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3 Alternatives Considered

3.1 Introduction

This chapter of the EIAR describes the alternatives to the project that have been considered taking into account its key objectives and how these would be met by alternative options. As stated in **Chapter 1** of this EIAR the proposed development has the following key objectives:

- Objective 1.** To support ESB's transition to low carbon clean energy production thereby directly supporting the de-carbonisation of the energy generation sector as a whole in-line with National and EU policy.
- Objective 2.** To continue to contribute strategically to the socio-economic wellbeing of the Irish State and the Eastern and Midland Region in which West Offaly Power is situated, in line with National and EU policy.
- Objective 3.** To continue to contribute towards security of clean electricity supply into the future through diversification of fuel source and utilisation of indigenous fuel supply in line with National and EU policy.

Alternatives considered relate principally to the operation of the power generation plant and ADF. The alternatives considered are:

- Do nothing
- Continued peat fuelled energy generation
- Immediate switching to biomass only
- Transition to biomass in 2030
- Firing on natural gas
- Solar photovoltaic energy generation
- Energy storage
- Alternative landfill options:
 - Seek an alternative licenced disposal site
 - Develop an alternative licenced disposal site
- Alternative fuel transport options
- Alternative design

The proposed project as described in **Chapter 4** of this EIAR will see the existing WOP station continue in operation post 2020 (the planning expiration date) with a staged transition from peat to biomass fuel which will be occur by the end of 2027. Peat harvesting for the supply of peat fuel to WOP will also cease. Typically, Bord na Móna harvest and stockpile peat for up to two years in advance of delivery to WOP. WOP related peat harvesting could therefore cease at any time in the two year period prior to the end of peat fuel use by the station.

The impacts associated with these alternatives as compared to the proposed development are as described in **Table 3-2** below.

3.2 Alternative 1 – ‘Do Nothing’

The ‘Do Nothing’ option would mean that the WOP station would close at the end of 2020 and would subsequently be decommissioned and demolished in accordance with its IE Licence requirements and the requirements set out in its grant of planning permission.

If the WOP station were decommissioned then none of the project objectives as detailed above would be achieved. In such a scenario, the station would no longer be available to generate electricity and to make a contribution to the grid which amounted to c.1.109 Million MWhrs of electricity in 2017 (see AER 2017) for example. In this scenario 1.13 million tonnes of carbon would not be produced (figure extracted from AER 2017).

However, in this scenario, there would be no change in the electricity system demand. Therefore, the shortfall in capacity would have to be provided from another source - most likely another dispatchable source albeit one using a carbon based fossil fuel such as gas or coal. Indeed, this would certainly be the case during periods of low or no renewable energy availability as in the dry spell in June/July 2018 where wind energy generation was very low.

In addition to carbon, all other emissions to air, soil and water from WOP station would cease. Emissions are controlled, monitored and reported under the generating station’s IE Licence (Reference P0611-02) issued by the EPA. Total emissions are reported annually in the generating stations Annual Environmental Report (AER). In 2017 the following emissions to air were reported for WOP:

Table 3-1: Emissions per pollutant

| | Emissions (Tonnes/annum) |
|--|--------------------------|
| Parameters | 2017 |
| Carbon dioxide (CO ₂) | 1,130,975 |
| Sulphur oxides (SO _x /SO ₂) | 222,5 |
| Particulate matter (PM ₁₀) | 4.1 |
| Carbon monoxide (CO) | 83.4 |
| Nitrous oxide (N ₂ O) | 69.2 |
| Ammonia (NH ₃) | 15.1 |
| Non-methane volatile organic compounds (NMVOC) | 3.9 |
| Benzene | 0.2 |

| Emissions (Tonnes/annum) | |
|---|--------|
| Polycyclic aromatic hydrocarbons (PAHs) | 0.0009 |
| Nitrogen oxides (NOx/NO2) | 650 |

In the 'Do Nothing' scenario, emissions to air in the order of those produced in 2017 would cease from WOP station. The stations output would most likely be replaced by other non-renewable sources, hence there would be increased emissions at these alternative generation sites, some of which could be lower carbon generation such as coal or high efficiency gas plant, other output will be replaced by open cycle gas plant at lower efficiency hence higher carbon output.

No ash would be generated or disposed of to the ADF. Noise associated with the operation of the station and ADF would cease and no discharges to water would occur.

In the 'Do Nothing' scenario, the closure of the station would prevent the station from transitioning to full renewable biomass. Where the station does not transition to biomass, it would not result in the displacement of other fossil fuel electricity generation on the system.

Peat fuel would no longer be harvested to supply the station and GHG emissions associated with peat harvesting would ultimately cease.

The "Do Nothing" Scenario would see the immediate closure of the station with a significant socio economic impact on the midlands and eastern region through job losses at WOP and the indirect peat harvesting and supply operations. There would be no just transition period to allow alternative sustainable employment opportunities to be developed.

There would be less potential for an indigenous biomass industry to develop also as the significant biomass demand created by the proposal would not materialise. This alternative does not support project Objectives 1, 2 or 3.

3.3 Alternative 2 - Continued Peat Fuelled Energy Generation

The WOP station planning permission will terminate in December 2020. An application could be made for a new planning permission to extend the operational life of the plant and ADF for a defined period maintaining 100% reliance on peat. Peat would continue to be delivered by Bord na Móna to WOP station as previously and ash would continue to be delivered to the ADF.

This option would support Objective 2 by contributing strategically to the socio-economic well-being of the Irish State and the Eastern and Midland Region but would not achieve Objectives 1 or 3 as significant carbon emission would continue

to occur in the longer term. There would be significant emissions of GHGs arising in this scenario, at the same rate as currently exists with no stepwise reduction and no increase in renewable energy generation.

Similar to the Do Nothing scenario there would be less potential for an indigenous biomass industry to develop also as the significant biomass demand created by the proposed development would not materialise. The environmental impact of the alternative would be significant and negative for the duration of operation of the plant.

This option would be limited in its timeline to the cessation of peat harvesting and supply by Bord na Móna.

3.4 Alternative 3 - Immediate Switching to Biomass only

Subject to planning approval, WOP station could be fired on biomass only post 2020, i.e. no peat would be combusted to generate energy at the facility after 2020.

The existing station was specifically designed to generate electricity from the combustion of peat. Significant investment is required in fuel handling and storage of biomass but the combustion of biomass only to generate electricity is technically feasible without significant modification to the existing plant.

However, as detailed in Para. 3.3.2.1 of the Planning Report (Document Ref. QS-000206-01-R460-005), this scenario is not feasible because the co-firing stage is necessary to:

- accommodate the orderly transition of the Midlands economy away from a reliance on peat harvesting - something that has been in place since the 1950's, in-line with a range of prevailing planning policies in relation to the transition of the Midlands economy, targets for the growth of the renewables sector, and the fostering of the green and rural economy, and the strategic objective of Bord na Móna's to cease peat harvesting for energy generation by 2030.
- ensure project viability – which at present relies on the availability of REFIT 3 supports for biomass firing at the station (which is currently available only up to a maximum of 394 GWhrs per year - about 30% of the installed electrical generation capacity), which are insufficient to cover the fixed and variable operating costs of the station. There will be no financial support to generate electricity from peat firing at the station. Peat co-firing is necessary until the level of biomass support increases and until sufficient indigenous biomass becomes available. In respect of that indigenous biomass, reference is made to the COFORD Report – the **All Ireland Roundwood Production Forecast, 2016-2035** (see Para.3.3.2.1, Planning Report) and the available commentary around the increased availability of indigenous biomass.

In the period 2020 to 2027, it is anticipated that the indigenous biomass industry will begin to yield additional volumes of fuel as the Midlands stations (WOP, LRP and Edenderry Power Ltd.) create a market demand for this material, thereby stimulating the expansion of the industry.

From 2020, there will potentially be Government support (in policy and fiscal terms) to the agricultural sector for the development of short rotation energy crops e.g. willow. This would also increase the supply of indigenous biomass. It is reasonable to expect that the development of appropriate administrative structures for management of this support will take c. 36 months to be established. This will be followed by the planting of crops and - noting that willow needs three to four years to initially develop with a greater yield occurring in the second rotation, significant volumes of these crops will likely only become commercial available in the mid-2020s.

Similarly, post 2020 onwards there will be a marked increase in the availability of indigenous biomass from the forestry sector (public and private) as maturing forests reach thinning and harvestable age. This is supported by the COFORD Report which identified that roundwood supply would increase significantly over the next two decades, with almost all of the increase coming from privately-owned forests in the Republic of Ireland and primarily in the larger size assortments. As described in the Planning Report (see **Figure 4-4** in **Chapter 4** of this EIAR, which is extracted from Page iv, COFORD Report), the major increase in supply occurs from 2020 on with significant supply from private forestry occurring from 2024.

The significant potential to expand the bioenergy resource in Ireland to 2035 is further borne out in the SEAI Report, Bioenergy Supply in Ireland 2017-2035¹ which highlighted a potential seven-fold increase in bioenergy resource as follows:

“The bioenergy resource in Ireland has significant potential to expand between now and 2035. Realisation of this potential is dependent on higher market prices than currently prevail for most resource types for bioenergy as well as mitigation of the supply-side barriers to resource development. Under favourable conditions with high market prices for bioenergy resources and mitigation of supply-side barriers, the total amount of solid, liquid and gaseous bioenergy produced in Ireland could reach 3,290 (kilotonne of oil equivalent) ktoe (138 PJ) by 2035². This compares to total primary energy demand of bioenergy, including imports, of 468 ktoe (19.6 PJ) in 2014”.

The increased availability of indigenous biomass will therefore likely only come about from the mid 2020's by which time the indigenous sector can realistically begin to meet projected biomass demand.

