# Connah's Quay Low Carbon Power

## Environmental Statement Volume II
## Chapter 6: Project Alternatives

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# 6. Project Alternatives

## 6.1 Overview

6.1.1 This chapter of the Environmental Statement (ES) sets out the main alternatives that have been considered in relation to the Proposed Development. It provides details of the iterative site selection and design evolution process for the Proposed Development.

6.1.2 The main focus of this chapter is to provide details of:

- alternative technologies considered by Uniper UK Limited (the Applicant);
- do nothing and do minimum scenarios;
- key criteria in site selection for the Proposed Development;
- alternative locations considered within the existing Connah's Quay Power Station site;
- alternative arrangement and design considered for the Connah's Quay Low Carbon Power (CQLCP) Abated Generation Station; and
- changes made to the design of the Proposed Development following consultation.

6.1.3 The following figures in **Volume III** of the **Environment Statement** (**EN010166/APP/6.4**) support this chapter:

- **Figure 6-1: Location of key connection infrastructure**;
- **Figure 6-2: Location of alternative locations within the Connah's Quay Site**;
- **Figure 6-3: Proposals at statutory consultation (October 2024)**;
- **Figure 6-4: Indicative Construction Laydown Areas at Statutory Consultation (October 2024)**;
- **Figure 6-5: Reduction from the Initiative Site Boundary at PEIR to the Order limits**; and
- **Figure 6-6: Indicative Location of Design Changes**.

6.1.4 No appendices support this chapter.

6.1.5 The consideration of alternatives sites to mitigate for the loss of land functionally linked[1] to the Dee Estuary Special Protection Area (SPA) / Ramsar is detailed within the **Curlew Mitigation Strategy** (**EN010166/APP/6.13**) and is not discussed within this chapter.

[1] Functionally Linked Land (FLL) is a term often used to describe areas of land or sea occurring outside a designated site which is considered to be critical to, or necessary for, the ecological or behavioural functions in a relevant season of a qualifying feature for which a Special Areas of Conservation (SAC), SPA or Ramsar site has been designated. These habitats are frequently used by qualifying species and supports the functionality and integrity of the designated sites for these features.

# 6.2 Legislative and Policy Considerations

## Legislation

6.2.1 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) (Ref 6-1) specify that an ES should contain 'a *description of the reasonable alternatives studied by the applicant, 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 development on the environment'* (Regulation 14(2)(d)). This chapter recognises and fulfils this requirement in respect of the Proposed Development.

## National Policy Statements

6.2.2 The following energy National Policy Statements (NPS) are relevant to the Proposed Development and detailed below:

- Overarching NPS for Energy (NPS EN-1) (Ref 6-2);
- NPS for Natural Gas Electricity Generating Infrastructure (NPS EN-2) (Ref 6-3);
- NPS for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (NPS EN-4) (Ref 6-4); and
- NPS for Electricity Networks Infrastructure (NPS EN-5) (Ref 6-5).

6.2.3 NPS EN-1 paragraphs 4.3.9 and 4.3.15 to 4.3.17 state that '4.3.9...*This NPS does not contain any general requirement to consider alternatives or to establish whether the proposed project represents the best option from a policy perspective'. '4.3.15 Applicants are obliged to include in their ES, information about the reasonable alternatives they have studied. This should include an indication of the main reasons for the applicant's choice, taking into account the environmental, social and economic effects and including, where relevant, technical and commercial feasibility.' '4.3.16 In some circumstances, the NPSs may impose a policy requirement to consider alternatives.' '4.3.17 Where there is a policy or legal requirement to consider alternatives, the applicant should describe the alternatives considered in compliance with these requirements.'*

6.2.4 Taken together with NPS EN-1, NPS EN-2 provides the primary basis for decisions on applications for electricity generating stations, including natural gas electricity generating infrastructure (such as the Proposed Development). Section 2.2 of NPS EN-2 outlines the factors influencing site selection for natural gas electricity generating infrastructure. These include: climate change adaptation and resilience (given the typical coastal and estuarine locations for sites, often with increased flood risk); land use and size of site; transport infrastructure for the delivery and removal of construction materials, fuel, waste and equipment; water resources, for example, some generating stations have very high water demands for cooling; electrical grid connection; and impacts to the environment, people and other receptors. However, in outlining such factors, paragraph 2.2.6 states that *'It is for applicants to decide what applications to bring forward*

*and the government does not seek to direct applicants to particular sites for natural gas electricity generating stations'*.

## 6.3 Consultation Consideration

6.3.1 Extensive consultation and engagement was undertaken by the Applicant during the design evolution process for the Proposed Development, specifically:

- non-statutory consultation held from 26 February to 25 March 2024;
- statutory consultation held from 8 October to 19 November 2024;
- non-statutory targeted consultation held from 8 May to 6 June 2025; and
- ongoing engagement throughout.

6.3.2 In response to this consultation and engagement, there were a number of technologies suggested by consultees as potential alternative means of generating power. These included nuclear power stations (such as small modular reactors (SMR)), hydrogen firing, tidal barrage schemes, solar farms and wind farms.

6.3.3 Whilst all of these technologies can, or have the potential to, play an important role in the decarbonisation of electricity generation, they have not been considered further as part of the Proposed Development, for the reasons below.

6.3.4 Nuclear (including SMR):

- long development lead time means it would be impossible to contribute to Clean Power 2030 goals;
- the technology may not allow the flexibility required to support intermittent renewables;
- it does not make the best use of the site attributes at Connah's Quay (connections to natural gas and Carbon Dioxide ($CO_2$) transport infrastructure in particular); and
- the technology Readiness Level does not currently allow commercial deployment (for SMR).

6.3.5 Hydrogen firing:

- currently there is no large supply of low carbon hydrogen available to fuel a power plant at Connah's Quay;
- this approach is not technically mature on large utility scale power plant; and
- there is currently no business model to support the use of hydrogen for power.

6.3.6 Renewables (tidal, solar, wind):

- the technology does not offer the required flexibility;

- it does not make the best use of the site attributes at Connah's Quay (connections to natural gas and $CO_2$ transport infrastructure in particular, but also cooling water systems); and
- it does not maximise generation from the land area at Connah's Quay.

## 6.4 Project Objectives

6.4.1 The Applicant is a UK-based company, wholly owned by Uniper SE (Uniper) through Uniper Holding GmbH. The intention of Uniper is to support the energy transition by developing low carbon, flexible, generation options in line with government policy. Uniper is developing a range of projects to support the energy transition including renewable projects and flexible gas fired plant. There is a clear and recognised need for large generating capacities of power plant of all types of low carbon technology, to be brought forward.

6.4.2 In selecting the Proposed Development, the Applicant had regard to the following Project Objectives:

- land available for the power plant to be built on, which:
  - must include land for the physical assets of the plant itself, plus laydown and maintenance areas to facilitate the construction and operation of the facility; and
  - ideally should entail the least use of powers such as compulsory purchase rights to obtain the required land areas.
- connections for the power plant, including:
  - grid connections for export of the generated electricity and allowing sufficient import to allow for house loads (pumps, fans, building services) when the power plant is not operating. Ideally, this should require the least amount of additional construction of electricity transmission infrastructure due to the additional cost and timelines associated with such development;
  - natural gas, for firing the gas turbines at the power plant. Similarly to electricity connections, this should require the least amount of additional construction of gas transmission infrastructure due to the additional cost and timelines of such builds;
  - water connection, for processing water supplies, and also for buildings such as offices and changing facilities. Plentiful supplies of cooling water to provide efficient cooling of the power cycle and associated balance of plant (water can be abstracted and returned to the water body);
  - for power plant utilising carbon capture, convenient connection to $CO_2$ transport infrastructure is required. It must be recognised that this is a nascent industry in the UK, albeit one supported by Government, and therefore opportunities for connection to $CO_2$ infrastructure are extremely limited at this time. Being situated near other early adopters would be beneficial to minimise connection costs and bringing carbon capture, transport and storage networks on stream; and

  - in all cases, where these services are not nearby, then land may need to be acquired through compulsory purchase to achieve connections. In many cases sites may simply not be viable at all, where all the connection requirements above cannot be met.

