CAS-03463-R2W9C2 - Kronospan Low Carbon CHP Facility

Environmental Statement

Vol2: Chapter 4.0 – Description of the Proposed Development

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4.0 DESCRIPTION OF THE PROPOSED DEVELOPMENT

4.1 Introduction

4.1.1 This chapter of the Environmental Statement (ES) provides a description of the layout and design of the various components of the Proposed Development, the operational processes that would occur, and the proposed energy generation shift that the Proposed Development would enable. A description of the anticipated construction approach, including the measures proposed to mitigate potential construction phase effects is also provided.

4.2 Overview of the Proposed Development

Introduction

4.2.1 The Proposed Development (see Location Plan at **Figure 1.1**, **DNS3-001** and DNS Drawings at **DNS3-002 – DNS3-011** is a Low Carbon Combined Heat and Power (CHP) Facility with the capacity to generate up to 40 megawatts (MW) of renewable electricity and 125 MW of renewable thermal energy for use in the existing manufacturing processes at the existing Kronospan Facility.

4.2.2 Several existing components would be required to be removed entirely, removed and relocated, and removed and replaced with new; the most notable such component is the existing Gas Turbines 1 and 2 which would be decommissioned and removed (as an inherent part of the Proposed Development and attaining the core objective of decarbonisation).

4.2.3 The proposed Low Carbon CHP Facility would process up to 293,000 tonnes per annum (TPA) of waste wood and forestry residues as feedstock for the existing Kronospan Facility.

4.2.4 Based on the likely availability of feedstock that can be generated on-site (based on an average taken from the calendar years 2021, 2022, and 2023), the proposed (on-site) feedstock configuration for the proposed Low Carbon CHP Facility would be as follows:

- Existing on-site process residues currently sold off-site – 76,991 TPA.
- Diverted fuel from the existing K7 Biomass Plant - 74,667 TPA.
- Other on-site process residues – 108,455 TPA.

- **Total feedstock generated on-site = 260,113 TPA.**

4.2.5 Further details of the proposed changes to how energy would be generated and used on-site and the proposed feedstock are provided below under the headings '4.3 - Site Wide Energy Generating Implications' and '4.6 - Feedstock'.

4.2.6 The estimated lifespan of the proposed Low Carbon CHP Facility is 40 years. Subject to ongoing maintenance and adherence to environmental controls implemented via the environmental permitting process, the actual lifespan of the proposed Low Carbon CHP Facility could be shorter or longer than 40 years depending on:

- The rate and scale of technological advancement associated with CHP technology as well as other existing or new power technologies.
- The ability for some components of the proposed Low Carbon CHP Facility to be subsequently upgraded in the future.
- The lack of absolute certainty with regards the future power requirements of the existing Kronospan Facility.
- The direction of future energy policy.

4.2.7 Subsequently, whilst 40 years is considered a reasonable lifespan to assume for the purpose of Environmental Impact Assessment (EIA), this Development of National Significance (DNS) application is seeking the permanent construction and operation of the proposed Low Carbon CHP Facility.

4.3 Site Wide Energy Generating Implications

4.3.1 The Applicant recognises its presence in an energy-intensive industry and the substantial energy requirements inherent to the production of wood-based panel products. At present, Kronospan derives its energy from a range of sources as follows:

- K7 and K8 Biomass Plants (thermal oil heating).
- Gas turbines 1 and 2 (electrical and exhaust gases used for thermal).
- Gas engines 1 – 3 (electrical and thermal).
- Electrical via its 33kV connection to the electrical grid (to be upgraded to a new 132kV connection direct from the existing Legacy to Oswestry 132kV overhead

line as part of the implementation of planning permission P/2022/1080) (further details provided at **Section 1.3, ES Chapter 1.0 (Introduction)**).

4.3.2 The K7 and K8 Biomass Plants have a design thermal fuel input of 38 MW and 32 MW respectively and provide heat for thermal oil for Particleboard (PB), Medium Density Fibreboard (MDF) 1 & 2, plastics and impregnation lines as well as process steam via the thermal oil to steam generation. The K7 and K8 Biomass Plants do not generate electricity for on-site use or external export.