¹ SEAI and Ricardo Energy & Environment, Bioenergy Supply in Ireland, 2015 – 2035, An update of potential resource quantities and costs, Ver 1.2, 10/17

² A tonne of oil equivalent (toe) is the conventional standardised unit of energy and is defined on the basis of a tonne of oil having a net calorific value of 41,686kJ/kg. In terms of electricity production 1 toe is required to produce 11.63 Megawatt hours of electricity (see SEAI conversion factors <http://www.seai.ie/resources/seai-statistics/conversion-factors/>)

- ESB has committed that biomass which will be utilised for energy electricity generation purposes will meet strict sustainability criteria which are fully in line with the proposed requirements of RED II (see EIAR, **Section 4.4.3**). It is anticipated that although many suppliers will meet these criteria due to existing safeguards (Forest Stewardship Council (FSC) and Programme for the Endorsement of Forest Certification (PEFC) for sustainable forests for example) there will be a learning curve for both indigenous and International suppliers in this respect. Time is therefore needed to enable these new systems and protocols to become established – and critically to protect the integrity of the transition by ensuring all material suppliers are subject to correct due diligence checks.

This alternative would support Objectives 1 and 3 but there would be a fundamental conflict with Objective 2 in terms of socio economic impact albeit in the medium term (till 2027).

3.5 Alternative 4 - Transition to 100% Biomass in 2030

It was initially proposed that the combustion of peat at WOP station would continue until 2030 with WOP station continuing in use with reducing quantities of peat combustion and increasing quantities of biomass use until 2030 when the station would be fully fuelled by biomass.

A fuel profile based on this date was provided to Stakeholders in the Project Scoping and Screening document, discussed with An Bord Pleanála at pre-application meetings, and also publicised at the public open day.

The pre-application discussions with An Bord Pleanála informed various aspects of the project development including the duration of this initial co-firing period. Following those discussions the commercial and technical model for the project was re-considered to ensure that the use of peat as a fuel was ceased at the earliest possible opportunity. The proposed development transition date of end 2027 was identified from that process.

This decision was further supported by Bord na Móna's commitment to accelerate decarbonisation by fast tracking renewable energy and higher value recycling plans and bringing forward the end of energy from peat³. Key points in the company's decarbonisation plan include:

- “The complete end of using peat for energy brought forward by two years to 2028”

³<https://www.bordnamona.ie/company/news/articles/bord-na-mona-accelerates-decarbonisation/>

- “An immediate steep reduction in peat volumes down from a recent high of 6.5million tonnes (mt) in 2013 to 2mt in 2020. Fast-tracking peat reduction and cessation will carry a significant associated reduction in carbon emissions.”

Delaying the cessation of peat-burning to the end of 2030 would give rise to additional CO₂ emissions which do not aid in the achievement of Objectives 1 and 3 of the project.

3.6 Alternative 5 - Firing on Natural Gas

The WOP station is connected to the National grid through both the 110kV and 220kV transmission system network. The development of a natural gas fuelled generator at the site is therefore technically feasible, depending on a number of other considerations.

The potential for developing a Combined Cycle Gas Turbine (CCGT) station on the existing site has been examined. This option would require a connection of significant scale to the National gas grid, which currently passes through Mullingar, Athlone and Ballinasloe on route to the west. To facilitate a CCGT on this site, it would be necessary to construct a circa 15km gas pipeline from Ballinasloe, and also to upgrade the electricity transmission infrastructure to accommodate a typically larger CCGT station. To facilitate this development, the existing WOP station would be decommissioned and demolished as it is understood that the only existing infrastructure that could be utilised are the hard stand areas and the adjacent electrical substation with modifications. The major constraint to this redevelopment would be the existing grid capacity - which is not sufficient to support the export from a modern gas turbine plant at an economic scale. The requirement to decommissioning the existing station, build a gas pipe line spur and significant gas connection, construct a new CCGT and undertake the necessary grid upgrades would require a significant capital investment. Although significantly lower than GHG emissions for the peat fuelled station, there would still be GHG emissions from a gas fired power station. Having regard to these constraints, the alternative of developing a modern gas fired electricity generating station on the site is therefore not considered feasible and could take up to a decade to develop if viable. In reality CCGT would not be commercially viable at the scale of 150MWe to replace the capacity of WOP.

The potential for a gas peaking plant has also been examined. A gas peaking plant, is an electricity generating plant that generally runs only when there is a high demand, known as peak demand, for electricity. As they only run to meet peak demand the power supplied commands a much higher price per kilowatt hour than base load power which a typical large scale CCGT plant would provide. Similar to the CCGT, a circa 15km gas pipeline from Ballinasloe would also be required. The existing transmission infrastructure could support this option. To facilitate this development, the existing WOP station would need to be decommissioned and

demolished and it is understood that again the only existing infrastructure that could be utilised are the hard stand areas and the adjacent electrical substation with modifications. There would be very limited employment associated with this type of development and the overall output capacity would be minor.

This alternative – the development of a natural gas fuelled generator at this location, would partially support Objectives 3 in terms of diversification of fuel supply but would not support Objectives 1 and 2.

3.7 Alternative 6 - Solar Photovoltaic Energy Generation

The WOP station is connected to the National grid through both the 110kV and 220kV transmission system network. The site therefore has potential to accommodate a solar photovoltaic array.

To facilitate this development, the existing WOP station would need to be decommissioned and demolished. The site constraints would dictate the size and scale of any such development and there would be a significantly reduced export of electricity in comparison to the existing WOP station. Typically a physical area of 2 hectares would be required to produce 1MW of installed electricity generation. If the entire WOP development site area (35.5 hectares) were available for solar PV development this would allow generation of c. 17.5 MW of electrical power which is significantly lower than the proposed development. This would also not be dispatchable renewable energy and would be dependent on climatic conditions. Given the proximity of the existing transmission lines, the development could readily be grid connected. There would be very limited employment associated with this type of development and the plant output would be minor.

This alternative would partially support Objectives 1 and 3 in terms of diversification of fuel supply, but the nature of solar is such that that it is an intermittent generation source. It would likely not support Objective 2.

3.8 Alternative 7 - Energy Storage

Energy storage developments such as battery storage and flywheels which would be used to store excess renewable energy from existing wind or solar photovoltaic developments could be developed on the site. These devices do not generate primary energy themselves but would extend the use of renewable energy by storing excess and curtailed capacity.

This type of development would provide dispatchable energy to the grid and would provide an essential grid service. There would be very limited employment levels associated with this type of development.

This alternative would partially support Objective 1 - in terms of supporting renewable energy but would not support Objectives 2 and 3.

3.9 Alternative 8 - Alternative Landfill Options

In addition to looking at alternatives for WOP station, potential alternatives for the dedicated ADF were also explored.

This is a not a 'stand-alone' alternative as the requirement for additional disposal capacity only arises where WOP station continues to operate – whether fuelled by peat, or as proposed, by transitioning to full biomass.

3.9.1 Alternative 8.1 - Seek an alternative licenced disposal site

The ESB could enter into a commercial arrangement for the disposal of the ash from WOP station at an alternative existing licenced site.

The disposal at an alternative site would give rise to more significant ash haul distances as the ADF site is the closest licensed disposal site to the WOP station. At present ash is transported by rail to this site, but any alternative location would likely give rise to transport by road – which is less favourable than continued transport by rail.

Additionally, planning permission could be required at the alternative site to accommodate ash from the station which if delayed or refused would lead to the closure of WOP with associated significant negative socio economic impacts.

This alternative would support Objectives 1, 2 and 3 if it were viable as it would provide the required landfill for any ash generated by the project.

3.9.2 Alternative 8.2 - Develop an alternative licenced disposal site

The ESB could seek permission to develop an additional external landfill site.

This would likely necessitate the development of a greenfield site. Again - unless that site was located along the existing Bord na Móna rail network, traffic movements to the new licence disposal site would likely result in longer haulage routes than to the existing ADF facility. In planning and environmental terms the duplication of the infrastructure for a second landfill site is less desirable than fully utilising the existing facility and infrastructure.

Additionally, if planning permission were delayed or refused this would lead to the closure of WOP with associated significant negative socio economic impacts.

This alternative would support Objectives 1, 2 and 3 if it were viable as it would provide the required landfill for any ash generated by the project.

3.10 Alternative 9 - Alternative Fuel Transport Options

Alternative methods of fuel delivery have been explored. This is not a 'stand-alone' alternative as the requirement for fuel transport only arises where WOP station continues to operate – whether fuelled by peat, or as proposed, by transitioning to full biomass.

Currently peat fuel is delivered to WOP station by the Bord na Móna internal rail network and, to a lesser extent, by road transport. Bord na Móna operates and maintains this internal rail network and its own dedicated rolling stock. Trains are loaded at the peat stockpiled areas and offloaded directly to the station. The rail network does not serve all of the supply bogs providing peat to WOP. Deliveries by road transport also involve loading of peat into moving floor heavy goods vehicles from the peat stockpiled areas and unloading directly at the station.

The proposed development would necessitate peat deliveries continuing - on a reducing basis, to the end of 2027, with deliveries by road and rail. Biomass deliveries are proposed to be delivered by road haulage only. Biomass will be delivered from multiple sources – including state and private forest operations, sawmills, and ports. Road traffic will utilise the existing National road network converging on the station in Shannonbridge in a controlled scheduled manner.

A potential alternative to road haulage of biomass would be to use the existing Bord na Móna rail network to deliver biomass fuel to selected transfer locations in proximity to the National road network. It would be off-loaded at these locations and transferred to rail wagons for onward delivery to the power station. This option has been examined in detail by Bord na Móna. Although technically feasible the added financial cost of transferring biomass to a rail delivery system would render the project economically non-viable.

This option is therefore not feasible as it would render the project uneconomic to generate energy from biomass. The plant would therefore either not operate, or operate on a very limited basis and would not achieve Objective 1, 2 or 3.

3.11 Alternative 10 - Alternative Design

As part of the project development, alternative configurations on the WOP site were considered. In particular, alternative designs for biomass storage locations and feed to the generating station were examined.

The site of the former (decommissioned and demolished) Shannonbridge station is in the ownership of a third party and was excluded from the consideration of alternatives on the basis that this land is not under the control of the ESB.