- staffing:
  - trained and competent personnel are required to build, operate and maintain the facility.
- speed of deployment:
  - given the pressing need for a low carbon power plant to be connected to the grid to achieve the goals of Clean Power 2030, sites where the above requirements are met would naturally be favoured for such developments and should be accelerated in their deployment.
- flexible Generation:
  - a further benefit that would ideally be demonstrated is that new or replacement flexible generation capacity can be brought on stream without requiring existing generation capacity to be removed from the system substantially before the new capacity is available.

6.4.3 The Applicant's strategy is to secure a reliable energy supply whilst accelerating the energy transition.

6.4.4 The Connah's Quay site has many advantages, including benefiting from existing strategic infrastructure connections such as cooling water, gas and power grid connections. It can also connect into nearby $CO_2$ transport and storage infrastructure as part of the CCS Cluster. The Applicant is seeking to maximise the use of these connections and is bringing forward the Proposed Development as a low carbon, dispatchable power project that can support the deployment of intermittent renewable generation types into the national grid. This type of project makes best use of the available attributes of the Connah's Quay site.

6.4.5 There has been a power station on the Connah's Quay site for over seventy years, meaning essential energy infrastructure, and people experience is already in place. Ongoing opportunities for staff at site, such as are offered by the Proposed Development, are important beyond the life of the existing generation assets, safeguarding high value roles in the region.

6.4.6 In order to maintain continuity of generation, one further Project Objective of the Proposed Development is to allow the new units to be built and the existing units to be phased out in parallel. This avoids a period of years where there is no generation at the Connah's Quay site, and dispatchable power lost from the national grid, if demolition of the existing units had to be completed before construction of the new units could start.

6.4.7 Overall, the Proposed Development would allow evolution of the Connah's Quay site as an example of how the energy industry is adapting to the challenge provided by climate change, whilst maintaining security of supply through this transition, and maintaining opportunities for the Applicant's workforce and the wider community. The Proposed Development therefore

fulfils the Project Objectives. Alternatives that do not fulfil the Project Objectives have been ruled out.

## 6.5 Alternative Technologies

6.5.1 The UK Government is currently developing its policy and investment framework to support low carbon technologies. As referenced in the Environmental Impact Assessment (EIA) Scoping Report (**Appendix 1-A: Scoping Report** (**EN010166/APP/6.4**)), the Applicant undertook a strategic screening review of all possible technology options which could provide the generation of low carbon power within the timeframe under consideration.

6.5.2 The Applicant considered:

- technical feasibility of available infrastructure at the existing Connah's Quay Power Station site (including maximising use of grid connection capacity, gas connection capacity and presence of existing water connections);
- technical and financial viability of technology options;
- sequencing with the HyNet Carbon Capture Underground Storage Cluster;
- emerging government business models to incentivise energy and carbon capture and storage (CCS) / Carbon Capture Utilisation and Storage (CCUS) development; and
- potential for the Proposed Development to be operational by 2030.

6.5.3 A Combined Cycle Gas Turbine (CCGT) generating station suitable for generating dispatchable low carbon electricity enabled with a post-combustion Carbon Capture Plant (CCP) was selected as the preferred basis of design by the Applicant for Pre-Front-End Engineering Design (FEED) following completion of the techno-economic assessment. This position is supported by paragraph 3.3.17 of NPS EN-1 which notes the importance of quick start peaking capacity, which the Proposed Development would provide.

6.5.4 Alternative power generation cycles using carbon capture were investigated, but were not considered technically mature enough to allow commercial deployment in the timeline required for 2030 operation (and therefore maximising the opportunity for the project to deliver against national energy policy goals around dispatchable, low carbon power).

6.5.5 Hydrogen fired power generation technology, whilst having the potential to deliver against these same policy goals, is not technically mature on large utility scale power plant and is also not currently adequately supported through funding schemes. Therefore, that technology also cannot currently be considered for commercial deployment in the timeline required for 2030 operation.

# 6.6 Do Nothing and Do Minimum

## Do Nothing

6.6.1 The 'Do Nothing' scenario would entail the Proposed Development not being undertaken and would result in the loss of generating capacity after the closure of the existing Connah's Quay Power Station. NPS EN-1 paragraph 3.3.12 notes the importance of large-scale electricity infrastructure in meeting the UK's energy needs.

6.6.2 The environmental and technical aspects of this option were considered, and the findings summarised below in **Table 6-1**.

**Table 6-1: Analysis of the Do Nothing Scenario**

| Criteria | Description |
|---|---|
| Land availability | Without the Proposed Development (Do Nothing) it is assumed that the land within the Order limits would remain under its current use. Within the Main Development Area, this would include pastoral farming and areas of hardstanding for former supporting infrastructure of the existing Connah's Quay Power Station and existing operational laydown, contractors' facilities, and stores for the existing Connah's Quay Power Station. |
| Technical viability | Without the Proposed Development (Do Nothing), the United Kingdom would not be able to benefit from the up to 1,380 MWe of electrical generation that the Proposed Development would have generated. |
| Financial viability | If the Proposed Development is not taken forward then the associated costs would not be incurred but neither would the national benefits be realised. |
| Environmental constraints | The decommissioning of the existing Connah's Quay Power Station will be required in the future with or without the Proposed Development. On this basis this is not considered to be a determining factor for the Do Nothing Scenario.<br><br>Should the reduction in capacity be addressed by the construction of an equivalent generating station to the Proposed Development, there is potential that this equivalent generating station would be constructed and operated in a less-suitable area for such development and with a greater risk of potential effects for receptors sensitive to air quality, noise, human health, ecology, water quality, and other impacts outside of the Connah's Quay area. |

6.6.3 It is considered that a 'Do Nothing' scenario is not a reasonable alternative given the established national need for new low carbon energy infrastructure and the status of the Proposed Development as a 'Critical National Priority (CNP), which is set out in **Chapter 7: Planning Policy and Need** (**EN010166/APP/6.2.7**).

## Do Minimum

6.6.4 The Applicant has considered a 'Do Minimum' scenario, which would comprise the installation of CCS infrastructure to the existing Connah's Quay Power Station instead of carrying out the Proposed Development. This option would require the upgrade and replacement of internal components, plant and other equipment alongside the construction of new infrastructure required to enable the plant to run in an abated mode, including new stacks.

6.6.5 This is considered as a variable option on the basis that works for the installation of CCS infrastructure would be required regardless of whether a new power station is construction or modifications are made to the existing Connah's Quay Power Station.

6.6.6 The analysis of this option is considered and the findings noted below in **Table 6-2**.

**Table 6-2: Analysis of the Do Minimum Scenario**

| Criteria | Description |
|---|---|
| Land availability | The existing Connah's Quay Power Station is located within the Applicant's existing land holding.<br><br>It is likely that the CCS infrastructure could be in place and operational by 2030 in line with the Project Objectives. |
| Technical viability | The existing Connah's Quay Power Station is approaching the end of its design life and large amounts of the plant and equipment would need to be replaced. Additionally, major works to the structures of the existing Connah's Quay Power Station would be required which may not be technically feasible.<br><br>It was considered that wholescale changes to the existing operational layout would be required and could be similar to the construction of a new power station on the site of the existing Connah's Quay Power Station. |
| Financial Viability | This scenario would require the existing Connah's Quay Power Station to cease generation for the duration of the retrofitting.<br><br>It is considered that to undertake the required significant structural works would be prohibitively expensive to achieve the required operational lifespan (beyond 2060). It is also considered uneconomic to undertake the retrofit without the required significant structural works as this would render the upgrade/replacement of internal components, plant and other equipment unusable at the existing |

| Criteria | Description |
|---|---|
| | Connah's Quay Power Station at the end of the current designed lifespan. |
| Environmental Constraints | The works required to install the CCS infrastructure may be shorter in duration than construction of a new power station (though this may be complicated by the existing layout and scale of works required to adapt the existing Connah's Quay Power Station) and would require less land take. The associated construction effects would therefore likely be reduced when compared to the construction of a new power station.<br><br>However, with regard to operational environmental effects, the existing Connah's Quay Power Station is likely to be less efficient than a newbuild generating station both in terms of electrical generation, due to the CCS infrastructure requiring power generated on-site in a use not anticipated for in current output figures (without upgrades to existing CCGT), and rate of $CO_2$ generation. While these emissions would be largely abated to long-term storage this would exhaust the availability of storage more quickly than a newbuild generating station.<br><br>The existing Connah's Quay Power Station also offers worse efficiency of electrical generation relative to natural gas consumption in comparison to newbuild generating station proposals with increased likelihood of effects to receptors sensitive to air quality, noise, human health, ecology, and water quality impacts associated with the required extraction, refining, and transport of additional natural gas, relative to the Proposed Development, and the increase of emissions other than those abated by CCP (e.g. $NO_x$, N-Amines), during its operation. |

6.6.7 Having regard to the above analysis, this option was discounted on the basis it does not align with the Project Objectives, in particular due to the potential reduced output capacity and under-utilisation of existing connections associated with this option. However, this option resulted in the identification of the 'replacement in situ' alternative, which was considered further in the next stages of the design evolution process (Section 6.8).