4.3.3 The oriented strand board (OSB) Facility granted 14 August 2019 under appeal reference APP/H6955/A/19/3227571 (further details provided at **Section 1.3, ES Chapter 1.0 (Introduction)**) at the western extent of the existing Kronospan Facility is currently under construction. The OSB Facility will increase the power requirements of the existing Kronospan Facility; subsequently, the existing Kronospan Facility requires increased generating capacity.

4.3.4 The Proposed Development would enable a significant shift in the way that Kronospan generates energy (electricity and heat) to power its existing operations. Currently, the existing Kronospan Facility consumes:

- 7.7% and 3.2% of the non-domestic gas consumption and total gas consumption (respectively) in Wales, and
- 48.4% and 35.7% of the non-domestic gas consumption and total gas consumption (respectively) in the County of Wrexham.

4.3.5 The proposed Low Carbon CHP Facility would generate more heat and power than the existing K7 and K8 Biomass Plants and would enable Kronospan to significantly reduce its reliance on the on-site gas engines that are currently used to provide additional heat and power to the existing Kronospan Facility whilst also reducing its reliance on the electrical grid. As such, the proposed energy shift would provide significant environmental benefits due to the reduction in the burning of fossil fuels (gas) and an increase in the use of renewable biomass material; this would help to significantly decarbonise Kronospan’s wood product manufacturing processes, increase energy security, and make a valuable contribution to meeting the Welsh Government’s Net Zero commitments.

4.3.6 From a greenhouse gas (GHG) emissions perspective, **ES Chapter 9.0 (Climate Change)** concludes that the proposed Low Carbon CHP Facility would result in a net carbon benefit of 3,024,740 tCO_2e (tonnes of carbon dioxide equivalent) over its estimated 40-year lifespan and would provide carbon benefits throughout each carbon budget period considered. The proposed Low Carbon CHP Facility would therefore be consistent with existing and emerging policy requirements (see the Planning Statement (**DNS4-001**) for further details).

4.3.7 The proposed shift in energy generation/use is summarised in **Table 4.1** below.

Table 4.1 – Proposed Energy Generation Shift under 'Normal' Operations

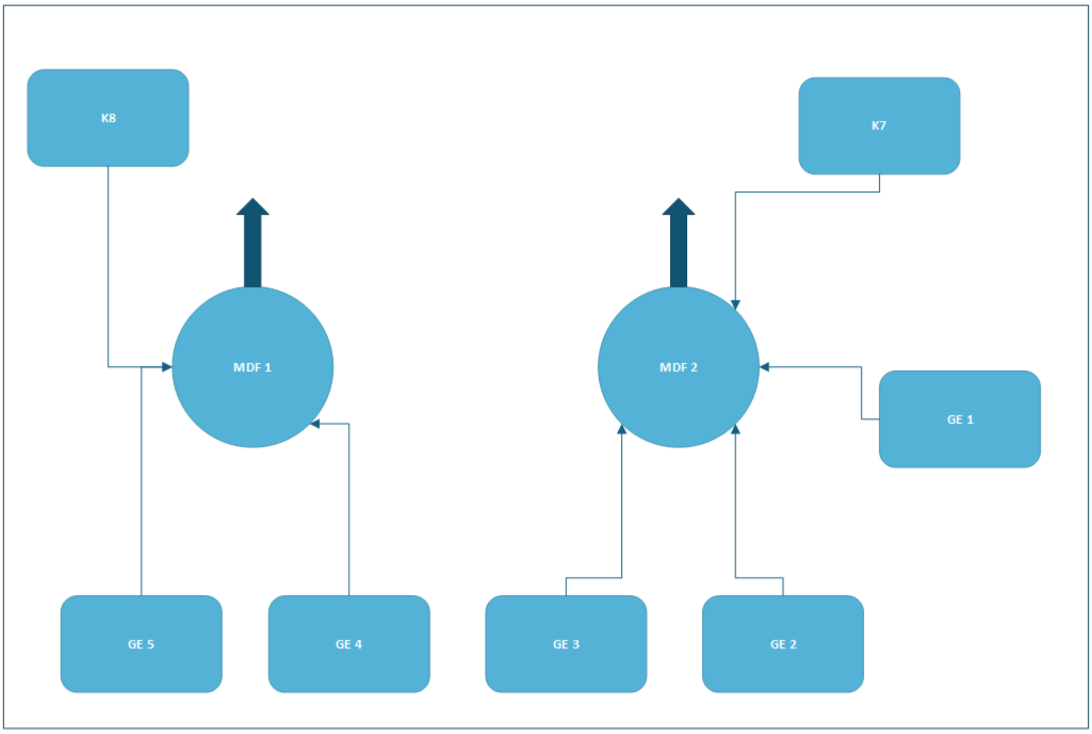
Component	Current Status	Proposed Status
K7 Biomass Plant	Accepts Chapter IV and Annex VI exempt waste biomass (as per the Industrial Emissions Directive (2010/75/EU) (IED) Provides heat for thermal oil for PB, MDF2, plastics and impregnation lines as well as process steam via the thermal oil to steam generation. Combustion gases are used in MDF2 dryer for direct drying purposes; combustion gases released through MDF2 cyclone. If MDF2 dryer is offline, combustion gases from the K7 Biomass Plant are diverted to MDF1 dryer.	K7 Biomass Plant would remain in situ but be used as a back-up (for when the proposed Low Carbon CHP Facility and the existing K8 Biomass Plant have their annual shutdowns) – fuel currently used in the K7 Biomass Plant would be diverted to the proposed Low Carbon CHP Facility and exhaust gases used for drying purposes in the MDF2 dryer.
K8 Biomass Plant	The Environmental Permit allows the acceptance of waste biomass that is not exempt from IED Chapter IV, specifically waste code 19 12 07 which includes wood from waste management facilities and waste code	K8 Biomass Plant would remain in operation (for use in MDF1 process).

