

SSE Tarbert Next Generation Power Station

Environmental Impact Assessment Report (EIAR)
Volume I
Chapter 03 Need and Alternatives

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3. Need and Alternatives

3.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) sets out the need and reasonable alternatives, including the design progression that was considered during the evolution of the Proposed Development, and the design process as presented in EIAR Chapter 5: Description of the Proposed Development. This chapter also sets out the reasons why the proposed design and layout was chosen and provides details of the design evolution that has taken place in order to avoid and / or reduce adverse environmental effects. In addition, this chapter discusses the need to maintain operational efficiency and cost-effectiveness, while considering other relevant matters including planning policy and available land.

Consideration of alternatives is an important aspect of the EIA process and is necessary to evaluate the likely environmental consequences of a range of development strategies for the Proposed Development Site within the constraints imposed by environmental and planning conditions, pursuant to Schedule 6 paragraph 1(d) of the Planning and Development Regulations 2001 (as amended) of the S.I. No. 296/2018 – European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (EIA Regulations).

3.1.1 Legislative Context

Annex IV (2) of the Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment, as amended by EIA Directive 2014/52/EU (EIA Directive), requires the consideration of reasonable alternatives which are relevant to the project and taking into account the effects of the project on the environment.

It states under Article 5(1)(d) that:

‘a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment.’

The EIA Regulations require an EIAR to contain (under Schedule 6 paragraph 1(d)):

‘A description of the reasonable alternatives studied by the person or persons who prepared the EIAR, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the proposed development on the environment.’

The 2022 EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports state:

‘The objective is for the developer to present a representative range of the practicable alternatives considered. The alternatives should be described with ‘an indication of the main reasons for selecting the chosen option’. It is generally sufficient to provide a broad description of each main

alternative and the key issues associated with each, showing how environmental considerations were taken into account in deciding on the selected option. A detailed assessment (or 'mini-EIA') of each alternative is not required.'

In this context, the consideration of reasonable alternatives and design evolution has been undertaken with the aim of avoiding and/or reducing adverse environmental effects (following the mitigation hierarchy of avoid, reduce and, if possible, remedy), while maintaining operational efficiency and cost-effectiveness, and considering other relevant matters such as available land and planning policy.

This chapter considers the main alternatives for the Proposed Development and includes alternatives such as: the 'do nothing' scenario, alternative locations, alternative designs, and alternative layouts.

3.2 Need for the Proposed Development

As set out in EIAR Volume I Chapter 2, Ireland is in the process of transitioning from a centralised, fossil fuel-based electrical power generation model to a more distributed renewable-based generation system. The European Green Deal frames Europe's response to the challenges of climate change. Consistent with European (EU) policies the Irish Government has committed to achieving a 51% reduction in Ireland's overall Greenhouse Gas (GHG) emissions from 2021 to 2030 (an average 7% per annum reduction in overall GHG emissions), and to achieving net-zero emissions no later than 2050. The 2023 *Climate Action Plan*¹ features a roadmap to deliver on these climate ambitions.

Among the most important measures in the *Climate Action Plan 2023 (CAP23)*, is an increase in the use of electricity across transport and heating to reduce emissions in these sectors. The proportion of electricity generated from renewable sources will be increased to up to 80% by 2030.

Increasing future reliance on electricity to meet energy needs across transport, domestic and commercial sectors will increase the need for continued security of electricity supply. This is considered a priority at national level and within the overarching EU policy framework in which the electricity market operates. Security of electricity supply must be maintained throughout the transition to up to 80% of electricity consumption coming from renewable sources by 2030 on a pathway to net zero emissions. The *Policy Statement on Security of Electricity Supply*², published in 2021, sets out the key challenges facing the State in this regard and the policy decisions to be taken to address this.

The challenges, as set out in the Statement, include ensuring adequate electricity generation capacity, storage, grid infrastructure, interconnection and system services are put in place to meet demand (including at periods of peak demand) and ensuring diversity of fuel supply sources. The Proposed Development is designed specifically to respond quickly to shortfalls in power generation at times of high demand, utilising HVO as a sustainable alternative fuel source to gas or distillate oil, which have typically been relied upon to fuel OCGT plants in recent times.