## Conclusion

6.6.8 The Applicant has considered both the Do Nothing and Do Minimum Scenarios and considered that they do not present a reasonable alternative to the Proposed Development.

# 6.7 Site Selection

6.7.1 In determining the location for the Proposed Development, the Applicant had regard to the Project Objectives as explained above. Set out below are key requirements for the site selection:

- land ownership;
- point of Grid Connection; and
- connection to the HyNet $CO_2$ Pipeline.

## Land Ownership

6.7.2 In the UK, the Applicant owns and operates a flexible generation portfolio of power stations, a fast-cycle gas storage facility and two high pressure gas pipelines, from Theddlethorpe to Killingholme and from Blyborough to Cottam. The Applicant also has significant long-term regasification capacity at the Grain LNG terminal in Kent, to convert liquified natural gas (LNG) back to natural gas. The Connah's Quay site (the Main Development Area) in Flintshire is one of these sites.

6.7.3 The Connah's Quay location (the Main Development Area and C&IEA) is wholly owned by the Applicant, which minimises the need to acquire, either voluntarily or through the exercise of compulsory acquisition powers, land or rights in land for the Proposed Development. The **Statement of Reasons** (**EN010166/APP/4.3**) explains the Applicant's approach to acquisition. Although some compulsory acquisition powers are still required for the Proposed Development, the Applicant has sought to minimise this where possible through careful site selection and having regard to land ownership and availability.

## Point of Grid Connection

6.7.4 Grid connection availability is a recognised constraint for the delivery of low carbon power projects. The ability of the Proposed Development to reuse existing connections as they become available is an important reason for selecting the Connah's Quay site for a new power generation project. At the Connah's Quay site, the Main Development Area has the advantage of connections to the high voltage electricity transmission network in close proximity and has grid connection agreements in place with National Grid Electricity Transmission Network serving the current units, as well as a Network Exit Agreement (NEXA) for natural gas supply to an existing Above Ground Installation (AGI).

## Connection to the Hynet $CO_2$ Pipeline

6.7.5 The Connah's Quay site (Main Development Area) is located in close proximity to the Hynet $CO_2$ Pipeline and the majority of the physical infrastructure forming any potential connection to this for $CO_2$ export to storage is in situ via the existing former natural gas import pipeline (the Repurposed $CO_2$ Connection). The completion of this connection could then be formed via the installation of a relatively short (approximately 422 m within overall approximately 27 km pipeline route to Point of Ayr) additional pipeline (the Proposed $CO_2$ Connection) between the endpoint of this

existing pipeline and Liverpool Bay CCS Limited's Flint AGI and the installation of a new AGI for $CO_2$ processing, monitoring, metering, and export within the Main Development Area (the Proposed $CO_2$ AGI).

6.7.6 This result of this is that limited additional works are required outside the Main Development Area to connect the CCP as part of the Proposed Development to the Hynet $CO_2$ Pipeline. Therefore, this serves as another important reason for selecting the Connah's Quay site for a new power generation project intending to incorporate carbon capture.

# 6.8 Alternative Locations to site the proposed CQLCP Abated Generating Station within the selected Connah's Quay Site

## Overview

6.8.1 This section presents a summary of the main alternative locations considered within the Applicant's land holding at Connah's Quay for the siting of the trains of proposed Low Carbon Power Abated Generation Station. It outlines the locations considered and summarises the analysis of each option.

## Description of alternative site locations

6.8.2 The following alternative site locations for the proposed Low Carbon Power Abated Generating Station itself within the Applicant's land holding at Connah's Quay were considered:

- replacement in situ;
- 'North' site; and
- 'South' site.

6.8.3 These locations are shown on **Figure 6-2: Location of alternative locations within the Connah's Quay Site** (**EN010166/APP/6.3**).

### *Replacement in situ*

6.8.4 The 'replacement in situ' option consists of the direct replacement of the existing Connah's Quay Power Station. This is closely aligned to the Do Minimum scenario with regard to location, extents, and indicative development. However, instead of installing CCS infrastructure to the existing Connah's Quay Power Station (Do Minimum scenario), the replacement in situ option would involve partial or full demolition of the existing Connah's Quay Power Station and then the construction of the proposed Low Carbon Power Abated Generating Station on that land.

### *'North' site*

6.8.5 The 'North' site is the largest of the three areas considered and comprises land to the north of the existing Connah's Quay Power Station. It was noted in initial studies to comprise three individual land parcels, totaling 24 hectares (ha) in size.

6.8.6 Areas of this site are physically constrained by overhead power cables that run across the west of the 'North' site as well as a series of intake and outfall pipes associated with the existing Connah's Quay Power Station. One easement is also located within this site associated with the gas pipeline from Liverpool Bay to the existing Connah's Quay Power Station AGI.

### *'South' site*

6.8.7 The 'South' site is the smallest of the three areas considered and comprises land associated with the previous Connah's Quay coal fired power station. It was noted in initial studies to comprise two individual land parcels, totaling 9.5 ha in size.

6.8.8 There are a number of physical constraints associated with the 'South' site, including both 400 kilovolt (kV) and 132 kV overhead lines along the north-eastern boundary. The 'South' site is also located in proximity to the North Wales Main Line railway and other electrical transmission infrastructure, including buried high voltage cables. These constraints were identified to include prohibition of changing ground levels.

## Analysis

6.8.9 Each of these sub-site alternative locations has been considered by the Applicant with regard to the following criteria:

- land availability:
  - criteria 1: timescales associated with available land;
  - criteria 2: area available for permanent development;
- technical feasibility:
  - criteria 1: ease of construction, operation and decommissioning;
  - criteria 2: suitability with regard to security of supply;
- financial viability:
  - criteria 1: wider socio-economic implications of the chosen site;
  - criteria 2: initial financial outlay and future commercial viability; and
- environmental constraints:
  - criteria 1: relative likely significant effects associated with construction and decommissioning; and criteria 2: relative likely significant effects associated with operation.

### *Land availability*

6.8.10 The 'North' site is the largest site and was noted to have the least physical or practical constraints to development, noting that replacement in situ would require the demolition of the existing Connah's Quay Power Station before land would be available for development to commence. It is considered that the 'South' site may not be able to accommodate a generating station of the capacity required for the Proposed Development.

### *Technical feasibility*

6.8.11 Both the 'North' and 'South' sites and replacement in situ are located within proximity of a connection to the Town's water supply, could utilise existing cooling water infrastructure and connections to gas supply and the electricity distribution system.

### *Financial viability*

6.8.12 The 'replacement in situ' option is not considered to be commercially viable as it would not be possible for the new build generating station to be operational in time to secure the funding scheme required for the construction and operation of the Proposed Development. Similarly, the 'South' site may have issues of commercial viability as it may not be possible to construct a generating station within the 'South' site that would fully utilise the export capacity for generated power of the existing connections. It is expected that the 'North' site would allow for the construction of a generating station of a size capable of generating sufficient power to fully utilise the existing connections in time to secure the required funding scheme for the construction and operation of the Proposed Development.

### *Environmental constraints*

6.8.13 Both the 'North' and 'South' sites and the extent of replacement in situ were noted to consist of made ground overlying superficial deposits and would require land raising to address potential issues associated with flood risk.

6.8.14 The 'South' site was identified to be less favourable from an operational noise perspective noting its proximity to residential properties on the B5129 Kelsterton Road.