Component	Current Status	Proposed Status
	20 01 38 which includes municipal waste wood. Provides heat for thermal oil for PB, MDF1, plastics and impregnation lines as well as process steam via the thermal oil to steam generation. Combustion gases are used in MDF1 dryer for direct drying purposes; combustion gases released through MDF1 cyclone. If MDF1 dryer is offline, combustion gases from the K8 Biomass Plant are diverted to the MDF2 dryer.	
Gas Turbines 1 and 2	Electricity generated is used to power site operations. Waste heat is used for the direct drying of product from the primary manufacturing process via MDF1 dryer (Gas Turbine 1) and MDF2 dryer (Gas Turbine 2).	Both gas turbines would be decommissioned and removed as they are within the footprint of the proposed Low Carbon CHP Facility. Waste heat from the proposed Low Carbon CHP Facility would replace the waste heat from Gas Turbines 1 and 2 (with respect to subsequent drying of product via MDF1 and MDF2 dryers).
Gas Engines 1 - 3	Gas Engines 1 – 3 are installed and generate electricity used to power site operations. Waste steam is used for MDF2 manufacturing processes and waste heat is used for the direct drying of product from the primary	Gas Engines 1 – 3 would remain in situ and will provide peak and standby generating capacity. The gas engines may be used in tandem with the other energy generating facilities (including the proposed Low Carbon CHP Facility) depending on