The Policy Statement cites that most renewable energy generated by 2030 will be sourced from wind and solar. These sources of renewable energy are variable in nature and introduce intermittency to the electricity generation system.

¹ DECC (2022). *Climate Action Plan 2023 - Changing Ireland for the Better*

² DECC (2021b). *Policy Statement on Security of Electricity Supply*.

More wind, solar, storage and interconnection added to the transmission grid will mean that conventional generation plants, such as the Proposed Development, are expected to operate less. Therefore, conventional generation capacity such as the Proposed Development will spend much of its time in reserve, acting as a backup in the event it is needed such as when required to balance the system in times of high demand and low generation from wind and solar sources.

The Proposed Development will have the capacity to generate 350MW when required. It will provide quick response capabilities to EirGrid and will help to ensure that the grid network can continue to operate efficiently with the integration of more variable renewable energy sources. The Proposed Development will assist in facilitating the integration of more renewable generation into the electricity network, helping to maintain the security of supply and supporting Ireland in its transition to a low carbon economy.

The main objectives of the Proposed Development are to:

- assist the continued expansion of Ireland's renewable generation capacity.
- ensure the security of electrical power supply.
- respond quickly to shortfalls in power generation at times of high demand.
- provide support to the electricity supply system at times of peak demand and at times when other electricity generation sources are not sufficient to meet demand; and
- provide a low carbon flexible generation alternative by using HVO, a type of biofuel produced by processing waste oils to create a fossil-free alternative to gas or distillate oil in accordance with EU sustainability standards.

The Proposed Development will operate to support the electricity transmission system at times of peak demand and at times when other electricity generation sources are not sufficient to meet demand. It is likely therefore that the OCGT will remain on stand-by for the majority of the time and will only be called upon by the Transmission System Operator (TSO) as required to complement the Country's renewable power generation technology.

The need for the Proposed Development is recognised at national, regional, and local level as detailed in EIAR Chapter 2 Planning Policy, which provides a summary of relevant plans and policy documents.

3.3 Consideration of Alternatives

3.3.1 Introduction

This section provides an outline of the main alternatives considered by the Applicant in formulating the Proposed Development and sets out the key reasons for choosing the Proposed Development as outlined in this EIAR. Alternatives may be described at various levels:

1. 'Do Nothing' Scenario.
2. Alternative Locations.
3. Alternative Technical Solutions.

4. Alternative Layouts and Designs.
5. Alternative Mitigation Measures.

Pursuant to Section 3.4.1 of the EPA's guidelines, '*Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*'³, the consideration of alternatives also needs to be cognisant of the fact that 'in some instances some of the alternatives described will not be applicable - e.g., there may be no relevant 'alternative location'.

3.3.2 Do Nothing Scenario

The 'do nothing' scenario is a general description of the evolution of the key environmental factors of the Site and environs if a development / project did not proceed.

Under the 'do nothing' scenario, the Proposed Development would not be constructed, and the Applicant would be unable to generate electrical capacity from the Proposed Development, thus reducing security of supply for Ireland. As the existing Tarbert HFO Power Station will no longer operate after December 2023 and will no longer generate electricity to the grid, this would have an impact on the security of electricity supply for Ireland, increasing the potential risk of demand not being provided for.

The 'do nothing' scenario is assessed in Chapters 7 – 19 of this EIAR and provides a comparison where the environmental effects of the Proposed Development as set out in this EIAR would not occur.

3.3.3 Alternative Locations

The Proposed Development includes a responsive power generator which has the capacity to start up rapidly in order to fill temporary shortfalls between renewable power generation and demand. The reserve power generated by the Proposed Development will be critical to maintaining security of supply for the Irish Grid as it continues its transition to a renewables-based system.

The technology chosen requires suitable available land of sufficient dimensions, means to deliver fuel to the Site and a high voltage electrical grid connection.

SSE Generation Ireland Limited (SSE), the Applicant, owns, leases or manages the majority of the SSE Tarbert site. Existing connections to the electricity transmission system are available on the SSE Tarbert site immediately adjacent to (and a small section within) the Proposed Development, which is a key consideration in the Applicant selecting the SSE Tarbert site for the Proposed Development.