6.8.15 Given the proximity of both sites to the Dee Estuary and residential populations in Connah's Quay, both the 'North' and 'South' sites and replacement in situ were all considered to be comparable when considering construction and operational air quality emissions.

6.8.16 Ecological surveys were undertaken for both the 'North' and 'South' sites and the extent of replacement in situ and it was noted that all had the potential to support qualifying features of the adjacent statutory ecological designations.

### *Comparison of options*

6.8.17 **Table 6-3** presents an analysis of each of location against the criteria provided above.

## Table 6-3: Analysis of alternative site locations

| | Replacement in situ | North Site | South Site |
|---|---|---|---|
| **Land availability** | | | |
| Criteria 1 | This land is available for development but would require extensive demolition before construction could commence. | This land is readily available for development. | This land is readily available for development. |
| Criteria 2 | Area available will be suitable for a generating station with capacity comparable to the Proposed Development. | Area available will be suitable for a generating station with capacity comparable to the Proposed Development. | Area available is unlikely to be suitable for a generating station with capacity comparable to the Proposed Development. |
| **Technical feasibility** | | | |
| Criteria 1 | Construction and operation of this option is technically feasible but is likely to require a longer construction programme than the other two options. | Construction and operation of this option is feasible but would require additional utility and infrastructure connections. | Construction and operation of this option is feasible but would require additional utility and infrastructure connections and is likely to require a smaller capacity design. |
| Criteria 2 | Decommissioning and demolition of the existing power station followed by a rebuild would lead to several years without generation on site, with implications for security of supply during construction. | No implications. | As the newbuild generating station would likely have to be of smaller capacity than the Proposed Development, there would be implications for the security of supply during operation. |
| **Financial viability** | | | |
| Criteria 1 | Decommissioning and demolition of the existing power | No implications. | As the newbuild generating station would likely have to be of smaller |

| | Replacement in situ | North Site | South Site |
|---|---|---|---|
| | station followed by a rebuild would lead to several years without permanent operational roles on site. | | capacity than the Proposed Development, there is potential that fewer jobs during construction and permanent roles during operation would be created or required. |
| Criteria 2 | Option is not deliverable within timelines associated with Track-1 (Ref 6-6) expansion that is necessary for the business model of the Applicant. Therefore, this option is not commercially viable. | Option is commercially viable with regard to the funding programme. However, there would be additional costs associated with the creation of new utility and infrastructure connections. | Option is commercially viable with regard to the funding programme and may present a reduced capital cost due to the likely smaller design. However, there would be additional costs associated with the creation of new utility and infrastructure connections (both in terms of distance to connections and fewer economies of scale being available due to the likely reduced generating capacity). |
| **Environmental constraints** | | | |
| Criteria 1 | Option minimises land take (further than the Proposed Development) or use of greenfield land for development by using brownfield land which would have ceased commercial operation (the existing asset will have ceased generation at that point). | Relative to both other options, option requires the largest volume of greenfield land and therefore the greatest potential for likely significant effects, in addition to moving permanent development closer to the Dee Estuary designations where no development exists or was previously. | Option minimises land take (further than the Proposed Development) (given that less suitable land is available) or use of greenfield land for development by using brownfield land which would have ceased commercial operation. However, this option would cause the permanent loss |

| | Replacement in situ | North Site | South Site |
|---|---|---|---|
| | | | of open mosaic habitat within the South site. |
| Criteria 2 | Option would retain the existing impacts to receptors in the vicinity of the existing Connah's Quay Power Station, albeit with an expected slight reduction in some aspects due to the greater efficiency of the newbuild generating station relative to existing and an expected increase with regard to landscape and visual impacts due to increased stack heights. | Option would locate the newbuild generating station further from the human receptors of Connah's Quay (and surrounding settlements), however it would be more proximate to the Dee Estuary designations and therefore pose an increased risk of likely significant effects to sensitive ecological and habitat receptors. | Option would locate the newbuild generating station closer to both the human receptors of Connah's Quay and the ecological and habitat receptors of the Dee Estuary designations (in an area where development of a similar nature existed previously). As the generating capacity is likely to be smaller than for other operations, it is likely that additional generation (possibly unabated natural gas combustion) would be required at another location with the potential for significant effects to receptors sensitive to air quality, human health, noise, ecology, and water quality impacts. |

### Conclusions

6.8.18 The North site was selected as the preferred location for the proposed Low Carbon Power Abated Generation Station on the basis:

- it allows project construction and delivery such that dispatchable, low carbon, power can be delivered from 2030, securing commercial viability;
- it maximises potential to fulfill policy need for dispatchable, low carbon power;
- it reduces proximity of the Proposed Development to receptors in Connah's Quay;
- it allows continued generation from the existing Connah's Quay Power Station during the construction period of the Proposed Development;
- the land area offers the potential for the Proposed Development to maximise the use of the connection to the national grid;
- it offers good proximity to existing natural gas connection;
- it offers good proximity to the proposed $CO_2$ export corridor;
- it offers good proximity to cooling water infrastructure; and
- it optimises the provision of laydown and construction areas.

6.8.19 It was subsequently determined that the 'South' site would be required to facilitate the construction of the proposed CQLCP Abated Generation Station and as such the Order limits comprise the 'North' and 'South' sites, as well as areas around the existing Connah's Quay Power Station. The 'North' site and extent of replacement in situ combined are referred to in the ES as the Main Development Area ('North' site is the north-west of the Main Development Area; the extent of replacement in situ is the south-east of the Main Development Area). The 'South' site is referred to within the ES as the Construction and Indicative Enchantment Area (C&IEA).

## 6.9 Alternative Design and Design Evolution

6.9.1 This section presents a summary of the design evolution of the Proposed Development throughout its design stages through to the submission of the Application.

### Pre-Scoping and Non-statutory Consultation

6.9.2 Prior to submitting a scoping request and carrying out the non-statutory consultation, the Applicant completed an optioneering exercise to consider the potential layout of the CQLCP Abated Generating Station as well as technical studies on the viability of net electrical output capacity. The outcomes of these studies are summarised within this section.

#### *Electrical output capacity*

6.9.3 The existing Grid connection has a high strategic value and maximising the use of this connection to provide dispatchable, low carbon, power is seen as a key benefit of the Proposed Development. Therefore, the decision was made to select a configuration, expected to be developed in two phases of

up to a maximum of 1,380 MWe (consistent with the size of the existing connection).

### *CQLCP Abated Generating Station*

6.9.4 Following a decision on electrical output capacity, the Applicant considered alternative layouts for the CCGT generating plants. On the basis that the Proposed Development would comprise two CCGT plants it was concluded that the linear design was the preferred option on the following grounds:

- shared utilities and services would be close together;
- plant efficiency; and
- visual impact as tall elements would be located close to each other within the center of the site.

## Scoping and Non-Statutory Consultation

### *CQLCP Abated Generating Station*

6.9.5 An EIA Scoping Report (**Appendix 1-A: Scoping Report**) (**EN010166/APP/6.4**) was submitted to the Planning Inspectorate in February 2024 and non-statutory consultation on the project was carried out in February to March 2024. Within the EIA Scoping Report and the materials for the non-statutory consultation, the Proposed Development was presented to include up to two CCGT generating plants that would either be constructed simultaneous or would be phased. At this stage of design, the CQLCP Abated Generating Station was noted to have a net electrical output capacity of up to a likely maximum of 1,380 MWe and an operational design life of approximately 30 years.

6.9.6 The CCGTs were noted to include emission stacks associated with abated and unabated generation modes. The HRSG (unabated) stacks were noted to be approximately 56 m above ground level (AGL), with the absorber (abated) stacks noted at 105 m AGL. It was also identified that each CCGT generating plant could require either one or two absorber stacks depending on the FEED contractors' design and technological response to (then-)future tender.

6.9.7 An indicative arrangement for the Proposed Development was not presented within the EIA Scoping Report (**Appendix 1-A: Scoping Report** (**EN010166/APP/6.4**)). A very high-level outline design showing the approximate boundaries of Train 1, Train 2, construction laydown, and the electrical connection, all within the Main Development Area, was presented as part of the brochure for non-statutory consultation.

6.9.8 Indicative operational staffing was identified to be 66 staff to cover a 24-hour period.

6.9.9 Reference was made to planned outages that would occur once operational and would require an additional 300 workers on site for a period of 60 days or two months. It was noted that these would be expected to arise once every four years of operation.

