewable Energy Policy

- 4.12.1 This assessment of the proposed development in relation to the relevant material considerations concludes that the proposed development is in accordance with the objectives of renewable energy policy at the EU, UK and Scottish Government levels.
- 4.12.2 There is a strong policy drive at a European, UK and Scottish level to continue to develop renewable energy. International and national commitments have been made to address the effects of climate change and to achieve greater security in the domestic supply of energy.
- 4.12.3 In conclusion, these latest European and UK Government policies establish a strategic need for renewable energy provision in the UK to assist in tackling climate change. Furthermore, the UK needs to address the potential future electricity generation gap in the UK, where electricity demand could outstrip supply due to the closure of older capacity on the system, as well as ensuring that the country maintains its security and diversity of energy supply. The Renewable Energy Plant is considered to be a valuable addition to the UK's energy generation portfolio and will assist in securing the UK's energy supply system.
- 4.12.4 The proposed Grangemouth Renewable Energy Plant would have significant advantages compared to other renewable technologies such as wind power, hydroelectric, solar and photovoltaics, which, whilst being valuable sources of renewable energy, are intermittent in nature. The degree of intermittency is commonly referred to as the 'load factor'²³. The Grangemouth Renewable Energy Plant's design load factor is approximately 85% which will assist the National Grid in balancing short term electricity supply with demand and maintaining the integrity of the national electricity transmission system.
- 4.12.5 The proposed development will make a direct contribution to achieving renewable energy generation and renewable heat deployment targets thereby implementing Government policy at the UK and Scottish levels which encourages more electricity generation and heat usage from renewable sources.
- 4.12.6 In terms of electricity generation, the total renewable electrical output for the site will be up to 100 MWe. The Renewable Energy Plant has a strategic fit with the energy requirements of the Falkirk Council area. It will be capable of supplying approximately 92% of the overall (industrial, commercial and domestic) electricity requirements of the area. Furthermore, the Renewable Energy plant will also be capable of exporting renewable heat to nearby users.
- 4.12.7 In terms of annual carbon emission savings, the savings for the Renewable Energy Plant in 2015 would be 0.16 Mega tonnes²⁴ of CO₂e.
- 4.12.8 In terms of life time carbon emission savings, taking into account the reduction in carbon in the UK grid, the savings of the Grangemouth plant are estimated to be approximately 3.2 Mega Tonnes of CO₂e (assuming the plant life is 2015 to 2035).
- 4.12.9 The electricity and heat produced by the Grangemouth Renewable Energy Plant would therefore contribute positively to the policy objectives outlined above, over its lifetime by producing renewable energy and heat and thereby reducing greenhouse gas emissions from UK power generation. Furthermore, the Sustainability Statement has demonstrated that development and operation of the proposed Renewable Energy Plant will take account of key sustainability principles directly relevant to biomass.

²³ The Load Factor is calculated by dividing the amount of electricity that a plant produces over a year by the amount of electricity it could have produced if it had run at full power over that same period.

²⁴ This is based on a grid factor of 0.570 kgCO₂e/kWh, approximate 85% plant availability, 100MWe net output.

National Planning Policy and Advice

- 4.12.10 In conclusion, Government national planning policy and guidance represent important material considerations in support of renewable energy developments where they can be developed in an environmentally acceptable way.
- 4.12.11 The proposal for the Renewable Energy Plant can draw significant support from national planning policy objectives, targets and subject policy on renewable energy and renewable heat generation.
- 4.12.12 The proposed development has been assessed in the context of relevant material considerations and it is considered that the location and the landscape and townscape context has the capacity to accommodate the proposed development. Overall, it is considered that the proposed Renewable Energy Plant is environmentally acceptable and the development satisfies the key principles of SPP in this regard.

Other Material Considerations

- 4.12.13 The CHP Study demonstrates the opportunities for deploying renewable heat to local users. The Sustainability Statement has outlined the sustainable principles which underpin the proposed Renewable Energy Plant. These findings deserve significant weight to be attached to them.
- 4.12.14 The development of the proposed Renewable Energy Plant would be entirely consistent with the objectives of the National Renewable Infrastructure Plan.
- 4.12.15 The proposed Renewable Energy Plant is consistent with the relevant aims and objectives of the Falkirk Council 'Action Plan for the Economic Downturn' and draws significant support from it.
- 4.12.16 Overall, it is considered that the material considerations referred to deserve significant weight and they support the proposed development.

5 Conclusions

5.1 Introduction

- 5.1.1 Relevant Development Plan policies have been considered in the evaluation of the proposed development, alongside other material considerations. The aims and objectives and key policies in the Development Plan are an important part of the framework against which the proposed development falls to be considered.
- 5.1.2 The underlying *aims and objectives* of the Development Plan and individual policies have been considered, and the conclusion is reached at both a strategic and local level that these aims and objectives would not be undermined to the extent of causing harm to the regional or local land use planning strategy, (as set out in either the approved Structure or the Finalised Draft Local Plan).