It should be noted that the Site of the Proposed Development, within an existing industrial setting, is on land which is zoned for Economic Development within the Tarbert-Ballylongford Landbank, which is a Strategic Development Location in the Kerry County Development Plan (CDP) 2022-2028. The specific objective is to:

“KCDP 9-25: Promote and facilitate the sustainable development of the Tarbert-Ballylongford landbank for industry, utilising the presence of deep water, existing infrastructure, natural resources, and waterside location to harness the potential of this Strategic Location. Proposals for marine related industry, general industrial development, and particularly those industries creating

³ EPA (2022). *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*.

a synergism with existing uses and contributing to the development of a strategic energy hub at this location will also be encouraged”.

Objective ‘KCDP 9-26’ of the Kerry CDP 2022-2028 confirms the objective of this economic development:

“Safeguard the role and function of the Power Plant Hub at Tarbert, including the NORA Strategic Oil Reserves Plant, as a key driver of economic growth in the Region, encouraging its sustainable growth and diversification, in accordance with regional and National Energy Objectives”.

The Proposed Development is clearly consistent with the existing use of the SSE Tarbert site, being a power station facility, and is also consistent with the strategic development objectives for the site and wider area.

Pursuant to Section 3.4.1 of the EPA’s guidelines, ‘*Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*’⁴, the consideration of alternatives is cognisant of the fact that ‘in some instances some of the alternatives described will not be applicable - e.g., there may be no relevant ‘alternative location’. The availability of sufficient, suitable land under the control of the Applicant together with proximity to existing key infrastructure (connection to electricity transmission networks, proximity to national road network), renders the proposed footprint location on the SSE Tarbert site the most appropriate for the Proposed Development.

3.3.4 Alternative Technical Solutions

The Proposed Development aims to provide security of supply to the Irish electricity network in a manner that is complementary to the growing installed levels of intermittent renewable generation. This requires high availability of rapidly dispatchable generation capacity which can only be achieved, at large scale, using thermal plant. The maximum CO₂ emissions per kWh generated limits required by the Clean Energy Package⁵, as well as the emission limits required by the IED, result in gas or HVO fired generation being the only viable option.

Gas, however, was not considered viable to progress at the SSE Tarbert site currently due to the significant additional infrastructure and space which would be required, and which is not readily available due to existing infrastructure constraints and committed projects.

The fuel choice being progressed, HVO, is a type of biofuel produced by processing waste oils to create a fossil-free alternative to distillate-oil in accordance with EU sustainability standards. HVO biofuel is fossil free as it is derived from vegetable crops which have been converted to fuel. It is not excavated from the earth like fossil fuels such as coal, natural gas, or petroleum.

The alternative plant technology to the OCGT is medium speed engines, typically in the range of 10-18 MW. OCGT technology was selected over medium speed gas engines for the following reasons:

- Medium speed engines with a similar total output would require a larger physical footprint than a comparable OCGT. As such, the use of medium speed engines would limit the electrical output available on the Site.

⁴ EPA (2022). *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*.

⁵ https://energy.ec.europa.eu/topics/energy-strategy/clean-energy-all-europeans-package_en

- Medium speed engines generally have higher unabated NO_x emissions than OCGTs, requiring additional equipment and chemicals to deliver similar levels of emissions. Due to the increased number of generators, there are also generally more stacks required; and
- Engines require more cooling infrastructure than OCGTs, thus increasing the footprint of the generators.

3.3.5 Alternative Layouts and Designs

The layout of the Proposed Development on the SSE Tarbert Site is on an existing area of hardstanding previously used as a construction compound area and laydown area for the construction of the Tarbert HFO Power Station, site storage and, currently at time of submission of this EIAR, for a construction compound area and laydown area for the construction of the Tarbert Temporary Emergency Generation (TEG) Site. It will be vacant of this temporary use by mid-2024 and will revert to an open area of hard standing with some buildings located on the northern boundary associated with the Tarbert HFO Power Station to be demolished. Prior to the construction of the Tarbert TEG project the area was hardstanding with a number of storage facilities and workshops with an internal road providing a connection route parallel of the western side of the existing Tarbert HFO Power Station, and another road which provided an internal power station access route north-south of the SSE Tarbert Site.