### *Construction Activities and Programme*

6.9.10 At the non-statutory consultation stage, the following construction activities were noted:

- an existing gas treatment plant and contractor's building located to the north of the existing Connah's Quay Power Station would be required to be demolished;
- the demolition of the existing Connah's Quay Power Station would not needed to facilitate the Proposed Development; and
- targeted ground raising would be required to increase ground levels to between 6.8 m and 7.0 m above Ordnance datum (AOD).

6.9.11 With regard to construction programme, both a simultaneous and phased construction scenario were noted for the Trains. Durations were not provided for the simultaneous scenario, however it was identified that in a phased construction scenario each CCGT generating plant would take approximately four years to construct.

6.9.12 No information was provided on the commissioning of the proposed CQLCP Abated Generating Station.

6.9.13 Estimates were provided of construction staffing requirements as well as peak construction traffic movements, which are summarised below:

- peak HGV movements were indicated to be 200 movements (100 in and 100 out) per day in both a phased and simultaneous construction scenario;
- peak construction workers in the phased construction scenario would be 1,000 workers, equating to 1,016 total (including HGV) vehicle movements (508 in and 508 out); and
- peak construction workers in the simultaneous construction scenario would be 1,600 workers, equating to 1,500 total (including HGV) vehicle movements (750 in and 750 out).

### *$CO_2$ Connection Corridor*

6.9.14 It was noted that works would be required to repurpose elements of the existing redundant gas infrastructure in the Repurposed $CO_2$ Connection Corridor (and partly in the Main Development Area) in order to export captured $CO_2$ emissions from the operation of the proposed CQLCP Abated Generating Station. An additional new extension to the redundant gas infrastructure was identified to connect into the Flint AGI to be constructed as part of the Hynet $CO_2$ Pipeline project. This proposed approach minimises the length and extent and construction works required on the linear portion of the project from the Main Development Area to the Flint AGI. The 24-inch (610 mm) pipe diameter is also consistent with the rest of the Hynet $CO_2$ Pipeline to Point of Ayr.

### *Water Connection Corridor*

6.9.15 At this stage, it was noted that the Proposed Development may require new cooling water infrastructure as technical studies had not been completed to confirm existing infrastructure could be reused.

### *Natural Gas Connection Corridor*

6.9.16 A connection corridor covering the existing connection to the existing Burton Point AGI was included at the non-statutory consultation stage, however it was noted that no works would be required and it was only included for access provision.

### *Construction Laydown Areas*

6.9.17 At this stage it was noted that areas would be required for construction laydown to facilitate material storage, site offices/ welfare facilities, batch concrete facilities, soil storage/ waste handling areas etc and internal temporary access routes and parking areas. No indication of the geographic extent of these construction laydown areas was presented within the EIA Scoping Report (**Appendix 1-A: Scoping Report** (**EN010166/APP/6.4**)). However, an approximate boundary of a single laydown area within the north-west of the Main Development Area was included in the newsletter shared at non-statutory consultation (see **Consultation Report** (**EN010166/APP/5.1**) and **Consultation Report Appendices** (**EN010166/APP/5.2**).

### *Construction and Indicative Enchantment Area*

6.9.18 At this stage it was noted that there was potential for this area to be required as additional laydown to facilitate the construction of the Proposed Development. It was to be retained and used for ecological enhancement for the duration of the project construction and operation.

### *Site Restoration and Reinstatement*

6.9.19 At the non-statutory consultation stage, it was stated that the overall objective of the site restoration and reinstatement would be to leave the areas of the Main Development Area required only for construction with no residual environmental and/ or safety risks and return the land to a condition suitable for re-use. It was noted that landscaping and ecological management would be provided as appropriate.

### *Access and Accommodation works*

6.9.20 Access to the Main Development Area for construction and operational traffic was noted to be via the existing site access from Kelsterton Road from the A548. It was identified that further technical studies were ongoing to consider likely construction traffic routes and access points including the potential requirement for any additional access points from the Kelsterton Road roundabout and the potential for direct access from the A548 to the existing roundabout on Kelsterton Road via reinstatement of the slip-road and junction used in construction of the existing Connah's Quay Power Station.

6.9.21 A secondary/alternative assess was also noted to the C&IEA where it was suggested Light Goods Vehicles (LGVs) and cars could gain access to the construction site. A series of other upgrades and alterations to internal access tracks within the Main Development Area were also noted. The secondary access is located off the B159 Kelsterton Road south of the existing National Grid 400 kV Deeside Substation.

6.9.22 A freight management strategy for the delivery of Abnormal Indivisible Loads (AILs) was not identified, however, it was noted the preference for this was delivery by road and that further assessment was to determine any modifications that may be required to existing highway infrastructure was required.

## Statutory Consultation

6.9.23 Statutory consultation was undertaken in October to November 2024. A Preliminary Environmental Information Report (PEIR) was published in support of the statutory consultation. At the statutory consultation stage, the Proposed Development remained largely unchanged from that presented at non-statutory consultation. However, feedback received from the non-statutory consultation and further design development and technical assessments informed the emerging design. The key differences are discussed within this section and summarised in **Table 6-4**.

### *Order limits*

6.9.24 In general, the area included within the Order limits expanded from approximately 112 ha within the EIA Scoping Report to approximately 187 ha within the PEIR as presented for the statutory consultation.

6.9.25 The majority of this change is accounted for by the inclusion of areas associated with potential temporary works to facilitate the transport of AILs and the unloading, handling, and storage of AILs at ports within the Order limits (**Design Change #1**). The process of identifying these (preliminary) locations was undertaken following non-statutory consultation and therefore these areas were first identified in advance of the statutory consultation.

6.9.26 A number of smaller changes were made to individual elements of the Order limits in relation to other design changes outlined below. These are (moving from west to east):

- **Design Change #2 –** amendment to the western boundary of the Proposed $CO_2$ Connection Corridor;
- **Design Change #3 –** amendment to remove the triangular extension on the western side of the Access to the Main Development Area, bordering the A548 and west of Kelsterton Road where a slip road was provided for the construction of the existing Connah's Quay Power Station;
- **Design Change #4 –** amendment to straighten the southern boundary of the Water Connection Corridor;
- **Design Change #5 –** amendment to remove a small gap in the Order limits between the Alternative Access to the Main Development Area and Access to the Indicative Enhancement Area, and include this area within the Alternative Access to the Main Development Area and Access to the C&IEA; and
- **Design Change #6 –** amendment to wholly remove the Natural Gas Connection Corridor.

6.9.27 In addition to the above changes, numerous minor amendments were made to the Order limits to align this with the latest available Land Registry title information. This was to allow for the removal of individual land parcels

where these would not be required for the construction or operation of the Proposed Development, whether for construction itself, access, or rights pertaining to the use of land or existing assets. These changes are routine for DCO projects as a whole and therefore are not considered as an individual Design Change; however, it is noted that these amendments may be visually apparent to the boundary of the Proposed $CO_2$ Connection Corridor and the Repurposed $CO_2$ Connection Corridor.

### *CQLCP Abated Generating Station*

6.9.28 Whilst the process associated with the plant remained unchanged, **Design Change #7** was the introduction of the possibility of including Electricity System Restoration capability within the design. This may comprise a single gas turbine started up from a small diesel generator or a small battery energy storage system (BESS).

6.9.29 The net electrical output capacity remained unchanged of up to a likely maximum of 1,380 MW, however a number of maximum parameters presented at the scoping stage were changed. These included:

- **Design Change #8 -** CCGT buildings increased from a maximum height of 32 m AGL to 50 m AGL;
- **Design Change #9 -** CCP (Absorber) stacks increased from a maximum height of 105 m AGL to 120 m AGL;
- **Design Change #10 -** HRSG buildings increased from a maximum height of 42 m AGL to a maximum height of 50 m AGL; and
- **Design Change #11 -** HRSG stacks increased from a maximum height of 56 m AGL to a maximum height of 85 m AGL.

6.9.30 Other maximum parameters were presented for the first time, including the maximum footprint of the proposed development and the maximum footprint of each train. An illustrative layout of the Proposed Development was also provided, as is replicated in **Figure 6-3: Proposals at Statutory consultation (October 2024)** (**EN010166/APP/6.4**), along with an indication of the maximum parameters.