The former ash landfill storage area (to the immediate north of the WOP station) was considered as a potential location for biomass storage. That area is within ESB ownership though not within the station IE Licenced site boundary. It is separated from the WOP station site by the northern station access road. Development here would entail excavation of the former ash storage area,

construction of embankments and a large concrete slab storage area could be developed here which could accommodate up to ten days of biomass storage. An elevated conveyor system would be required to feed the biomass to the station's existing fuel handling system. This area is closer to residential and mixed use development in the centre of Shannonbridge, and this proximity would increase the potential for noise and visual impact on sensitive receptors. Ecological surveys of the area indicate the presence of a badger sett within the likely development area, which would necessitate relocation of the animals. The development costs for this alternative are estimated as being significantly higher than that proposed thereby increasing the commercial risk to the project.

This alternative would give rise to the permanent loss of the rehabilitated former ash repository area and the displacement of an active badger sett. There would be increased potential for noise impact on the nearest noise sensitive locations and of more significant visual impacts due to the closer proximity of the biomass storage area. It is technically feasible but with potentially more significant environmental impacts – albeit impacts capable of being mitigated, and an associated significant increase in development costs. For this reason the site was excluded as an alternative option.

Alternative biomass storage solutions (various sizes and scales of storage solutions) were also considered. To minimise the storage requirement a 'just-in-time' design basis for the biomass delivery and usage on site was adopted as the best option. An initial design of two pellet silos was considered but this was reduced to one silo based on a 'just-in-time' delivery and cost considerations basis. Sufficient storage can be provided to allow for plant operations and minimise deliveries to 6-days a week (excluding Sunday).

As the alternative biomass storage option is technically feasible with mitigation of potential environmental impacts it is considered to meet Objectives 1, 2 and 3.

3.12 Summary of Alternative Assessment and Environmental Considerations

The key considerations in assessing the alternatives to the proposed development are provided in **Table 3-2** and **Table 3-3** Alternatives Considered. This includes an assessment of all topics for comparison purposes.

Table 3-2: Assessment of Alternatives Considered

| Subject Area | Alternatives Considered | | | | |
|------------------------------------|--|--|--|---|--|
| | Proposed Development | Alternative 1 – ‘Do Nothing’ | Alternative 2 – Continued Peat Fuelled Energy Generation | Alternative 3 – Immediate Switching to Biomass Only | Alternative 4 – Transition to 100% Biomass in 2030 |
| Population and Human Health | <p>WOP station will continue in use with reducing quantities of peat combustion and increasing quantities of biomass use until 2027 after which the station is fully fuelled by biomass.</p> <p>There will be minor modifications to the existing plant, and the biomass storage slabs and silo will be developed. The continued use of the existing infrastructure minimises economic cost.</p> <p>Fuel deliveries by road (mainly biomass) will increase, giving rise to greater HGV movements in the area. It is expected that after 2027 when the station operates on full biomass, there will be an average of 100 HGV deliveries per day, spread over a 16 hour working day. Deliveries will operate in accordance with a strict Traffic Management Plan.</p> <p>There will be significant, positive, on-going socio-economic benefits to the midland region arising from the continued operation of WOP, the ADF and indirect fuel supply operations – both peat and biomass. This will be in the form of annual Local Authority rates, direct and indirect employment and direct economic contribution by the station.</p> <p>The biomass demand created by the station will likely stimulate the development of an indigenous commercial biomass supply chain – namely crops such as willow, providing additional or alternative agricultural income. The development of such an indigenous biofuel industry will also support any Government renewable heat initiative to reduce carbon emissions in the heating sector.</p> <p>The station will continue to have a thermal plume footprint in the Shannon River, arising from the on-going requirement for thermal cooling water discharge.</p> | <p>WOP station and ADF would close and be decommissioned.</p> <p>There would be minor potential impacts on human health during the decommissioning of the power station due to demolition and the completion of site reinstatement works - in the form of noise and fugitive dust. There would be no potential for impact on human health post decommissioning.</p> <p>There would be no air emissions or noise associated with the continued operation of the WOP station, delivery of fuels or landfill operations other than vehicle noise from occasional post closure aftercare visits.</p> <p>There would be a very significant negative socio-economic impact on the Midlands area with loss of rates to the local authority; loss of employment (direct and indirect) and loss of local spend in the Shannonbridge area.</p> <p>The thermal cooling water emission to the Shannon would cease. This could have an indirect negative effect on the presence of coarse angling in the Shannonbridge area with consequent loss of tourism revenue.</p> <p>The lack of a large scale market demand for biomass as a result of the plants closure would reduce the potential for development of an indigenous biomass industry for energy purposes, delaying supply chain development which in turn would not support decarbonisation in the heating sector. The lack of a sufficiently large indigenous biomass supply chain would increase requirement for imported biomass</p> | <p>This option is not considered feasible but if it were WOP station would continue to generate energy from the combustion of peat the following would be relevant:</p> <p>There would be no modifications to the existing plant and equipment. There is therefore no economic cost in modifying the existing station.</p> <p>Ash from peat combustion would continue to be delivered by rail to the extended landfill site at the existing landfill location in covered wagons.</p> <p>There would be potential for air emissions from the station, in the form of dust, SO_x and NO_x that could impact on the local population. However, the station would operate under an IE Licence and within strict emissions limits values to protect the environment and public health. The station's emission stack is fitted with bag filters to control dust, and NO_x and SO_x abatement equipment. These measures would continue to ensure the station meets the IE Licence requirements.</p> <p>The delivery of peat would continue – primarily by rail with some deliveries by road.</p> <p>There would be continued long-term significant socio-economic benefits to the Midlands region, due to the continued operation of the existing WOP station and ash landfill. There would also be positive socio-economic impacts arising from the indirect peat supply operations. This would be in the form of annual Local Authority rates, direct and indirect employment and direct economic contribution by the</p> | <p>At the current level of Biomass support under REFIT3, WOP station could not continue in use fuelled by biomass only as the fixed and variable costs of the station would be in excess of the revenues.</p> <p>If REFIT 3 support were to be increased ,or alternative support were available and sufficient biomass became commercially available to the extent that WOP station would continue in use fuelled by biomass only the following would be relevant:</p> <p>There would be minor modifications to the existing plant and the biomass storage slabs and silo would be developed. The continued use of the existing infrastructure would minimise economic cost.</p> <p>Ash arising from combustion would continue to be delivered by rail in covered wagons, to the extended ADF.</p> <p>There would be potential for air emissions from the station, in the form of dust, SO_x and NO_x that could impact on the local population. However, the station would operate under an IE Licence and within strict emissions limits values to protect the environment and public health. The station's emission stack is fitted with bag filters to control dust, and NO_x and SO_x abatement equipment. These measures would continue to ensure the station meets the IE Licence requirements.</p> <p>Fuel deliveries by road (mainly biomass) would increase, giving rise to greater HGV movements in the area. It is expected that after 2030 when the station operates on full biomass, there would be an average of 100 HGV deliveries per day, spread over a 16 hour working day. Deliveries would operate in accordance with a strict Traffic Management Plan.</p> <p>There would be significant, positive, on-going socio-economic benefits to</p> | |

| Subject Area | Alternatives Considered | | | | |
|---------------------|--|--|--|--|---|
| | Proposed Development | Alternative 1 – ‘ Do Nothing’ | Alternative 2 – Continued Peat Fuelled Energy Generation | Alternative 3 – Immediate Switching to Biomass Only | Alternative 4 – Transition to 100% Biomass in 2030 |
| | | reducing energy security. | <p>station.</p> <p>The station would continue to have a thermal plume footprint in the Shannon River, arising from the on-going requirement for thermal cooling water discharge.</p> | <p>working day. Deliveries would operate in accordance with a strict Traffic Management Plan.</p> <p>There would be continued socio-economic benefit to the midland region from the continued operation of the existing WOP station and ADF. This would be in the form of annual Local Authority rates, direct and indirect employment and direct economic contribution by the station.</p> <p>However, there would be no peat harvesting or associated delivery operations to supply the station. This would cause a permanent, significant and negative socio-economic impact on the Midlands region with the loss of significant revenue to Bord na Móna, giving rise to significant job losses.</p> <p>Firing on biomass only would create a demand for biomass, which could stimulate an indigenous commercial biomass supply chain providing supplementary or alternative agricultural income and trade. The growth of that indigenous industry would assist in the implementation of a renewable heat initiative, aimed at reducing carbon emissions in the heating sector.</p> <p>It is unknown whether support for the full output of the plant would be available. This would undermine the financial viability of the station.</p> <p>The station would continue to have a thermal plume footprint in the Shannon River, arising from the on-going requirement for thermal cooling water discharge.</p> | <p>the midland region arising from the continued operation of WOP, the ADF and indirect fuel supply operations – both peat and biomass. This would be in the form of annual Local Authority rates, direct and indirect employment and direct economic contribution by the station.</p> <p>The biomass demand created by the station would likely stimulate the development of an indigenous commercial biomass supply chain – namely crops such as willow, providing additional or alternative agricultural income. The development of such an indigenous biofuel industry would also support any Government renewable heat initiative to reduce carbon emissions in the heating sector.</p> <p>The station would continue to have a thermal plume footprint in the Shannon River, arising from the on-going requirement for thermal cooling water discharge.</p> |
| Biodiversity | There will be no increase in the footprint of the WOP station and any associated development required to facilitate biomass handling and | There would be minor biodiversity gain from the closure and restoration of the WOP station site and existing ash | There would be no increase in the footprint of the WOP station. Hence there would be no direct significant | WOP station would continue in use fuelled by biomass only. There would be no increase in the | There would be no increase in the footprint of the WOP station and any associated development required to |