The specific location within the SSE Tarbert site was chosen due to its availability in having limited built infrastructure and/or plant in place and provides the required footprint area for the OCGT and its associated infrastructure. In addition, the area is generally level, requires little in the way of site preparation (i.e., no cut and fill) and is in close proximity to connect to the existing 220kV transmission substation for connection to power export. Furthermore, the existing SSE Tarbert site as a whole benefits from close proximity to the national route network for road access (via the existing road access from the N67/N69 to the east and south).

The layout configuration of the Proposed Development for which planning permission is sought has been developed taking into consideration the constraints within the SSE Tarbert site. The Proposed Development configuration has evolved to avoid the easement associated with the buried 220kV cabling. This easement runs from the north of the island along the western side of the Proposed Development and existing ESB substation, then along the southern boundary of the ESB substation before running south partially across the lagoon and the eastern section of land connecting the island to the mainland. The Proposed Development design also avoids using land associated with the TEG development and historic areas of landfill. Plates 3.1 and Plate 3.2 demonstrate the design evolution and progression.

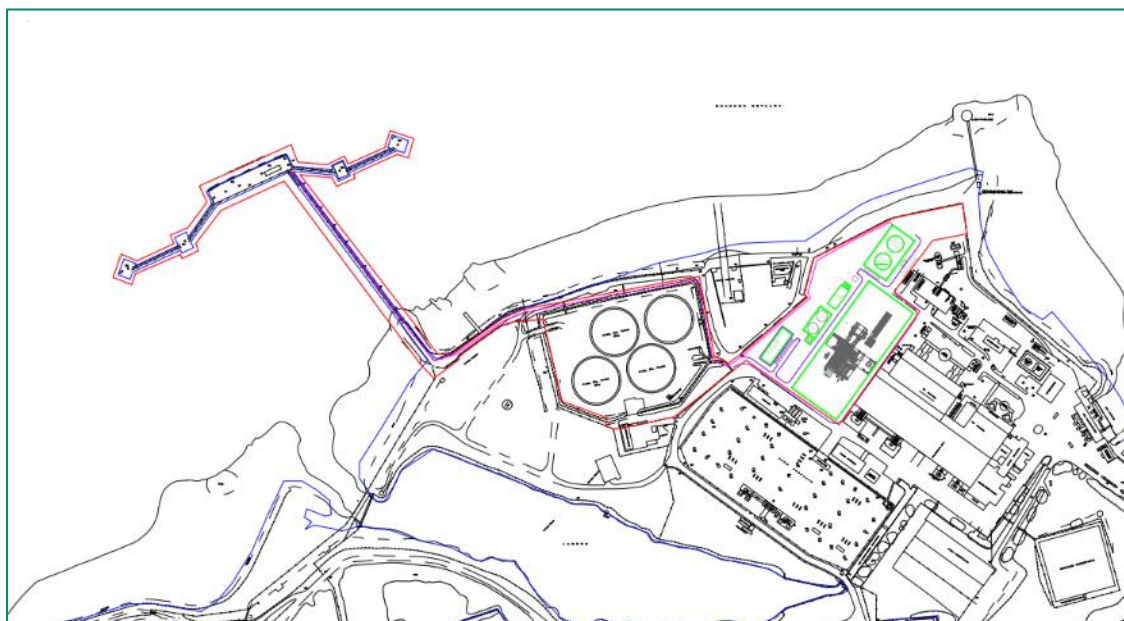


Plate 3.1: Initial Design Consent for the Proposed OCGT

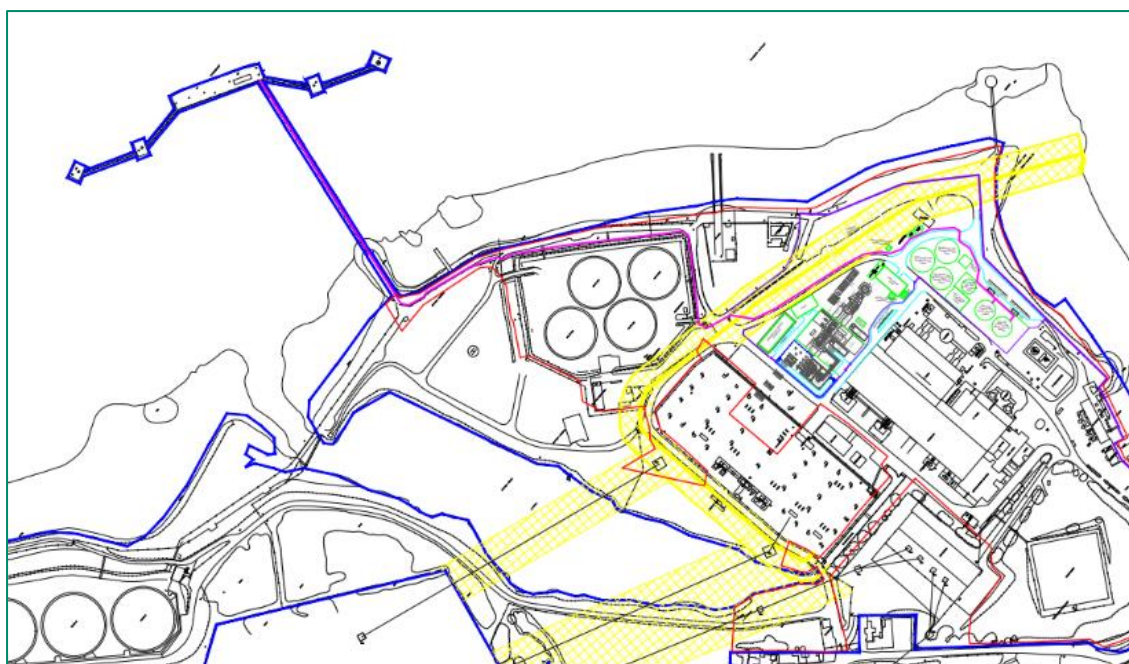


Plate 3.2: Design Progression (Proposed Development avoiding buried cable easement)

An alternative design that was considered for the Proposed Development included utilising the existing jetty on the western boundary of the SSE Tarbert site to enable fuel deliveries by sea. This design option was dismissed as the quantities of fuel required for delivery to Site will be highly variable depending on the operation of the unit, which will be dictated by grid requirements. It is likely that delivery volumes will be low and infrequent due to the 'back-up' nature of the plant, which would not be viable to source by sea. Fuel delivery by sea would only be viable for the initial fill of HVO for the Proposed Development to commence commissioning,



Plate 3.3: Design Progression (Jetty removed from Proposed Development design)

3.4 Summary and Conclusion