6.9.31 Further details were presented of high level options for the drainage strategy and processes associated with domestic and sanitary effluent as well as wastewater. For wastewater it was noted that this could include either treatment on-site prior to discharge to the River Dee, or be transferred off-site. For domestic and sanitary effluent it was proposed that this would be discharged to the River Dee following storage and settlement in a septic tank.

6.9.32 Details associated with the storage of chemicals and materials were also presented, noting that there would be specific areas within the site designated for the delivery and storage of chemicals. Details of the anticipated chemicals required during the operation of the CQLCP Abated Generating Station were also provided.

### *Construction Activities and Programme*

6.9.33 A substantial amount of additional details on construction activities and programme were provided at the statutory consultation stage. This includes

further details on the assumptions on timescales of construction and the key phases. These were broadly aligned to those presented at the non-statutory consultation stage, including retaining both the phased and simultaneous construction scenarios. Indicative programmes were provided for both scenarios which also included an indication of commissioning.

6.9.34 It was identified that the phased construction scenario would take up to nine years to complete, whilst the simultaneous construction scenario was noted to last five years.

6.9.35 Further details were provided on each of the key stages of construction including:

- enabling works (such as site clearance and establishment of contactors compounds);
- earthworks;
- main works, including gas and electrical connections; and
- construction of the associated connection corridors.

6.9.36 There were no changes to the assumptions provided at the non-statutory consultation stage on construction staff numbers, with the exception of the clarification that a dedicated team of 10 construction workers would be required for the Proposed $CO_2$ Connection Corridor. However, changes were presented to the construction vehicle movements from those presented at the EIA scoping stage, as set out below:

- peak HGV movements for the phased construction remained unchanged at 200 movements (100 in and 100 out);
- peak HGV movements for the simultaneous phase were increased by 40 movements to 240 movements (120 in and 120 out);
- peak construction worker vehicles movements for the phased construction were reduced from 1,016 movements (508 in and 508 out) to 860 movements (430 in and 430 out); and
- peak construction worker vehicles movements for the simultaneous construction were reduced from 1,500 movements (750 in and 750 out) to 1,374 movements (687 in and 687 out).

6.9.37 With regards to construction working hours, core construction working hours were identified to be 07:00 to 19:00 Monday to Friday (except Bank Holidays) and 07:00 to 13:00 on Saturdays. However, it was noted that some construction activities would likely need to be undertaken outside of these core working hours.

### *$CO_2$ Connection Corridor*

6.9.38 There were no changes presented in relation to the $CO_2$ connections corridors. Details were provided on the envisaged access to this corridor, which comprised the HyNet $CO_2$ Pipeline Project access to the Flint AGI.

### *Water Connection Corridor*

6.9.39 At the statutory consultation stage, both options for works in the water connection corridor were retained. Descriptions were provided on

construction methodologies associated with both the re-use / upgrade of existing cooling water infrastructure and construction of new cooling water infrastructure. Both options were noted to potentially require the use of temporary cofferdams and the requirement for dredging was not confirmed.

### *Natural Gas Connection Corridor*

6.9.40 The natural gas connection corridor from the existing Connah's Quay AGI within the Main Development Area to the Existing Burton Point AGI was removed from the Order limits as it was confirmed no works were required (**Design Change #6**).

### *Construction Laydown Areas*

6.9.41 Indicative extents of construction laydown areas were presented and have been replicated in **Figure 6-4: Indicative Construction Laydown Areas at Statutory Consultation (October 2024)** (**EN010166/APP/6.3**). This includes areas within the Main Development Area and the C&IEA (**Design Change #12**). These areas within the Main Development Area were also quantified for both the phased and simultaneous construction scenarios as summarised below:

- the phased construction would require an additional 5 ha of land beyond the footprint of Train 1 and Train 2; and
- the simultaneous construction would require an additional 10.8 ha of land beyond the footprint of Train 1 and Train 2.

### *Construction and Indicative Enchantment Area*

6.9.42 Whilst at the non-statutory consultation stage this area was noted as an area of enhancement, the updated proposals at the statutory consultation stage considered this area as a construction laydown area for both the phased and simultaneous construction scenarios. The land take requirements for both options were different, with the phased construction area requiring a smaller area (6.3 ha) when compared to the simultaneous construction (10.9 ha). In both scenarios a minimum 30 m ecological safeguard zone was identified around the northern boundary. The extent of these areas is shown in **Figure 6-4: Indicative Construction Laydown Areas at Statutory Consultation (October 2024)**.

### *Site Restoration and Reinstatement*

6.9.43 Site restoration and reinstatement remained as described at the non-statutory consultation stage.

### *Access and Accommodation works*

6.9.44 There were are a number of design changes proposed in relation to the site access strategy, including:

- **Design Change #3 –** removal of the slip-road between the A548 and Kelsterton Road (reinstating the previous alignment used during construction of the existing Connah's Quay Power Station); and

- **Design Change #1** – provision of new information on additional works required to facilitate AIL movements to the Main Development Area, including additional areas of the Order limits.

6.9.45 It was noted that main access would be via the existing access to the existing Connah's Quay Power Station site along Uniper Way from Kelsterton Road via the A548. Access from Kelsterton Road is via two roundabouts and crosses the North Wales Main Line railway (an operational rail line located in a tunnel section beneath the access road). Other arrangements were updated and whilst the slip road between the A548 and Kelsterton Road (reinstating the previous alignment used during construction of the existing Connah's Quay Power Station) was removed (**Design Change #3**), the reinstated bell mouth from the A548 (used during construction of the existing Connah's Quay Power Station) was retained. The alternative access was retained as described at the non-statutory consultation stage.

6.9.46 Following further analysis that was noted at the non-statutory consultation stage, details of the proposals associated with the facilitation of AIL movements to the Main Development Area were presented, including where the Order limits had been expanded to include these proposals (**Design Change #1**). These were in relation to:

- works required at the Port of Mostyn, limited to the provision of temporary mobile cranes, the securing of rights to use, offload at, and store materials at the port, temporary laydown areas, and works to the entrance of the port;
- works required at Ellesmere Port, limited to provision of temporary mobile cranes, the securing of rights to use, offload at, and store materials at the port, and temporary laydown areas;
- works at Connah's Quay North, including works in-river (berthing of vessel) and quayside, and the securing of rights to use, offload at, and store materials adjacent to the jetty;
- works on the highway network along the A548 to facilitate movements of AILs from Port of Mostyn to the Main Development Area, including tree works, works to street furniture, works to Chester Road Roundabout and Tir Glas Roundabout and modifications to the A548 central reservation at Kelsterton Road; and
- works on private roads and the highway network to facilitate movement of AILs between Connah's Quay North and the Main Development Area, including carriageway works.

6.9.47 The potential requirement for works on the highway network between Ellesmere Port and the Main Development Area was not examined in sufficient detail to allow for the identification of specific potential works and locations.

### *Summary of Key changes between Non-Statutory Consultation and Statutory Consultation*

6.9.48 A summary of the design changes made between the non-statutory consultation and the statutory consultation is presented in **Table 6-4**, along with further justification for each required change. In addition, a number of

other changes were made to aspects of the project including construction program and transport, as the development has matured.