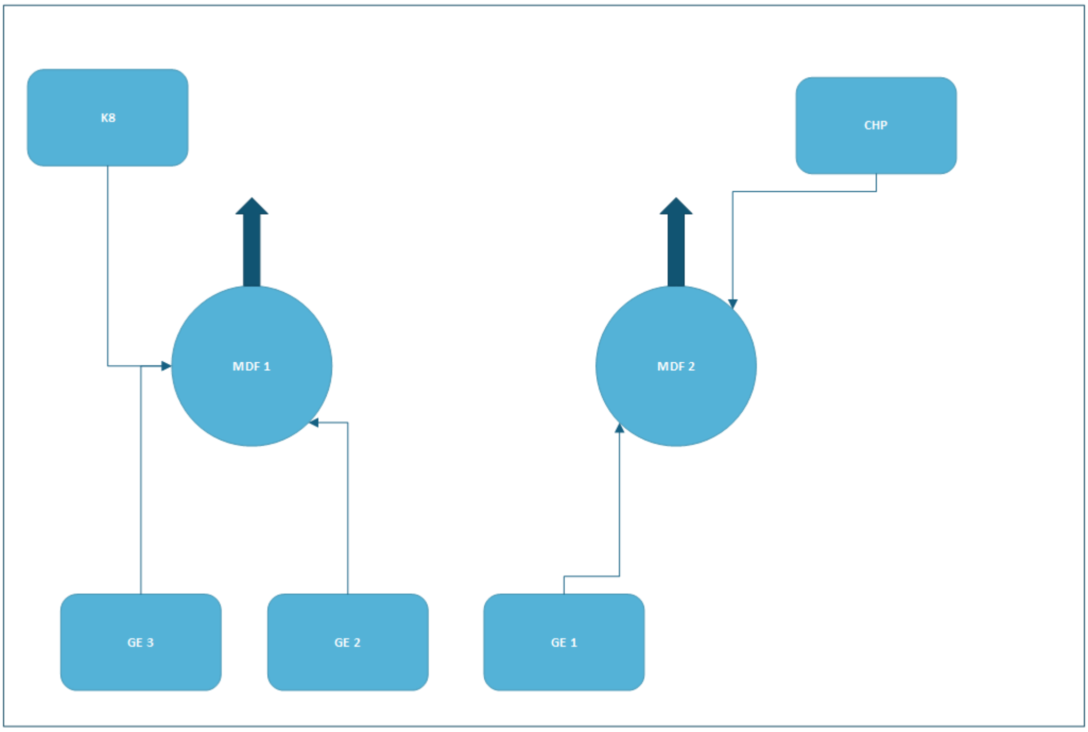
Component	Current Status	Proposed Status
	manufacturing process via the MDF2 dryer. If MDF2 is offline, Gas Engines 2 and 3 are diverted to MDF1.	comparative imported gas and electricity costs; the running of the gas engines is expected to be infrequent. This has been allowed for in the GHG assessment (see ES Chapter 9.0 (Climate Change) as the impact has been based on the net change in gas use allowing for the operation of one gas engine and the other two engines running for the proposed Low Carbon CHP Facility's annual outage.
Gas Engines 4 and 5	Consented but not yet installed.	Gas Engines 4 and 5 would not be installed.

4.3.8 The existing and proposed MDF1 and MDF2 operating scenarios (including operation of the OSB Facility) are presented in **Inset 4.1** and **Inset 4.2** below.

Inset 4.1 – Existing Operation Scenario



Inset 4.2 – Proposed Operation Scenario



4.3.9 In the proposed operation scenario (**Inset 4.2**), should the MDF1 dryer be offline, combustion emissions from the K8 Biomass Plant would be diverted to MDF2; should

MDF2 be offline, the proposed combustion emissions from the proposed Low Carbon CHP Facility would be diverted to MDF1.

4.3.10 All existing and proposed operating scenarios (including both MDF1 and MDF2 offline scenarios) are presented and discussed in further detail at **Appendix 6C**.

4.4 Key Components

4.4.1 The proposed Low Carbon CHP Facility would comprise the following key components:

- Feedstock Storage and Handling
- Boiler Building
- Turbine Building
- Service Building
- Air Cooled Condenser (ACC)
- Flue Gas Treatment (FGT) Facility
- Air Pollution Control (APC) Reagent Provisions (lime silo and ammonia tank)
- Ash Silo (FGT)
- Ash Pit (bottom ash)
- Water treatment
- Stack

4.4.2 The design of the Proposed Development is provided on the DNS Drawings at **DNS3-002 – DNS3-011** which provides details of approximate dimensions of the key components and how the Proposed Development would be integrated into the other existing site operations. The tallest component (all heights taken from ground level) would be the stack (75m) which has been determined by way of (air quality) dispersion modelling. Details of the stack height assessment and air quality dispersion modelling are provided in **ES Chapter 6 (Air Quality and Odour)**.

4.4.3 An overview of the approximate heights of the key components is provided in **Table 4.2** below.

Table 4.2 – Approximate Heights of Proposed Development Key Components

Proposed Development Component	Approximate Height (metres)
Feedstock Storage 1 - Silos	33.5m
Feedstock Storage 2 – Building	11.2m
Feedstock Screening Facilities	14m
Boiler Building	41.7m
Turbine Building	17m
Service Building	15m
ACC (on elevated steel structure)	21.2m
Flue Gas Treatment Facility	Bag Filter and Induced Draft (ID) Fan – 43.85m Selective Catalytic Reduction (SCR) System for Nitrogen Oxide Reduction – 31.5m
APC Reagent – Lime Silo	22.3m
APC Reagent – Ammonia Tank	4m
Ash Silo (FGT)	26.7m
Ash Pit (bottom ash)	3.8m
Stack	75m