| Subject Area | Alternatives Considered | | | | |
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| | Proposed Development | Alternative 1 – ‘ Do Nothing’ | Alternative 2 – Continued Peat Fuelled Energy Generation | Alternative 3 – Immediate Switching to Biomass Only | Alternative 4 – Transition to 100% Biomass in 2030 |
| | <p>storage will take place within the existing station footprint. Hence there will be no direct significant impact on biodiversity arising at the WOP station itself.</p> <p>There is no significant impact on aquatic ecology arising from the thermal cooling water plume mixing zone within the Shannon River. This is limited in spatial extent and the river quickly recovers its status outside the mixing zone of the thermal plume.</p> <p>At the ADF, additional cells will be developed. There will therefore be a minor loss of local biodiversity.</p> <p>Increased numbers of vehicles transporting fuel to the station may impact on air quality and noise levels. This could potentially impact on biodiversity.</p> <p>Peat harvesting to supply WOP station to the end of 2027 will occur from existing peat extraction areas and no new bog will be developed for this purpose. There will be minor impact on local biodiversity from the harvest operations. Feasible rehabilitation of these peat bog areas will be delayed until peat harvesting is ended.</p> <p>Extractive pressure from peat harvesting on surface water aquatic ecology from peat harvesting associated with WOP supply will reduce to the end of 2027. Aquatic ecology will improve in the long term.</p> | <p>landfill. These impacts are comparable to those that would occur in any event upon final closure of the landfill and plant, under the requirement of the EPA IE Licence for the facility.</p> <p>If rehabilitation of the peat supply bogs providing peat to WOP station only was to occur there would be an increase in habitat type and associated local biodiversity over time. This would have a significant positive benefit in the long term.</p> <p>There would be a similar improvement in aquatic ecology over time.</p> | <p>impact on biodiversity arising at the WOP station itself.</p> <p>There would be no significant impact on aquatic ecology arising from the continued thermal cooling water plume mixing zone within the Shannon River. The spatial extent of the plume would continue to be limited, and the river quickly recovers its status outside the mixing zone.</p> <p>At the ADF, additional cells would be developed. There would therefore be a minor loss of local biodiversity.</p> <p>Rehabilitation of the peat bogs would be delayed and there would be no reduction on extractive pressure from peat harvesting on aquatic ecology until this operation ceased.</p> | <p>footprint of the WOP station and any associated development required to facilitate biomass handling and storage would take place within the existing station footprint. Hence there would no direct significant impact on biodiversity arising at the WOP station itself.</p> <p>There would be no significant impact on aquatic ecology arising from the thermal cooling water plume mixing zone within the Shannon River. The plume would remain but it would be limited in spatial extent and the river would continue to quickly recover its status outside the mixing zone.</p> <p>At the ADF, additional cells would be developed. There would therefore be a minor loss of local biodiversity.</p> <p>Increased numbers of vehicles transporting fuel to the station could impact on air quality and noise levels. This could potentially impact on biodiversity.</p> <p>Peat harvesting operations to supply WOP would terminate. Feasible rehabilitation of these peat bog areas would be implemented by Bord na Móna leading to positive significant impact on biodiversity in the long term.</p> <p>Extractive pressure from peat harvesting on surface water aquatic ecology from peat harvesting would also cease. Aquatic ecology would improve in the long term.</p> | <p>facilitate biomass handling and storage would take place within the existing station footprint. Hence there would be no direct significant impact on biodiversity at the WOP station itself.</p> <p>There would be no significant impact on aquatic ecology arising from the thermal cooling water plume mixing zone within the Shannon River. This would be limited in spatial extent and the river would continue to quickly recover its status outside the mixing zone.</p> <p>At the ADF, additional cells would be developed. There would therefore be a minor loss of local biodiversity.</p> <p>Increased numbers of vehicles transporting fuel to the station may impact on air quality and noise levels. This could potentially impact on biodiversity.</p> <p>Rehabilitation of the peat supply bogs would be delayed with delay in biodiversity enhancement.</p> |
| Land, Soil, Geology & Hydrogeology | <p>No additional land take at WOP station as part of the development. Increased land take at the ADF will be required for additional cells.</p> <p>Within the station Slab A will be constructed on made ground. Slab B will be constructed on soil and made ground. Excavation of made ground and soil will be required. Material will be reused or disposed of to a licenced waste</p> | <p>Peat harvesting operations would cease and there would be no impacts on soil, geology or hydrogeology. Closure of the WOP station and the associated landfill would be in accordance with the IE Licence for the site and specifically in accordance with the Decommissioning Management</p> | <p>Land take required for an extension of the ADF. No development of biomass storage slabs or pellet silos on site.</p> <p>Excavated soils would be used to construct the landfill embankments. No geological impacts would occur.</p> <p>The WOP station and licenced landfill</p> | <p>The impacts on land take; soils and geology would be the same as the proposed development as the development elements relate principally to the biomass fuel use at the site.</p> <p>The WOP station and licenced landfill would continue to operate under the</p> | <p>Impacts on land soil geology and hydrogeology would be similar to the proposed development with respect to the WOP station and ADF. But potential impact from peat harvesting operations would reduce over a longer time period and would cease at the end of 2030.</p> |

| Subject Area | Alternatives Considered | | | | |
|---------------|---|---|---|--|---|
| | Proposed Development | Alternative 1 – ‘ Do Nothing’ | Alternative 2 – Continued Peat Fuelled Energy Generation | Alternative 3 – Immediate Switching to Biomass Only | Alternative 4 – Transition to 100% Biomass in 2030 |
| | <p>disposal facility.</p> <p>At the ADF soil excavated as part of the cell development will be reused for embankment construction.</p> <p>No impact on geology is predicted</p> <p>The WOP station and licenced landfill will continue to operate under the conditions of the IE Licence. There are no direct discharges from the WOP station to the groundwater. There is some potential for short term contamination of groundwater to occur during construction of the biomass storage slabs and ADF cells. This will be mitigated by good engineering practice.</p> <p>The existing ADF is lined and completed cells are capped to ensure there will be no potential for leachate to access groundwater. New cells developed to facilitate the continued operation of WOP station will also be lined, filled and capped on completion to ensure no leachate accesses the groundwater.</p> <p>Peat will continue to be extracted from existing peat bogs and from the existing peat harvest footprint areas to the end of 2027 but with reducing quantities. There will be no additional land take area required. No significant impact on geology or hydrogeology is predicted to occur</p> <p>The impact on groundwater will not be significant.</p> | <p>Plan, and Closure Restoration and Aftercare Management Plan.</p> <p>Land take would not occur at the ADF and there would be no soil or geological impact</p> <p>There would be no significant risk to groundwater quality.</p> | <p>would continue to operate under the conditions of the IE Licence. There are no direct discharges from the WOP station to the groundwater. There is some potential for short term contamination of groundwater to occur during construction of the additional ADF cells. This would be mitigated by good engineering practice.</p> <p>The existing ADF is lined and completed cells are capped to ensure there would be no potential for leachate to access groundwater. New cells developed to facilitate the continued operation of WOP station would also be lined, filled and capped on completion to ensure no leachate accesses the groundwater.</p> <p>The impact on groundwater would not be significant.</p> <p>The impacts from peat harvesting operations would be similar to the proposed development but would reduce and finish at the end of 2027.</p> | <p>conditions of the IE Licence. There are no direct discharges from the WOP station to the groundwater. There is some potential for short term contamination of groundwater to occur during construction of the biomass storage slabs and ADF cells. This would be mitigated by good engineering practice.</p> <p>The existing ADF is lined and completed cells are capped to ensure there would be no potential for leachate to access groundwater. New cells developed to facilitate the continued operation of WOP station would also be lined, filled and capped on completion to ensure no leachate accesses the groundwater.</p> <p>The impact on groundwater would not be significant.</p> | |
| Surface Water | <p>The licenced WOP station and ADF will continue to operate in accordance with the requirements of the IE Licence issued by the EPA. The footprint of the station will not change but there will be additional open biomass storage areas – with associated drainage requirements. Drainage from these areas will be integrated into the existing on-site drainage system and will discharge to the Shannon River. No significant impact on the receiving water is expected.</p> | <p>Closure of the WOP station and associated landfill would be in accordance with the IE Licence for the site and the Decommissioning Management Plan and Closure Restoration and Aftercare Management Plan, agreed with the EPA. There would be no significant risk to surface water quality.</p> <p>There would be no thermal load discharge to the River Shannon arising</p> | <p>The licenced WOP station and ADF would continue to operate in accordance with the requirements of the IE Licence issued by the EPA. The footprint of the station would not change. On the station site, the existing drainage would continue to operate and discharge surface water runoff to the Shannon River via the existing drainage network. No significant impact on the receiving</p> | <p>The licenced WOP station and ADF would continue to operate in accordance with the requirements of the IE Licence issued by the EPA. The footprint of the station would not change but there would be additional open biomass storage areas – with associated drainage requirements. Drainage from these areas would be integrated into the existing on-site drainage system and would discharge to the Shannon River. No significant</p> | <p>The licenced WOP station and ADF would continue to operate in accordance with the requirements of the IE Licence issued by the EPA. The footprint of the station would not change but there would be additional open biomass storage areas – with associated drainage requirements. Drainage from these areas would be integrated into the existing on-site drainage system and would discharge to the Shannon River. No significant</p> |