**Table 6-4: Summary of The Design Changes Made Between Non-Statutory Consultation and Statutory Consultation**

| Design Change | Description | Justification |
|---|---|---|
| #1 | Inclusion of areas associated with potential temporary works to facilitate the transport of AILs and the unloading, handling, and storage of AILs at ports within the Order limits. | The process of identifying these (preliminary) locations was undertaken following non-statutory consultation and therefore these areas were first identified in advance of the statutory consultation. |
| #2 | Amendment to the western boundary of the Proposed $CO_2$ Connection corridor. | To align with the Order limits for the HyNet Carbon Dioxide Pipeline Order 2024, as the corresponding site entrance is to be re-used. |
| #3 | Amendment to remove the triangular extension on the western side of the Access to Main Development Area, bordering the A548 and west of Kelsterton Road. | It has been confirmed that the reinstatement of the former slip road used during construction of the existing Connah's Quay Power Station is not to be undertaken for the Proposed Development. |
| #4 | Amendment to straighten the southern boundary of the Water Connection Corridor. | The identified proposed works for the construction of new cooling water infrastructure included the use of trenchless construction for the pipelines to reduce environmental impacts in the Dee Estuary. This method can only be applied in straight sections of pipeline, requiring a direct path between the Main Development Area and the intake location, which would have otherwise fallen outside of the Order limits. |
| #5 | Amendment to remove a small gap in the Order limits between the Alternative Access to the Main Development Area and Access to the C&IEA and include this area within the Alternative | The gap may have complicated future access arrangements to the C&IEA should the location of necessary works fall within the gap. Additionally, the gap was not to exclude a separate landowner or land parcel from the Proposed Development so offered no benefit itself. |

| Design Change | Description | Justification |
|---|---|---|
| | Access to Main Development Area and Access to C&IEA. | |
| #6 | Amendment to wholly remove the Natural Gas Connection Corridor. | It has been confirmed that it would not be necessary to include this within the DCO as no works will take place to these assets other than those which are permitted by existing rights. |
| #7 | Introduction of Electricity System Restoration capabilities. | To allow for the Proposed Development to be restarted in the event of lost grid connection or de-energisation of the national grid, and to allow for the Proposed Development to support the restoration of power to the national grid. |
| #8 | CCGT buildings increased from a maximum height of 32 m AGL to 50 m AGL; | To include provision of a 17 m air filter on the CCGT building roof. |
| #9 | CCGT stacks increased from a maximum height of 105 m AGL to 120 m AGL. | To account for ongoing design work and to mitigate against potential significant adverse effects with regard to air quality. |
| #10 | HRSG buildings increased from a maximum height of 42 m to a maximum height of 50 m AGL. | Building heights increased to provide a worst-case height envelope for the PEIR, using emerging information from other carbon capture projects with consent applications in the public domain. |
| #11 | HRSG stacks increased from a maximum height of 56 m to a maximum height of 85 m AGL. | Stack heights increased to reflect those of the existing plant on the basis that this would provide greater flexibility if unabated running was required. |
| #12 | Amendments to the extent of construction laydown areas. | Confirmation of the use of the A station site (C&IEA) for construction laydown. |

## Post-statutory consultation

6.9.49 Following the statutory consultation, the design of the Proposed Development has continued to evolve through further technical studies and assessment as well as in response to the comments received during the statutory consultation.

6.9.50 A non-statutory targeted consultation was carried out between May and June 2025 due to the proposed increases in stack heights (**Design Changes #13** and **#14**, detailed below).

6.9.51 The key design changes are discussed below and are summarised in **Table 6-5**.

6.9.52 In addition to the below changes, numerous minor amendments were made to the Order limits to align with the latest available Land Registry title information following the statutory consultation, to align with the approved Order limits of the HyNet $CO_2$ Pipeline Project, and to minimise the extent of public highway land within the Order limits (as shown on **Figure 6-5: Reduction from the Initiative Site Boundary at PEIR to the Order Limits** (**EN010166/APP/6.3**)). This was to allow for the removal of individual land parcels where these would not be required for the construction or operation of the Proposed Development, whether for construction itself, access, or rights pertaining to the use of land or existing assets. These changes are routine for DCO projects as a whole and therefore are not considered as an individual Design Change.

### *CQLCP Abated Generating Station*

6.9.53 The net electrical output capacity remained unchanged at up to a likely maximum of 1,380 Mwe; however the maximum parameters of the CCP (absorber) and HRSG stacks were increased to reflect ongoing technical assessments related to the expected air quality emissions from the proposed CQLCP Abated Generating Station. These included:

- **Design Change #13** – CCP (Absorber) stacks increased from a maximum height of 120 m AGL to 150 m AGL, which will necessitate the use of obstacle lighting (proposed 12 per stack) in accordance with relevant guidance;
- **Design Change # 14** – HRSG stacks increased from a maximum height of 85 m AGL to a maximum height of 150 m AGL, which will necessitate the use of obstacle lighting (proposed 12 per stack) in accordance with relevant guidance;
- **Design Change #15** – design option/scenario for two CCGT (absorber) stacks per Train has been removed / confirmation of single CCGT stack per Train; and
- **Design Change #16** – removal of the wide 'blast stacks' from each Train.

6.9.54 The increase in the height of the stacks mitigates the human health and ecological adverse effects of the Proposed Development. In determining the new maximum height parameters, the Applicant considered the potential effect on the landscape and visual impacts as well as on the setting of

designated heritage assets such as listed buildings and scheduled monuments. The blast stacks have been removed following technical design development following statutory consultation and feedback from FEED contractors.

6.9.55 The only other change to the operational layout of the CQLCP Abated Generating Station itself is the location of the Proposed $CO_2$ AGI, which has been relocated within the Main Development Area (**Design Change #17**). It was previously located within the western corner of the Main Development Area, separate from the CQLCP Abated Generating Station itself. As the Proposed $CO_2$ AGI is safety critical infrastructure for the operation of the CQLCP Abated Generating Station there would be ground raising to mitigate the risk of flooding to the Proposed $CO_2$ AGI, itself also separate from ground raising for the CQLCP Abated Generating Station. However, following further development of the outline drainage design it was noted that a viable drainage solution for this position, due to both the distance to the Surface Water Outfall Area and the separated extents of ground raising, would not be technically feasible. The location was moved to be adjacent to Train 1, as described in **Chapter 4: The Proposed Development** (**EN010166/APP/6.2.4**).

6.9.56 Though it does not affect the operational layout of the CQLCP Abated Generating Station, it was confirmed that ground raising for the CQLCP Abated Generating Station and associated critical infrastructure would be to 7.4 m AOD, revised down from a previous assumption of 7.9 m AOD (**Design Change #18**). It was also confirmed that the minimum finished floor level would be 7.7 m AOD across the same extent. These confirmations occurred after the non-statutory targeted consultation.

6.9.57 The route of the permanent proposed access route for members of the Deeside Naturalists Society (DNS) to access facilities on the north and north-eastern boundary of the development has been identified and included in the indicative design (**Design Change #19**). The need for this permanent access was identified previously ahead of statutory consultation but a specified route was not. However, the facilities this route is to facilitate access to, previously identified as 'Access to Wildlife Hides' ahead of statutory consultation, have been removed from the Order limits and the Proposed Development (**Design Change #20**).

6.9.58 Additional areas have also been identified as operational laydown areas (referred to as the 'Maintenance Laydown Area') within areas previously retained for landscaping purposes (**Design Change #21**). The Maintenance Laydown Area has been included because maintenance outages and staff requirements had been identified ahead of statutory consultation but no specific location for these operational activities and staff to be accommodated within the Main Development Area had been identified.

### *Construction Activities and Programme*

6.9.59 The construction programme and assumptions largely remain unchanged from the statutory consultation stage. However, the core working hours were amended to reflect feedback from Flintshire County Council. The working hours identified in **Chapter 5: Construction Management and Programme** (**EN010166/APP/6.2.5**) are as follows:

- 08:00 to 18:00 Monday to Friday (except Bank Holidays); and
- 08:00 to 13:00 on Saturdays.

6.9.60 Flexibility has been retained for some construction activities to be undertaken outside of these core working hours.

### *Water Connection Corridor*

6.9.61 Following the feedback received at the statutory consultation stage and further engagement with NRW, the Applicant has removed the option for new cooling water abstraction and discharge infrastructure and the option for extensive/ intrusive refurbishment of existing cooling water infrastructure. The works within the River Dee would be limited to minor works to the existing cooling water abstraction infrastructure within the existing protection structure (**Design Change #22**). The Order limits for the Water Connection Corridor has accordingly been reduced to include only the location of these works, required land-based access routes, the location of temporary barge moorings, and the existing land-based water intake pipes (to secure the right to future/continued use of the existing asset).

### *$CO_2$ Connection Corridors*

6.9.62 It was confirmed that no physical works would be required in the Repurposed $CO_2$ Connection Corridor. It has been retained in the Order limits, but with reduced width from a maximum of 100 m down to a maximum of 24.4 m (**Design Change #23**).

6.9.63 No changes have been made to the Proposed $CO_2$ Connection Corridor following statutory consultation other than the confirmation of the temporary compound location (**Design Change #24**).