5.2 The Electricity Act 1989

- 5.2.1 As identified in Chapter 1, the proposed development requires to be considered under the terms of the 1989 Act. Paragraph 3(2) of Schedule 9 to the 1989 Act, provides a specific statutory requirement on the Scottish Ministers to have regard to the following when considering development proposals:
- 5.2.2 *“The desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest; and.....The extent to which the developer has complied with its duty to do what it reasonably can to mitigate any effect which the proposals would have on the natural beauty of the countryside or any such flora, fauna, features, sites, buildings or objects”.*
- 5.2.3 The information that is contained within the individual topic chapters of the ES addresses these matters.
- 5.2.4 It is important to note the Act's use of the terms 'desirability' and 'reasonably' with regard to project design, siting and mitigation. This recognises that there are balances and reconciliations to be considered in decision making.
- 5.2.5 Through the EIA process that has been undertaken in accordance with good practice, potential environmental effects have been avoided, reduced or appropriate mitigation proposed. It is considered that the detailed work undertaken for the EIA has confirmed that the proposed development is environmentally acceptable. It is further considered that the Applicant has fulfilled the obligations under Schedule 9 of the Electricity Act in this regard.

5.3 Development Plan Conclusions

- 5.3.1 Following detailed consideration of the relevant policies, it is considered that the proposed development would be in accordance with the Development Plan when read as a whole.
- 5.3.2 The aims and objectives of the Development Plan have been considered and the conclusion reached is that the proposed development is supported by them. It is concluded that the significant visual effects that would result are limited in number and are considered acceptable, within the wider policy context.
- 5.3.3 The Development Plan has sustainability at its core and the proposed development furthers that aim. The Development Plan promotes renewable energy projects, subject to assessment against various other policies within the Plan. From the assessment of planning policy considerations undertaken, the proposed development can draw significant support from the Development Plan.

- 5.3.4 Considering the proposed development in terms of the relevant policies and provisions of the Development Plan as a whole, it is concluded that the proposed development is in accordance with the statutory Development Plan.

5.4 Material Considerations

- 5.4.1 Material considerations, by definition, can be far reaching and involve a variety of considerations. An assessment of material considerations relevant to the application was undertaken, and these were examined in detail. Of particular relevance are the EU, UK and Scottish Government renewable energy targets and policies with regard to climate change. Such targets and policies, provide the basis of the need case for the proposed development.
- 5.4.2 The proposed development would aid the realisation of renewable energy generation and heat deployment targets, and would make a significant contribution to the respective Scottish and UK 2020 targets.
- 5.4.3 It is clear that Government policy on renewable energy is part of a well-established pattern – the commitment to a low carbon future .has spanned successive Governments. It forms part of a broad international picture of ever more ambitious policy targets designed to tackle climate change through the promotion of renewal energy, among other means. Long term strategies have been put in place to further those aims and, so far as the Scotland and the UK is concerned, generating power using biomass is an important component.
- 5.4.4 It is also clear from the background of renewable energy policy set out in chapter 4, that at the highest level of policy making, the UK has taken an unambiguously positive approach to the setting of ambitious renewable energy targets and stringent carbon budgets. As matters stand there has been a steady and continuing momentum that has built up over the last few years in support of measures designed to combat climate change. If anything, that momentum is increasing and it is a weighty material consideration in favour of the proposed Renewable Energy Plant.
- 5.4.5 The proposed development would also result in a significant benefit in terms of CO₂ emission savings. Emissions targets are also recognised within the NPF2, which is (as of June 2009) a national planning policy statement that has statutory recognition.
- 5.4.6 National planning policy has also been considered. Subject policies ‘Economic Development’ and ‘Renewable Energy’ of SPP are particularly supportive of the proposed development with regard to renewable energy generation, climate change action, employment creation and economic benefits.
- 5.4.7 National planning policies regarding the built environment and natural and cultural heritage have also been considered and the proposed development is considered to be supported by these policies in the context of it having been designed and sited to avoid areas of greatest sensitivity and to minimise environmental effects.
- 5.4.8 In conclusion, the material considerations set out are found to be particularly supportive of the proposed development.

5.5 Overall Conclusions

- 5.5.1 A detailed assessment of the relevant provisions of the Structure and Local Plan has been presented within the preceding Chapters of this assessment. In considering the underlying aims and objectives of the Plan and those of individual policies, together with the specific terms of the relevant policies, it is concluded that the project is in accordance with the Development Plan when it is read as a whole.
- 5.5.2 The proposed development when tested against Schedule 9, the Development Plan and material considerations demonstrates that there will be very limited impacts and that the site is suitable for the proposed development.

- 5.5.3 The overall conclusion reached is that it would be appropriate to grant consent and associated deemed planning permission for the construction and operation of the proposed Grangemouth Renewable Energy Plant, subject to appropriate conditions.



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