| Subject Area | Alternatives Considered | | | | |
|------------------------|--|--|--|---|--|
| | Proposed Development | Alternative 1 – ‘ Do Nothing’ | Alternative 2 – Continued Peat Fuelled Energy Generation | Alternative 3 – Immediate Switching to Biomass Only | Alternative 4 – Transition to 100% Biomass in 2030 |
| | <p>Thermal cooling water from the station will continue to discharge to the Shannon River. There will be no increase in thermal load from the existing situation.</p> <p>The ADF will be extended. That facility will continue to be developed on a cell-by-cell basis in accordance with the IE Licence and the associated landfill operational plan, approved by the EPA. New ash landfill cells will be lined and drained in accordance with the licence and capped on completion. No significant impact from the landfill runoff or leachate is anticipated.</p> <p>Peat harvesting operations will continue to have potential impact on surface water but this will reduce to the end of 2027 and with the implementation of Bord na Móna rehabilitation plans extractive pressure on surface water quality potential impact will cease in the long term.</p> | <p>from the cooling water. This would likely result in a minor improvement in the status of that water body as there would no longer be a thermal plume mixing zone within the river.</p> <p>Peat harvesting operations would cease and with the implementation of Bord na Móna rehabilitation plans extractive pressure on surface water quality potential impact would cease in the long term.</p> | <p>water is expected.</p> <p>Thermal cooling water from the station would continue to discharge to the Shannon River. There would be no increase in thermal load from the existing situation.</p> <p>The ADF would be extended. That facility would continue to be developed on a cell-by-cell basis in accordance with the IE Licence and the associated landfill operational plan, approved by the EPA. New ash landfill cells would be lined and drained in accordance with the licence and capped on completion. No significant impact from the landfill runoff or leachate is anticipated.</p> <p>Rehabilitation of the peat supply bogs and associated benefit to surface water quality would be delayed until WOP station closed.</p> | <p>impact on the receiving water is expected.</p> <p>Thermal cooling water from the station would continue to discharge to the Shannon River. There would be no increase in thermal load from the existing situation.</p> <p>The ADF would be extended. That facility would continue to be developed on a cell-by-cell basis in accordance with the IE Licence and the associated landfill operational plan, approved by the EPA. That facility would handle decreased volumes of ash when the station is fuelled by biomass. New ash landfill cells would be lined and drained in accordance with the licence and capped on completion. No significant impact from the landfill runoff or leachate is anticipated.</p> <p>Peat harvesting operations would cease and with the implementation of Bord na Móna rehabilitation plans extractive pressure on surface water quality potential impact would cease in the long term</p> | <p>impact on the receiving water is expected.</p> <p>Thermal cooling water from the station would continue to discharge to the Shannon River. There would be no increase in thermal load from the existing situation.</p> <p>The ADF would be extended. That facility would continue to be developed on a cell-by-cell basis in accordance with the IE Licence and the associated landfill operational plan, approved by the EPA. New ash landfill cells would be lined and drained in accordance with the licence and capped on completion. No significant impact from the landfill runoff or leachate is anticipated.</p> <p>Rehabilitation of the peat supply bogs and associated benefit to surface water quality would be delayed to the end of 2030.</p> |
| Noise | <p>Noise will continue to be generated from station operations, and arising due to fuel deliveries - by both rail and road.</p> <p>Noise associated with the ash delivery and landfill activity – which is confined to a remote site, will also occur.</p> <p>Noise levels will be in-line with limits set out in the IE Licence, to protect human health.</p> | <p>There would be no noise associated with the continued operation of the WOP station, delivery of fuels or landfill operations other than vehicle noise from occasional post closure aftercare visits.</p> <p>There would be temporary noise and dust emissions associated with the decommissioning and subsequent demolition of the station.</p> <p>Noise levels will be in-line with limits set out in the IE Licence, to protect human health.</p> | <p>Noise would continue to be generated from station operations, and arising due to fuel deliveries - by both rail and road.</p> <p>Noise associated with the ash delivery and landfill activity – which is confined to a remote site, would also occur.</p> <p>Noise levels would be in-line with limits set out in the IE Licence, to protect human health</p> | <p>Noise would continue to be generated from station operations, and arising due to fuel deliveries - by both rail and road.</p> <p>Noise associated with the ash delivery and landfill activity – which is confined to a remote site, would also occur.</p> <p>Noise levels would be in-line with limits set out in the IE Licence, to protect human health.</p> | <p>Noise would continue to be generated from station operations, and arising due to fuel deliveries - by both rail and road.</p> <p>Noise associated with the ash delivery and landfill activity – which is confined to a remote site, would also occur.</p> <p>Noise levels would be in-line with limits set out in the IE Licence, to protect human health.</p> |
| Climate and Air | GHG emissions from WOP station will | Closure of the WOP station would | GHG emissions from WOP station | Fuelled exclusively by biomass, WOP | GHG emissions from WOP station |

| Subject Area | Alternatives Considered | | | | |
|------------------------|---|---|--|--|--|
| | Proposed Development | Alternative 1 – ‘ Do Nothing’ | Alternative 2 – Continued Peat Fuelled Energy Generation | Alternative 3 – Immediate Switching to Biomass Only | Alternative 4 – Transition to 100% Biomass in 2030 |
| | <p>continue under the European Emission Trading Scheme and in-line with the IE Licence. From the initial co-firing stage there will be an immediate 40% reduction in carbon emissions as biomass displaces peat in the fuel mix. WOP will operate with reducing carbon emissions purchasing fewer carbon allocations each year. At the end of 2027, when it will carbon zero for the biomass under the EU ETS Trading Scheme.</p> <p>Non methane volatile organic carbons will also be emitted from the station.</p> <p>There will be continued emissions of dust, SO_x and NO_x from the plant to the atmosphere, but these will be limited under the IE Licence for the station.</p> <p>The existing ADF will operate within an increased footprint. Associated with its operation there is potential for fugitive dust emissions.</p> <p>There will be continued GHG emissions due to the transport of fuel (peat and biomass), both by road and rail, the rail transport of ash, and operation of landfill machinery.</p> | <p>result in no carbon, SO_x, NO_x or dust being emitted to the atmosphere.</p> <p>In 2017, the station emitted 1.13 million tonnes of carbon dioxide under its approved greenhouse gas permit. This figure would drop to zero. During this period the station also emitted 222 tonnes of SO_x, 723 tonnes of NO_x and 4.1 tonnes of dust. In addition, 3.8 tonnes of NMVOC were emitted by the station. All of these emissions would drop to zero.</p> <p>Following closure of the landfill there is the potential for the improvement of air quality, due to the cessation of ash transportation and landfilling activities and associated fugitive dust emissions.</p> <p>Emissions associated with the harvesting and transport of peat fuel would also cease but there would likely be some indirect continued loss of carbon dioxide from peat harvesting bogs associated with the peat supply to the station for energy purposes.</p> <p>As there would no longer be a need to purchase carbon allowances under the ETS system, such allowances would remain in the EU carbon pool and likely be purchased by another fossil fuel combustion plant. In this scenario there would be no overall reduction in GHG emissions in Europe arising from the closure of WOP.</p> | <p>would continue under the European Emission Trading Scheme (ETS) and in-line with the IE Licence. For the duration of its operational life, the WOP station would operate with the same existing level of carbon emissions. Assuming peat combustion would continue at the same rate as the current operation, circa 1.13 million tonnes of CO₂ would be emitted annually. However, as the station would continue to operate under the EU Emissions Trading Scheme, the level of permissible carbon emissions would depend on the constraints imposed by the EU-ETS through the annual purchasing of carbon credits.</p> <p>Non methane volatile organic carbons would also be emitted from the station.</p> <p>There would be continued emissions to atmosphere of dust, SO_x and NO_x from the plant but these would be limited under the IE Licence for the station.</p> <p>The existing ADF would operate within an increased footprint. Associated with its operation there would be potential for fugitive dust emissions</p> <p>There would be continued GHG emissions due to the transport of fuel (peat and biomass), both by road and rail, the rail transport of ash, and operation of landfill machinery.</p> | <p>station would be carbon zero for the biomass under the EU ETS Trading Scheme.</p> <p>Non methane volatile organic carbons would also be emitted from the station.</p> <p>There would be continued emissions to atmosphere of dust, SO_x and NO_x from the plant but these would be limited under the IE Licence for the station.</p> <p>The existing ADF would operate within an increased footprint. Associated with its operation there would be potential for fugitive dust emissions</p> <p>There would be GHG emissions due to the transport of biomass, the rail transport of ash, and operation of landfill machinery.</p> | <p>would continue under the European Emission Trading Scheme and in-line with the IE Licence. From the initial co-firing stage there would be an immediate 40% reduction in carbon emissions as biomass displaces peat in the fuel mix. WOP would operate with reducing carbon emissions purchasing fewer carbon allocations each year. At the end of 2030, when it would be carbon zero for the biomass under the EU ETS Trading Scheme.</p> <p>Non methane volatile organic carbons would also be emitted from the station.</p> <p>There would be continued emissions to atmosphere of dust, SO_x and NO_x from the plant but these would be limited under the IE Licence for the station.</p> <p>The existing ADF would operate within an increased footprint. Associated with its operation there would be potential for fugitive dust emissions</p> <p>There would be continued GHG emissions due to the transport of fuel (peat and biomass), both by road and rail, the rail transport of ash, and operation of landfill machinery.</p> |
| Material Assets | <p>This does not require alterations to the existing utilities and services at WOP station, ADF or outside the boundaries of the sites themselves during the construction or operational phases.</p> | <p>This would see the closure of the WOP generation plant at the end of 2020 which would cease to be a source of electricity. The WOP station would be decommissioned in accordance with the DMP and the ADF would be closed in line with existing Closure, Restoration and Aftercare</p> | <p>This would not require alterations to the existing utilities and services at WOP station, ADF or outside the boundaries of the sites themselves during the construction or operational phases.</p> | <p>This would not require alterations to the existing utilities and services at WOP station, ADF or outside the boundaries of the sites themselves during the construction or operational phases.</p> | <p>This would not require alterations to the existing utilities and services at WOP station, ADF or outside the boundaries of the sites themselves during the construction or operational phases.</p> |