The 'do nothing' alternative was not considered an appropriate alternative, as there is a clear need for the Proposed Development.

The design of the Proposed Development was established taking into account the availability of suitable land within the existing SSE Tarbert Site, the most commercially and technically suitable technology to support security of supply, and site constraints including existing infrastructure and location of and proximity to the existing electrical substation.

The design evolution of the Proposed Development demonstrates that alternative fuels, technologies, and layouts were considered in the development of the design for the SSE Tarbert site, proposing and configuring technology to meet the needs of the energy market and utilising the space available.

Compared to conventional baseload power plant, Open Cycle Gas Turbine (OCGT) is considered the most appropriate technology for the Proposed Development at SSE Tarbert, due to its low footprint in relation to available area on Site, short construction time and ability to respond quickly to changes in electricity demand by mobilising and achieving full output within a short period of time. The OCGT unit will provide a very high-power density, minimising its physical scale and visual impact.

The supplied HVO will comply with the RED II (Directive (EU) 2018/2001) which provides specific sustainability criteria and the carbon intensity of individual biofuels, including an assessment of the feedstocks used and the emissions from its production, processing and supply, and will be certified accordingly by a third party. There are a number of HVO suppliers in Ireland that are certified in line with ISCC and RED II, which provide HVO for various uses. The Applicant will source its HVO from any one or more of these suppliers (refer to EIAR Volume I Chapter 5 and Chapter 17 for more information).

The Proposed Development will be developed as a commercial project for which a capacity contract has been obtained under the capacity auction process operated by the Commission for the Regulation of Utilities (CRU). This process acts as the principal method in securing new methods of electricity generation that are required to replace oil and coal fired stations, to support and facilitate the growth of renewable electricity and to ensure the security of electricity supply on the Grid.

3.5 References

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