### *Construction Laydown Areas*

6.9.64 Following the relocation of the Proposed $CO_2$ AGI, minor amendments to the layout of the construction laydown areas within the Main Development Area were made (**Design Change #25**) to reflect this. Changes to laydown requirements also included additional land at the western boundary of the Main Development Area for laydown and the removal of land adjacent to the north of the CQLCP Abated Generating Station. Additionally, laydown areas were amended to include the Maintenance Laydown Area south of the CQLCP Abated Generating Station, which would also be utilised during construction works (**Design Change #21**).

### *Access and Accommodation works*

6.9.65 Following the completion of further routing analysis and further engagement with the Port of Mostyn and Ellsmere Port, it was confirmed that neither port would require the provision of additional temporary mobile cranes and would not require works to create laydown areas within the ports themselves. As a result the Order limits have been reduced in these areas (**Design Change #26**). The works at the entrance to the Port of Mostyn remain as described at the statutory consultation stage with a revised boundary for the Order limits to encompass these only (**Design Change #27**).

6.9.66 The further routing analysis also confirmed no modifications to the highway were required to facilitate AIL movements from Ellesmere Port to the Main

Development Area assuming AILs could be limited to 5 m in height. These works are described in detail in **Chapter 5: Construction Management and Programme** (**EN010166/APP/6.2.5**).

**Table 6-5: Summary of The Design Changes Made Following Statutory Consultation**

| Design Change | Description | Justification |
|---|---|---|
| #13 | CCGT stacks increased from a maximum height of 120 m AGL to 150 m AGL. | Further analysis and assessment identified that an increased stack height was required to mitigate the human health and ecological effects of the project. |
| #14 | HRSG stacks increased from a maximum height of 85 m AGL to a maximum height of 150 m AGL. | |
| #15 | Design option/scenario for two CCGT stacks per Train has been removed / confirmation of single CCGT stack per Train. | Following further technical studies, technology providers confirmed that each CCGT train can be served by a single CCP, reducing the complexity of the plant required to be provided. |
| #16 | Removal of the wide 'blast stacks' from each Train. | Following further technical studies, it has been identified that the 'blast stacks' are no longer required in the plant design. |
| #17 | The Proposed $CO_2$ AGI has been relocated within the Main Development Area. | The Proposed $CO_2$ AGI was previously located within the western corner of the Main Development Area, separate from the CQLCP Abated Generating Station itself. As the Proposed $CO_2$ AGI is safety critical infrastructure for the operation of the CQLCP Abated Generating Station there would be ground raising to mitigate the risk of flooding to the Proposed $CO_2$ AGI, itself also separate from ground raising for the CQLCP Abated Generating Station. However, following further development of the outline drainage design it was noted that a viable drainage solution for this position, due to both the |

| Design Change | Description | Justification |
|---|---|---|
| | | distance to the Surface Water Outfall Area and the separated extents of ground raising, would not be technically feasible. Relocation was to create a single area of ground raising or highly proximate areas of targeted ground raising which would allow for a technically feasible drainage design for surface water. |
| #18 | Confirmation of ground raising to 7.4 m AOD (revised from previous assumption of 7.9 m AOD) and minimum finished floor level of 7.7 m AOD across the CQLCP Abated Generating Station and associated critical infrastructure. | Following further technical studies and flood modelling (**Appendix 13-F: Hydraulic Modeling Report** (**EN010166/APP/6.4**)), this was confirmed as sufficient ground raising required to mitigate the risk of impacts from flooding to the CQLCP Abated Generating Station and associated critical infrastructure. |
| #19 | The route of the permanent proposed access route for members of the DNS to access facilities on the north and north-eastern boundary of the development has been identified and included in the indicative design. | The permanent access route had been mentioned as a requirement for operation of the Proposed Development ahead of statutory consultation but no specific location had been identified within the Main Development Area. |
| #20 | Access to Wildlife Hides removed from the Order limits. | These had been included to allow for potential works at these locations. However, as these works are not associated development for the project, they have not been included within the proposals. |

| Design Change | Description | Justification |
|---|---|---|
| #21 | Inclusion of Maintenance Laydown Areas within indicative design. | The Maintenance Laydown Area has been included because maintenance outages and staff requirements had been identified ahead of statutory consultation but no specific location for these operational activities and staff to be accommodated within the Main Development Area had been identified. |
| #22 | Removal of the option for new cooling water abstraction and discharge infrastructure and removal of option for extensive/ intrusive refurbishment of existing cooling water infrastructure, and amendment of Water Connection Corridor boundary. | Due to the sensitivity of the land within the Water Connection Corridor, which overlaps several designated sites, extensive construction within the Water Connection Corridor was considered likely to cause significant effects. It was also proven via technical study that the existing cooling water infrastructure could be upgraded to adhere to the Eel Regulations 2009 with minor surface-level repairs with minimal interaction with the land and no interaction with the riverbed. To minimise the risk of likely significant effects while producing a functional operational Proposed Development, options other than the minimal upgrades/ repairs were removed and the Order limits were realigned to match the remaining design proposal. |
| #23 | Reduction of Repurposed $CO_2$ Connection Corridor width from a maximum of 100 m down to a maximum of 24.4 m. | It has been confirmed that no construction works authorised by the Application will be undertaken within the Repurposed $CO_2$ Connection Corridor. The land has however been retained, but with a |

| Design Change | Description | Justification |
|---|---|---|
| | | reduced width, to secure the rights to future use of the pipeline through the Application. |
| #24 | Confirmation of temporary compound location within Proposed $CO_2$ Connection Corridor. | The compound had been mentioned as a requirement for construction of the Proposed Development ahead of statutory consultation, but no specific location had been identified within the Proposed $CO_2$ Connection Corridor. The location has now been identified. |
| #25 | Amendments to temporary construction laydown area boundaries within Main Development Area. | To account for changes to the location of the Proposed $CO_2$ AGI and to maximise available space for temporary laydown within the Main Development Area. |
| #26 | Removal of AIL vessel mooring, offloading, and temporary storage areas at Ports of Mostyn and Ellesmere from the Order limits. | Following discussions with the port authorities, it was identified that the proposed use of the ports would fall within routine existing commercial operations for the existing commercial ports without the need for further works or powers. |
| #27 | Works to widen access/egress across the level crossing at Port of Mostyn. | Following technical study and analysis of swept-path modelling for AIL of the size outlined within the Application, it was deemed necessary to widen the existing access gates to facilitate the size of AIL required for construction of the Proposed Development (and to revise the Order limits to allow for these works to be undertaken within the Order limits). |

# References

Ref 6-1 HM Government (2017). Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 [online]. Available at: https://www.legislation.gov.uk/uksi/2017/572/contents/made (Accessed 29/07/25)

Ref 6-2 DESNZ (2023). Overarching National Policy Statement for Energy (EN-1) [online]. Available at: https://www.gov.uk/government/publications/overarching-national-policy-statement-for-energy-en-1 (Accessed 29/07/25)

Ref 6-3 DESNZ (2023). National Policy Statement for Natural Gas Electricity Generating Infrastructure (EN-2) [online]. Available at: https://www.gov.uk/government/publications/national-policy-statement-for-natural-gas-electricity-generating-infrastructure-en-2 (Accessed 29/07/25)

Ref 6-4 DESNZ (2023). National Policy Statement for Natural Gas Supply Infrastructure and Gas and Oil Pipelines (EN-4) [online]. Available at: https://www.gov.uk/government/publications/national-policy-statement-for-natural-gas-supply-infrastructure-and-gas-and-oil-pipelines-en-4 https://assets.publishing.service.gov.uk/media/64252f7260a35e00120cb159/NPS_EN-4.pdf(Accessed 29/07/25)

Ref 6-5 DESNZ (2023). National Policy Statement for Electricity Networks Infrastructure (EN-5) [online]. Available at: https://www.gov.uk/government/publications/national-policy-statement-for-electricity-networks-infrastructure-en-5 (Accessed 29/07/25)

Ref 6-6 DESNZ (2024). CCUS Track-1 Expansion. HyNet Application Guidance [online]. Available at: https://assets.publishing.service.gov.uk/media/659e8ba6e96df5000df843e0/ccus-track-1-expansion-hynet-application-guidance.pdf (Accessed 29/07/25)