| Subject Area | Alternatives Considered | | | | |
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| | Proposed Development | Alternative 1 – ‘ Do Nothing’ | Alternative 2 – Continued Peat Fuelled Energy Generation | Alternative 3 – Immediate Switching to Biomass Only | Alternative 4 – Transition to 100% Biomass in 2030 |
| | | <p>Management Plan (CRAMP) as required. Following site decommissioning the WOP station would undergo demolition in accordance with current planning requirements.</p> <p>Integrating an equivalent amount of renewable generation elsewhere on the island of Ireland would require construction of new transmission infrastructure e.g. overhead lines and a station compound.</p> | | | |
| Traffic and Transport | <p>Peat is currently transported by rail and road to the WOP station. Under the existing planning permission daily movements of 74 vehicles are permitted. During the transition to full biomass the deliveries of peat both by rail and road will decrease and the deliveries of biomass by road transport will increase. This will comprise a 95th percentile of 129 deliveries per day over a 16 hour period with an expected daily average of 100 deliveries per day.</p> <p>Ash will continue to be transported in closed ash wagons to the ADF. There will only be a minor impact on road traffic at one level crossing.</p> | <p>Fuel transportation to the WOP station would cease.</p> <p>Ash transportation would cease.</p> <p>There would be no impact on road traffic other than during the decommissioning and demolition phase.</p> | <p>Peat is currently transported by rail and road to the WOP station. Under the existing planning permission daily movements of 74 vehicles are permitted. Rail and road peat deliveries would continue at the same level as presently.</p> <p>Ash would continue to be transported in closed ash wagons to the ADF. There would only be a minor impact on road traffic at one level crossing.</p> | <p>When firing on biomass fuel deliveries would be by road. Biomass deliveries would comprise a maximum of 129 deliveries per day over a 16 hour period with an expected daily average of 100 deliveries per day.</p> <p>Ash would continue to be transported in closed ash wagons to the ADF. There would only be a minor impact on road traffic at one level crossing.</p> | <p>Peat is currently transported by rail and road to the WOP station. Under the existing planning permission daily movements of 74 vehicles are permitted. During the transition to full biomass the deliveries of peat both by rail and road would decrease and the deliveries of biomass by road transport would increase. Biomass deliveries would comprise a maximum of 129 deliveries per day over a 16 hour period with an expected daily average of 100 deliveries per day.</p> <p>Ash would continue to be transported in closed ash wagons to the ADF. There would only be a minor impact on road traffic at one level crossing.</p> |
| Cultural Heritage | <p>There is no archaeological impact arising, either at the existing station or at the extended ADF.</p> | <p>There is no potential for an archaeological impact to occur.</p> | <p>There would be no potential archaeological impact arising.</p> | <p>There would be no potential archaeological impact arising.</p> | <p>There would be no potential archaeological impact arising.</p> |
| Landscape | <p>There would be a minor landscape impact at the station site arising from the development of biomass storage areas and the pellet storage silos and handling system.</p> <p>There would also be a minor impact at the ADF arising from the extension and continued operation of that facility.</p> | <p>The WOP station would close and be decommissioned. The landscape would be that of a decommissioned industrial site with all structure decommissioned to ground level.</p> <p>The ADF would close.</p> <p>There would be no different landscape impact other than that permitted under the current planning permission.</p> | <p>There would be no change in the landscape character at WOP station as no additional structures would be proposed and no change in operations would occur.</p> <p>There would be a minor impact at the ADF arising from the extension and continued operation of that facility.</p> | <p>There would be a minor landscape impact at the station site arising from the development of biomass storage areas and the pellet storage silos and handling system.</p> <p>There would also be a minor impact at the ADF arising from the extension and continued operation of that facility.</p> | <p>There would be a minor landscape impact at the station site arising from the development of biomass storage areas and the pellet storage silos and handling system.</p> <p>There would also be a minor impact at the ADF arising from the extension and continued operation of that facility.</p> |

Table 3-3: Assessment of Alternatives Considered (continued)

| Subject Area | Alternatives Considered | | | | |
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| | Alternatives 5, 6 & 7 - Alternate Energy related uses (Natural Gas, Solar, Energy Storage) | Alternative 8.1 – Seek an Alternative Licenced Disposal Site | Alternative 8.2 - Develop an Alternative Licenced Disposal Site | Alternative 9 – Alternative Fuel Transport Options | Alternative 10 – Alternative Design |
| <p>Population and Human Health</p> | <p>WOP station would be decommissioned and demolished. The site would be reinstated. The existing ADF would be capped and a long-term management strategy implemented. There would be no significant impacts following closure of the landfill.</p> <p>The WOP station site would be re-developed to accommodate an alternative energy use - such as natural gas fuelled power generation, solar photovoltaic generation or energy storage (batteries or flywheel). Arising from any of these scenarios there would be significant negative socio-economic impacts on the Midlands area with loss of rates to the local authority, loss of employment (direct and indirect) and loss of local spend in the Shannonbridge area. Whereas a gas fuelled station would retain some employment on the site, either a solar PV or energy storage development would create minimal employment or economic stimulation.</p> <p>The lack of a large-scale market demand for biomass as a result of the plants closure would reduce the potential for development of an indigenous biomass industry for energy purposes, delaying supply chain development which in turn would not support decarbonisation in the heating sector. The lack of a sufficiently large indigenous biomass supply chain would increase requirement for imported biomass reducing energy security.</p> <p>With the development of either solar PV or battery storage, there would be a reduction in the generation capacity of the site. The capacity for energy generation from Solar PV would be significantly less due to the limitations on the size of the site. Batteries do not generate energy – they provide storage capacity. In this scenario all generation capacity would be lost.</p> <p>Peat harvesting would cease and rehabilitation plans would be implemented as per Alternative 1, the Do Nothing Scenario”</p> | <p>Impacts associated with the station and peat harvesting operations would be as outlined for the proposed development.</p> <p>The existing landfill would be closed as per the EPA CRAMP and no potential impacts would occur. Ash would be transported to a different licensed facility for disposal.</p> <p>The benefit of using the existing ADF, which is linked to the WOP station by rail, would not be realised</p> <p>Disposal at an alternative, licenced, landfill site would likely require planning permission and/or a change in landfill operational licence from the EPA. This could result in delays leading to the closure of the WOP station with the associated significant negative socio-economic impacts.</p> <p>There would be localised negative socio-economic impacts as operations at the existing landfill cease. Economic benefits would transfer to the zone of influence associated with another licenced site.</p> | <p>Impacts associated with the station and peat harvesting operations would be as outlined for the proposed development.</p> <p>The existing landfill would be closed as per the EPA CRAMP and no potential impacts would occur.</p> <p>The benefit of using the existing ADF, which is linked to the WOP station by rail, would not be realised.</p> <p>The development of a new landfill site would require full planning permission. Unless an alternative landfill site was linked by the existing rail network either a new rail network would need to be constructed or road transportation would be required. Both of these options would have potential for impact on human health.</p> <p>Refusal or delay in planning would lead to the closure of WOP with significant negative socio economic impacts</p> | <p>Impacts associated with the station, ADF and peat harvesting would be as outlined for the proposed development with the exception of the transport of fuel element and noise associated with transport.</p> <p>The transport of biomass to the station by rail could remove a significant portion of road transport of biomass by road. There would be fewer HGVs passing through Shannonbridge and on the approach roads to the village.</p> <p>A remote delivery railhead would need to be developed to facilitate transfer of road deliveries to the rail system. This could impact on human beings living near this location with increased traffic, noise and potential air quality impact in the form of dust from site operations and transfer activities. Such a railhead would likely require planning permission leading to a delay that would impact the socio economics of the project.</p> <p>There may be some socio-economic positive impact in the form of employment at a dedicated transfer centre.</p> | <p>Alternative layouts of the WOP station site have been considered – namely the development of the former ash landfill storage area and associated development of an elevated conveyor system. The development costs for this alternative are estimated as being significantly higher than that proposed thereby increasing the commercial risk to the project. Increased project risk may give rise to negative socio-economic impacts due to the development not proceeding.</p> <p>Impacts associated with the WOP station itself, the ADF and peat harvesting operations would be as outlined for the proposed development.</p> |

| Subject Area | Alternatives Considered | | | | |
|--|--|---|--|---|---|
| | Alternatives 5, 6 & 7 - Alternate Energy related uses (Natural Gas, Solar, Energy Storage) | Alternative 8.1 – Seek an Alternative Licenced Disposal Site | Alternative 8.2 - Develop an Alternative Licenced Disposal Site | Alternative 9 – Alternative Fuel Transport Options | Alternative 10 – Alternative Design |
| Biodiversity | <p>There would be minor biodiversity gain from the closure and restoration of the WOP station site and existing ADF. The significance of this impact would depend on the footprint of alternative use developed on the site. For example, a solar facility would have a more extensive footprint that either battery storage or natural gas generation.</p> <p>There would be no thermal cooling water discharge with a minor positive impact on the aquatic ecology of the Shannon River.</p> <p>Peat harvesting would cease and rehabilitation plans would be implemented as per Alternative 1, the Do Nothing Scenario”</p> | <p>Impacts associated with the station and peat harvesting operations would be as outlined for the proposed development.</p> <p>The existing landfill would be closed as per the EPA CRAMP leading to a slight positive benefit to biodiversity at this location in the long term.</p> <p>Potential impacts on biodiversity would occur from increased transport of ash material by road to an identified licenced landfill site.</p> | <p>Impacts associated with the station and peat harvesting operations would be as outlined for the proposed development.</p> <p>Closure of the existing landfill would lead to a slight positive benefit to biodiversity at this location in the long term.</p> <p>There would be a loss of biodiversity at the footprint of any new landfill site and if rail transport were required, biodiversity would also potentially be impacted along the development of any new rail corridor.</p> | <p>Impacts associated with the station, ASDF and peat harvesting would be as outlined for the proposed development.</p> <p>The development of a new rail head with concrete delivery and transfer slabs would require the development of additional land, with a potential for some loss of biodiversity.</p> | <p>An alternative design or layout at the WOP station or ADF site could give rise to different impacts on biodiversity.</p> <p>The utilisation of the former ash landfill storage area would require excavation of that area – where an active badger sett is located. Development of this area may require displacement of that sett. This alternative would give rise to the permanent loss of a rehabilitated area.</p> <p>Impacts associated with the ADF and peat harvesting operations would be as outlined for the proposed development</p> |
| Land, Soils, Geology & Hydrogeology | <p>Potential impact to groundwater could occur during the construction phase of any type of alternative energy project.</p> | <p>There would be no additional impacts on soil, geology or hydrogeology associated with the use of an existing landfill. However, if additional land take and development to expand the landfill were required potential impacts could occur</p> <p>Impacts associated with the station would be as outlined for the proposed development. Deposition of ash into an alternative ash landfill would pose potentially different risks to the groundwater body beneath that landfill, associated with the ash metal content. The potential for, and significance of these associated impacts would be dependent on the landfill design and compliance with the Landfill Directive.</p> | <p>Additional land take and development would give rise to potential impacts on land, soil, geology and hydrogeology.</p> <p>Impacts associated with the station would be as outlined for proposed development above. The construction of a new landfill could pose greater potential impact to groundwater due to the size and scale of the required operations to construct it. This would entail ground excavation into potential groundwater aquifer strata and potential for leachate generation if not properly designed and constructed</p> | <p>Impacts associated with the station would be as outlined for the proposed development above. Potential impact to groundwater could occur during the construction and operation of the biomass transfer station.</p> | <p>An alternative design or layout at the WOP station or ADF site could give rise to different impacts on land take, soil and groundwater. The utilisation of the former ash landfill storage area would require excavation of that area including the construction of embankments and a large concrete slab storage area – which itself has the potential to impact on groundwater during the construction / excavation phase. The site would no longer be a rehabilitated site but would become an industrial biomass storage area. The underlying geology would not be significantly impacted.</p> |