4.4.4 Whilst the proposed stack would be the tallest structure on the wider Kronospan Facility, there are already several stacks (close to the proposed Low Carbon CHP Facility) which vary in height between 50m and 70m. Certain aspects of the Proposed Development have been carefully designed and considered at the outset to avoid or minimise the potential for significant adverse effects, including the following:

- Requirement to adhere to the limits within the Environmental Permit (which would need to demonstrate compliance with Best Available Techniques (BAT) for the process).
- The careful placement of the proposed Low Carbon CHP Facility, away from residential receptors and close to existing energy-related components (and the existing stacks) would serve to minimise the visual impact of the proposed Low Carbon CHP Facility. See **Section 3.2** of **ES Chapter 3.0 (Alternatives)** for further details.
- Careful consideration of the layout and arrangement of the proposed Low Carbon CHP Facility to ensure the relatively restricted space can be utilised for the proposed Low Carbon CHP Facility and achieve the core objective of generating up to 40 MW of electricity and 125 MW of thermal energy for use in the existing manufacturing processes at the existing Kronospan Facility (via a maximum feedstock throughput capacity of 293,000 TPA), whilst not resulting in unacceptable environmental impact. See **Section 3.3** of **ES Chapter 3.0 (Alternatives)** for further details.
- Improving the efficiency of the existing chip screening process to enable the existing chip silos to hold screened chips (rather than unscreened chips). This would have the benefit of enabling the two silos granted under planning reference P/2022/0765 to be repurposed as feedstock storage for the proposed Low Carbon CHP Facility, subsequently requiring fewer 'new' feedstock storage facilities for the proposed Low Carbon CHP Facility. Further details are provided below 'Existing Components to be Relocated (Component ID 5 – Chip Screening Facility)' and **Section 3.3** of **ES Chapter 3.0 (Alternatives)**.
- The height of the stack is determined by air quality dispersion modelling (see **Appendix 6C** (Methodology) and **Appendix 6D** (Results – Human Health). The stack height was set at a precautionary height of 95m at the outset of the design

(to inform the EIA Scoping Report (**Appendix 1C**)). Further analysis was subsequently undertaken with the height of this stack being determined by running the air quality dispersion model for a range of stack heights and identifying the point at which there is a diminished reduction in ground level concentration (of oxides of nitrogen) with increased stack height. A stack height of 75m is the point at which increasing the height of the stack further has a diminished reduction in ground level concentration; as such, a height of 75m is concluded to be the appropriate stack height for the proposed Low Carbon CHP Facility. See **Section 3.3** of **ES Chapter 3.0 (Alternatives)** for further details.

- External finish to be finished in goosewing grey cladding to match surrounding energy infrastructure and other structures on the existing Kronospan Facility.
    - To examine the potential implications of substituting different cladding colours on the proposed CHP Building at the proposed Kronospan Low Carbon CHP Facility, a Colour Study (see **Appendix 3A**) has been undertaken. See **Section 3.4** of **ES Chapter 3.0 (Alternatives)** for further details.
- A Framework Construction Environmental Management Plan (CEMP) (**DNS4-003**) has been provided with the DNS application and would be implemented for the construction phase of the Proposed Development. The Framework CEMP sets out how environmental issues would be managed in accordance with relevant legislation, regulations and best practice guidance. It would be the responsibility of the Principal Contractor (PC) to further develop and enforce the CEMP documents. Further detail about the Framework CEMP is provided towards the end of this chapter.
- A Construction Traffic Management Plan (CTMP) will be prepared to ensure that suitable mitigation measures are adopted to manage any adverse effects of construction traffic. The CTMP would be produced post-consent and would form part of the CEMP suite of documents. The CTMP will include the following matters and associated details:
    - Construction phasing and timescales.
    - Classified vehicle volumes by phase.
    - Restrictions on vehicle delivery hours.
    - On-site construction vehicle parking and manoeuvring arrangements.
    - Heavy Goods Vehicle (HGV) routing strategy.
    - Staff parking arrangements.

  - Management and procedures for access by abnormal loads (although none are anticipated).
  - Local signage strategy.
  - Storage of materials.
  - Construction noise management.
  - Construction dust management.
- The decommissioning phase will be supported by a Decommissioning Environmental Management Plan (DEMP) which will include measures similar to those proposed as part of the CEMP.
- A Dust Management Plan (DMP) and Odour Management Plan (OMP) are in place for the existing Kronospan Facility, which have been developed in line with the requirements of Natural Resources Wales (NRW) and include details of the management procedures, mitigation measures, monitoring, reporting, actions and identified improvements and a timeline for implementation. These management plans will be revised to allow for the proposed Low Carbon CHP Facility.

4.4.5 Further details of all alternatives considered (to the Proposed Development) are provided at **ES Chapter 3.0 (Alternatives)**.

4.5 The CHP Process

Combustion

4.5.1 The feedstock would be fed into the combustion chamber which would be equipped with a dosing bin, rotary valves, spreader stokers and a travelling grate which would form the basis for a highly effective and efficient combustion process. The travelling grate movement turns and mixes the feedstock along the surface of the grate to ensure that all biomass is exposed to the combustion process. A proposed blow line (between the existing chip silos and the proposed Low Carbon CHP Facility boiler building) would enable wood dust originating from onsite processes to be fired directly into the combustion chamber.

4.5.2 A start up and support burner would be positioned on one of the sidewalls in the lower part of the furnace and used during start up. This would also be used as an auxiliary combustion system if required. The start-up burners (which typically operate for 10-20 hours during a start-up event) are likely to be fuelled by diesel or low sulphur gas oil. There should be only two start-ups per year after planned maintenance activities. After the start-up period, the feedstock would continually combust without any auxiliary fuel.

4.5.3 A control system would optimise the quantity of biomass added to the furnace and the combustion rate. The temperature in the furnace would be continuously monitored and recorded to ensure the flue gasses are retained at a minimum temperature of 850 degrees Celsius for a minimum of two seconds to meet the requirements set down in the IED, which would be reflected in the Environmental Permit.

Energy Recovery

4.5.4 The proposed boiler would be a single drum steam boiler. The hot flue gases from the furnace would be piped to the boiler where they would convert water into steam. The superheated steam would then drive the high-efficiency reaction steam turbine generator (STG) to produce electricity.

4.5.5 The exhaust steam from the STG would be condensed in the ACC equipped with several variable speed fans for air flow control. The condensate would be recirculated and reused in the boiler. The exhaust steam would also be used in the MDF2 refining process and/or passed through a heat exchanger to increase the temperature of the flue gases in the MDF2 dryer.

4.5.6 Similar to the existing K7 and K8 Biomass Plants, the combustion exhaust gases would be re-directed to the MDF facilities to the south of the proposed Low Carbon CHP Facility and used directly for MDF2 manufacturing processes (also MDF1 in the event that MDF2 is offline). Combustion gases would be used in the MDF2 dryer for direct drying purposes; the combustion gases would be released through the MDF2 cyclones.

Flue Gas Treatment

4.5.7 Having passed through the boiler system, the flue gases generated during the combustion process would be cleaned and directed for use in the MDF2 dryer (they would only be released into the atmosphere via the ID fan and the emergency stack in the event both MDF1 and MDF2 are offline). The following flue gas cleaning systems will be included as part of the proposed design:

- Selective Catalytic Reduction (SCR) system for nitrogen oxide (NOx) reduction.
    - After dust removal, the flue gas would pass through a catalyst system used to reduce nitrogen oxides.
    - A small amount of ammonia solution would be injected before the catalyst; this would react with NOx to form nitrogen and water vapor.
    - This would achieve very low NOx emissions using a proven, widely accepted technology.
- Bag filter for particulate reduction.
    - The bag filter is the primary dust removal system.
    - Flue gas would pass through rows of fabric filter bags that would trap fine particles, including ash, unreacted powder, and reaction products.
    - The system would continuously clean itself, collecting the dust in hoppers positioned underneath.
    - All collected material would be transported to a sealed storage silo for safe handling and disposal.
    - This would ensure very low particulate emissions, typically far below permitted levels.
- Adsorbent injection (before filter) for acid gas reduction.
    - A fine powder (lime) would be injected into the flue gas.
    - This powder would react with acid gases such as hydrogen chloride (HCl) and sulphur dioxide (SO_2).
    - This would neutralise acid pollutants to ensure they can be safely captured.

4.5.8 FGT residues comprise fine particles of ash and residue from the flue gas treatment process. Due to the alkaline nature of the FGT residues, they are classified as hazardous waste (in much the same way as cement). Based on the expected throughput of the proposed Low Carbon CHP Facility (maximum throughput of 293,000 TPA), FGT residues are expected to constitute approximately 6,672 TPA.