| Alternatives Considered | | | | | |
|-------------------------|---|--|--|--|--|
| Subject Area | Alternatives 5, 6 & 7 - Alternate Energy related uses (Natural Gas, Solar, Energy Storage) | Alternative 8.1 – Seek an Alternative Licenced Disposal Site | Alternative 8.2 - Develop an Alternative Licenced Disposal Site | Alternative 9 – Alternative Fuel Transport Options | Alternative 10 – Alternative Design |
| Surface Water | <p>The main potential for impact on surface water would arise during the construction phase with potential for silt laden water to escape to the River Shannon. Potential impacts could also occur from increased drainage volumes and changes in site management regimes – such as the impact of additives used in cleaning solar photovoltaic panels.</p> <p>A surface water drainage system would be required for Alternatives 5 and 7 and partially for Alternative 6 similar to the WOP station.</p> | <p>Impacts associated with the station would be as outlined for the proposed development above.</p> <p>Transportation of ash by road to an alternative licenced facility would pose a potential for water quality contamination along the transport route. It could also pose a potential at the licenced landfill site due to the changed nature of landfill material (ash) to be deposited.</p> | <p>Impacts associated with the station would be as outlined for the proposed development above.</p> <p>The construction of a new landfill would pose significantly greater potential impact to surface water due to the size and scale of the required operations and associated drainage requirements.</p> | <p>Impacts associated with the station would be as outlined for the proposed development above</p> <p>The development of a rail head transfer station would likely give rise to surface water run-off from hard working areas which would need to be controlled. This could result in impact from suspended solids and equipment fuel leaks to surface water drainage in the area.</p> | <p>An alternative design or layout at the WOP station or ADF site could give rise to different impacts on surface water.</p> <p>The utilisation of the former ash landfill storage area would require excavation of that area including the construction of embankments and a large concrete slab storage area – which itself has the potential to impact on surface water during the construction / excavation phase.</p> |
| Noise | <p>There would be significant impacts associated with the construction of an extension to the natural gas network. There would be a continued and minor noise impact associated with the operation of the station. this would be similar in nature to the existing power WOP station noise.</p> <p>Where a solar PV or battery storage facility was developed on the site, following initial construction there would be no significant environmental emissions that save from occasional noise arising from infrequent access for maintenance.</p> | <p>The use of an alternative licenced landfill would lead to increased road traffic and associated noise in the general area as ash would no longer be transported by the existing rail system.</p> | <p>Noise impact would be introduced into a green field environment.</p> | <p>There would be less impact on traffic, noise associated with traffic movements would be reduced and there would be less potential impact on air quality.</p> <p>The decrease in peat usage by the station would be reflected in reduced deliveries by rail to the station with reduction in associated site noise but this would be offset by new deliveries associated with biomass by rail.</p> | <p>An alternative design or layout at the WOP station or ADF site could give rise to different impacts on noise.</p> |
| Climate and Air | <p>For any alternative energy use there would be minor emissions of greenhouse gases to air from the operation of construction equipment, materials production and supply and from routine maintenance operations.</p> <p>The operation of a natural gas fuelled generation station would be subject of a new IE Licence. All emissions for the station would be regulated by that licence. There would be continued GHG emissions from a natural gas fuelled station – albeit at a significantly lower level than present. There would be temporary impacts associated with the construction of an extension to the natural gas network, in terms of dust and noising from the construction activities and some GHG emissions from construction equipment. There would be continued and minor noise impact associated with the operation of the station.</p> | <p>Impacts associated with the station would be as outlined for the proposed development above. GHG emissions from WOP station would continue under the EU Emissions Trading Scheme.</p> <p>Transport of ash by road to an existing licenced landfill site would increase potential for fugitive dust emissions along the transport route and at the licenced landfill area. Greenhouse gas emissions would also increase from combustion of fossil fuels by transport vehicles.</p> <p>Some additional noise impact at the alternate existing landfill due to ash transport and additional landfilling operations would likely occur.</p> | <p>Impacts associated with the station would be as outlined for the proposed development above. GHG emissions from WOP station would continue under the EU Emissions Trading Scheme.</p> <p>The development of a new ash landfill site would potentially result in impacts on air quality from fugitive dust emissions during construction and operation as further cells were developed. There would also be associated greenhouse gas emission from construction equipment and in the transportation of ash to the new facility.</p> | <p>Impacts associated with the station would be as outlined for the proposed development above.</p> <p>Minor emissions of greenhouse gases to air would occur due to construction of the transfer station facilities, materials production and supply and routine maintenance operations.</p> <p>There would be some GHG savings from reduced transportation by HGV, but this would be limited to savings achieved by reducing deliveries within the final 10km to Shannonbridge. Biomass would still be delivered by road haulage to the location of the transfer station location. In addition any GHG savings from reduced road haulage would be offset to some extent by rail delivery fuel consumption.</p> | <p>Impacts associated with the station would be as outlined for the proposed development above. GHG emissions from WOP station would continue under the EU Emissions Trading Scheme.</p> <p>It is unlikely that alternative design or layout at the WOP station or ADF site would give rise to different impacts on climate and air.</p> |

| Alternatives Considered | | | | | |
|--------------------------|--|---|--|---|--|
| Subject Area | Alternatives 5, 6 & 7 - Alternate Energy related uses (Natural Gas, Solar, Energy Storage) | Alternative 8.1 – Seek an Alternative Licenced Disposal Site | Alternative 8.2 - Develop an Alternative Licenced Disposal Site | Alternative 9 – Alternative Fuel Transport Options | Alternative 10 – Alternative Design |
| | <p>The development of an alternative generating facility such as a solar PV facility, although limited in scale would displace fossil fuel energy production leading to additional carbon and other greenhouse gas savings Nationally. Development of an energy storage system such as battery or flywheel on site would also lead to reduced carbon emissions through reducing electricity losses thereby negating the need to generate additional power when required.</p> <p>Other impacts would include potential for glint and glare from a solar farm.</p> | | | | |
| Material Assets | <p>This may require alterations to the existing utilities and services at WOP station.</p> <p>For a natural gas plant a new CCGT or Gas peaking Plant would have to be constructed and a natural gas supply would be required and gas piped to such a facility from the National grid.</p> | <p>If additional ash disposal cells were required at an existing licenced landfill then this would likely require additional land take to accommodate the waste.</p> | <p>Additional land take would be required to facilitate the development of a new site.</p> <p>This would require alterations to areas outside the boundaries of the sites themselves during the construction and operational stages.</p> | <p>Additional land would be required to develop the transfer station and the development of additional utilities would be required.</p> | <p>An alternative design or layout at the WOP station or ADF site may give rise to different requirements and may impact on existing utilities.</p> |
| Transport | <p>Following construction of a solar farm or energy storage system, only minor traffic movements associated with operation and maintenance would be required. There would be an imperceptible impact on the local road network.</p> | <p>Impacts associated with the station would be as outlined for the proposed development above.</p> <p>Ash would need to be transported by road, a distance of approximately 15km to the nearest licenced landfill. There would be an impact on road traffic as the probably route would coincide with the biomass delivery routes giving rise to a cumulative moderate transport impact.</p> | <p>Impacts associated with the station would be as outlined for the proposed development above.</p> <p>Ash would need to be transported by road, to a newly develop licenced landfill. There would be an impact on road traffic.</p> | <p>Impacts associated with the station would be as outlined for the proposed development above.</p> <p>All materials for construction would be delivered by road. Upgrading or construction of an access road to the transfer facility would also be required.</p> <p>There would be an impact on road traffic at the transfer station location as biomass would have to be delivered to the site by the existing road network.</p> | <p>As an alternative layout / design would be accommodated within the station footprint or ESB landholding, no additional impact on transport is likely to occur.</p> |
| Cultural Heritage | <p>As an alternative energy use would be developed within the station footprint or ESB landholding, which has previously been surveyed no impact on cultural heritage is likely to occur.</p> <p>There would be potential for impact on cultural heritage from the construction of a gas supply main if a gas peaking plant or CCGT were developed on the site.</p> | <p>Impacts associated with the station and peat harvesting would be as outlined for the proposed development above.</p> <p>If additional land take is required at an existing landfill then potential for archaeological impact would exist.</p> | <p>Impacts associated with the station would be as outlined for the proposed development above.</p> <p>Because an additional land take is required for a new site, the potential for archaeological impact would exist.</p> | <p>Impacts associated with the station would be as outlined for the proposed development above. If additional land take is required at the transfer site then potential for archaeological impact would exist.</p> | <p>As an alternative layout / design would be accommodated within the station footprint or ESB landholding, which has previously been surveyed, no impact on cultural heritage is likely to occur.</p> |

| Alternatives Considered | | | | | |
|-------------------------|---|---|---|--|--|
| Subject Area | Alternatives 5, 6 & 7 - Alternate Energy related uses (Natural Gas, Solar, Energy Storage) | Alternative 8.1 – Seek an Alternative Licenced Disposal Site | Alternative 8.2 - Develop an Alternative Licenced Disposal Site | Alternative 9 – Alternative Fuel Transport Options | Alternative 10 – Alternative Design |
| The Landscape | An alternative energy development such as a solar photovoltaic farm would potentially have visual and glint and glare landscape impacts. An energy storage development would have significantly less impact compared to the existing WOP station. | Impacts associated with the station would be as outlined for the proposed development above. There would be a landscape impact on a different receiving environment, as per that permitted by its relevant planning permission. | Impacts associated with the station would be as outlined for the proposed development above. There would be a landscape impact on a different receiving environment – namely a greenfield site. | Impacts associated with the station would be as outlined for the proposed development above. There would be a landscape impact on a different receiving environment – namely a greenfield site, as the transfer station would have to be developed on a new site subject to planning permission. | An alternative design or layout at the WOP station or ADF site could have a different landscape impact depending on the alternative chosen. Alternative features – such as an elevated conveyor system, could have a more significant visual impact. |

3.13 Conclusion on Alternatives

In identifying the optimum solution for the future use of the existing WOP station a range of alternative options were assessed. These were compared and evaluated against the objectives of the project and how these could best be met having regard to the potential environmental impacts associated with each alternative.

The 'Do Nothing' alternative would see WOP station cease electricity generation from the end of 2020 with its subsequent decommissioning and demolition. All associated emissions as conditioned under its existing IE Licence would cease which would be beneficial to the environment, however these emissions are already controlled under the IE licence to ensure no adverse environmental impact occurs hence the environmental benefits would be limited. There would be a very significant reduction in direct greenhouse gas emissions from the generating station which is of major benefit to reducing contributions to climate change but the carbon allowances available under the EU's emission trading scheme would not be reduced by this closure and would be available to other generating plant in Europe. Any savings in GHG emissions from the plant could therefore be tempered by increases elsewhere in Europe with no resultant benefit to climate overall. Importantly therefore, there would be no positive environmental impact in terms of greenhouse gases of the do-nothing alternative as the same carbon emissions would potentially happen elsewhere in Europe. There would be local air quality positive benefits but as the air emissions would be controlled by the EPA under an IE Licence these would not have been significant in any case. There would be a significant, negative socio-economic impact on the Midlands and Eastern Region from the closure of WOP station. This impact would be immediate and would not facilitate a transition period which might allow alternative sustainable industries to be developed, the "Just Transition". There would also be no transition to a dispatchable renewable electricity generating plant with negative impacts on ESB's roadmap to a low carbon generation portfolio. There would be no contribution to achieving Ireland's EU renewable energy generation target in 2020 and 2030, which if not achieved will attract fines from the EU. This alternative does not meet any of the Project Objectives.

Alternative 2, to continue to generate electricity from peat alone would ensure continued positive impact on the socio economic well-being of the Midlands and Eastern region, but it would have significant negative impacts on the environment in terms of greenhouse gas emissions and would not achieve objectives one and three of the project. There would be no contribution to Ireland's renewable energy generation. Planning permission would also be required to continue generation of electricity solely from peat fuel post 2020 and as such an application is unlikely to be successful, it is not considered to be a viable alternative.

Alternative 3 - the alternative to transition immediately to biomass alone is not commercially viable with existing support mechanisms as discussed in **Section 3.3** above. There is insufficient indigenous biomass currently available to facilitate an immediate transition. Time would be required to allow additional sources of indigenous biomass to develop to meet the WOP needs. In the early years externally sourced sustainable biomass would be used at WOP in combination with indigenous sources. Sourcing biomass internationally that would meet ESB's sustainability requirements would take time to develop and time to build a robust supply chain. If it were feasible through increased financial support and immediate sources of economically available biomass it would have significant positive benefits in terms of an

immediate reduction in Ireland's greenhouse gas emissions and contribution to the achievement of Ireland's renewable energy generation targets. However, there would be a significant, negative socio-economic impact on the Midlands and Eastern region as peat harvesting for energy generation purposes and delivery to WOP station would no longer be required. There would be no transition period to facilitate the development of alternative sustainable employment in these areas. The alternative to transition immediately to biomass is not considered to be viable.

Alternative 4, relates to delayed transition to biomass to 2030. This alternative was originally proposed and was initially discussed with An Bord Pleanála in pre-application discussions. However, in the process of preparing the planning application a shorter transition period was identified which also reflects the Bord na Móna commitment to bring forward the end of peat for energy. This shorter transition timeline has positive consequential benefits to the environment as it will reduce CO₂ emissions from WOP faster and will result in significantly less Irish CO₂ emissions to the environment to the final transition to biomass fuel as there would be no peat burned from the end of 2027. The original alternative of transitioning to full biomass by the end of 2030 was supported by a range of policies. However, it would delay the transition to dispatchable renewable energy generation and is therefore not favourably considered.

Alternatives 5, 6 and 7 - alternative uses for the site for energy generation, such as gas fired electricity generation, solar electricity generation or energy storage have been considered. Whereas all are viable options they would not contribute significantly to achieving ESB's low carbon generation portfolio. Furthermore these alternatives would require an immediate cessation of peat harvesting activity with associated significant negative socio economic impact on the midlands and eastern region.

Alternatives 8, 9 and 10 relate to alternative design proposals. As detailed above, these add to project cost, complexity or impacts and are not considered favourably.

WOP station is a commercially operating electricity generating station which currently receives support under the existing PSO for electricity generated from indigenous peat supplied by Bord na Móna from the Midlands region. This support will cease at the end of 2019 and from that date 30% of its electricity generating capacity can be supported by a REFIT tariff which is linked directly to the biomass element co-firing with peat. There will be no subsidy for electricity generation from peat with this element competing on the open electricity market similar to any other fossil fuel plant feeding electricity into the National grid. The viability of the proposed project is such that the generating plant cannot change fuel overnight to full biomass. There are socio-economic, commercial, sustainability of fuel supply and technical reasons for the proposed transition period. A summary of the alternatives considered and their ability to meet the project objectives is set out in **Table 3-4** below.

The project as proposed will continue the use of the existing WOP station with modifications to provide for biomass storage and handling together with the required increase in the capacity of the existing ADF. This allows for the full utilisation of the existing site without significant capital investment. This utilises the existing station and ADF footprint with extension and existing ash transportation mechanism.

Under the proposed development greenhouse gas emissions, particularly carbon dioxide will continue to occur from the station but these would decrease immediately, (40%) with staged reductions to achieve a low carbon emission from the station by the end of 2027 which will be in line with National targets. In the early years the impact of the project will continue to be significant and negative but it will be of short duration with decreasing impact out to the end of 2027. WOP station will continue to trade under the European ETS scheme which is designed to ensure compliance with the EU target to reduce carbon emissions to 43% of the 2005 levels in line with Kyoto agreements by 2030. Post-2027 WOP station will generate electricity only from renewable biomass and CO₂ emissions for the biomass will be counted as zero under the EU ETS accounting rules. The station will be a dispatchable renewable energy generation station contributing significantly and positively to achieving a reduction in the greenhouse gas emission from Ireland as it will then displace other fossil fuel generation on the system. It will contribute positively to Ireland's committed target to renewable energy as required by the EU.

The proposed transitional time frame will allow adequate transition time to enable alternative industries to develop in the Midlands and Eastern region. There will continue to be a significant positive socio-economic benefit to the region, due to this managed transition from peat firing to biomass firing.

Biomass will be delivered by road transportation, which will constitute an increase over existing traffic but this would be managed through a robust traffic management plan to reduce the potential for impact to moderate. In terms of impacts on surface and groundwater the proposed development would be similar to the existing WOP station which is controlled under the existing IE Licence. No significant impact will occur. Noise impact will be similar to the existing WOP station operation. No significant impact to the Cultural Heritage of the area is predicted as the proposed development will occur within the existing footprint of the station. The existing landscape view will remain unchanged and there will be a minor landscape impact from the development of the biomass storage areas but alternative energy generation options would have similar or potentially greater landscape impacts than the proposed development.

Overall the proposed development will continue to provide a very significant socio economic benefit to the Midlands region, will see a stepwise reduction in GHG emissions in line with National and EU strategies, will have a moderate impact on traffic and transport and will have minor environmental impacts on other elements identifying it as the preferred alternative. The development will contribute significantly in a positive way to ESB's portfolio of developing low carbon generation and will contribute to National greenhouse reduction and renewable energy generation targets. It will fulfil all the project objectives and is the best alternative for the project.

Table 3-4: Summary of Project Objectives and Alternatives Assessed

| Alternatives Considered | | Objective 1 | Objective 2 | Objective 3 |
|---|--------------------------|---|---|---|
| Description | Alternative No. | To support ESB’s transition to low carbon clean energy production thereby directly supporting the de-carbonisation of the energy generation sector as a whole in-line with National and EU policy | To continue to contribute strategically to the socio-economic wellbeing of the Irish State and the Eastern and Midland Region in which West Offaly Power is situate in-line with National and EU policy | To continue to contribute towards security of clean electricity supply into the future through diversification of fuel source and utilisation of indigenous fuel supply in line with National and EU policy |
| The Project | The Proposed development | ✓ | ✓ | ✓ |
| ‘Do Nothing’. | Alternative 1 | X | X | X |
| Continued Peat Fuelled Energy Generation. | Alternative 2 | X | ✓ | X |
| Immediate switching to biomass only (if additional support mechanisms were put in place). | Alternative 3 | ✓ | X | ✓ |
| Transition to Biomass 100% in 2030 | Alternative 4 | ✓ | ✓ | ✓ |
| Alternative energy developments for the site or energy storage | Alternative 5 | X | X | ✓ |
| | Alternative 6 | ✓ | X | ✓ |
| | Alternative 7 | ✓ | X | X |

West Offaly Power Station - Transition to Biomass

| Alternatives Considered | | Objective 1 | Objective 2 | Objective 3 |
|------------------------------------|-----------------|---|---|---|
| Description | Alternative No. | To support ESB's transition to low carbon clean energy production thereby directly supporting the de-carbonisation of the energy generation sector as a whole in-line with National and EU policy | To continue to contribute strategically to the socio-economic wellbeing of the Irish State and the Eastern and Midland Region in which West Offaly Power is situate in-line with National and EU policy | To continue to contribute towards security of clean electricity supply into the future through diversification of fuel source and utilisation of indigenous fuel supply in line with National and EU policy |
| Alternative Options | Landfill | Alternative 8.1 | ✓ | ✓ |
| | | Alternative 8.2 | ✓ | ✓ |
| Alternative fuel transport options | | Alternative 9 | X | X |
| Alternative Design | | Alternative 10 | ✓ | ✓ |

3.14 References

- Bord na Móna Accelerated decarbonisation
<https://www.bordnamona.ie/company/news/articles/bord-na-mona-accelerates-decarbonisation/>
- COFORD Report – the All Ireland Roundwood Production Forecast, 2016-2035
- SEAI and Ricardo Energy & Environment, Bioenergy Supply in Ireland, 2015 – 2035, An update of potential resource quantities and costs, Ver 1.2, 10/17