4.5.9 The FGT residues would be temporarily stored on site within a sealed silo positioned behind the north elevation of the proposed (boiler building) backup feedstock loading area. The residues would periodically be transported for off-site (licensed) disposal at Whitemoss Landfill, Skelmersdale (operated by Veolia) as are FGT residues from the existing operational K7 and K8 Biomass Plants.

Bottom Ash

4.5.10 Bottom ash is the burnt-out residue from the combustion process. The ash would be quenched with water as it leaves the combustion chamber to both cool the ash and reduce the potential for fugitive dust to be released. Any water not vapourised in the quenching process would be collected and recycled for continued use in the quenching process. Based on the expected throughput of the proposed Low Carbon CHP Facility (maximum throughput of 293,000 TPA), bottom ash residue is expected to constitute approximately 5,424 TPA.

4.5.11 The bottom ash would be stored in an ash pit positioned behind the north elevation of the proposed boiler building. The bottom ash would then be transported to the off-site (licensed) disposal at Whitemoss Landfill, Skelmersdale (operated by Veolia).

Stack

4.5.12 Under normal operations, the exhaust gases from the proposed Low Carbon CHP Facility would be used in the drying process. However, if the MDF driers are offline and the proposed Low Carbon CHP Facility was online, the (cleaned) flue gases would need to vent to atmosphere via a dedicated stack.

4.5.13 Emissions from the proposed Low Carbon CHP Facility would be continuously monitored by an automatic computerised system and reported in accordance with NRW requirements for the operation of the proposed Low Carbon CHP Facility (via a variation to Kronospan's existing Environmental Permit). These would be monitored prior to the emissions either going to the MDF dryers or the dedicated stack.

4.5.14 The height of the stack would be 75m and is determined by dispersion modelling. See bullet point 5 of Paragraph 4.4.4 above and **Section 3.3, ES Chapter 3.0 (Alternatives)** for further details regarding the reduction of the stack height via the design and assessment process.

Heat and Power Use

Overview

4.5.15 The proposed Low Carbon CHP Facility would have an electricity generating capacity of 40 MW. The proposed electrical system of the proposed Low Carbon CHP Facility would include 11kV switchgear and transformers to enable it to connect to Kronospan's existing 11kV network.

4.5.16 It is proposed that electricity generated by the proposed Low Carbon CHP Facility would be used to power on-site operations. Electricity would only be exported to the grid where on-site electricity demand is lower than electrical output (similar to how the existing gas engines operate) and is expected to be infrequent.

4.5.17 As set out above, the proposed Low Carbon CHP Facility would also provide heat to the manufacturing process both in terms of superheated steam and the combustion gasses. In this regard the proposed Low Carbon CHP Facility would be highly efficient, unlike the majority of other large-scale biomass and waste combustion facilities which do not have heat users connected and therefore only generate electricity, with the excess heat lost to the atmosphere.

Potential for Community Heat Benefits

4.5.18 The potential to provide community heat by supplying low-grade waste heat from the proposed Low Carbon CHP Facility to nearby facilities such as a school, swimming pool, or care home has been explored by Kronospan. As part of this work, the likely heat demand, temperature needs, and operating patterns of these potential receivers was examined to understand whether the available heat could offer a practical and sustainable supply.

4.5.19 The technical feasibility of transferring heat over an approximate distance of 500–800m using a district-heating-style buried pipe network has been explored by Kronospan. This included initial consideration of route options, connection points and expected heat losses. The findings were shared with WCBC who chose not to take the opportunity forward at this time.

4.5.20 Whilst community heat benefits are not part of the proposed Low Carbon CHP Facility, their potential has been explored and could be revisited in the future.

Carbon Capture and Storage

4.5.21 The proposed Low Carbon CHP Facility would combust waste wood from the Site that originates from biological sources. As such it primarily produces biogenic CO_2 emissions. Biogenic sources of CO_2 are part of the natural short-term carbon cycle where CO_2 is absorbed by plants during photosynthesis and released upon respiration or decomposition. Therefore, releasing the biogenic CO_2 to the atmosphere would not increase the net carbon emissions in the atmosphere unlike non-biogenic sources (such as natural gas) which introduce carbon emissions which have been locked away for millions of years altering the natural atmospheric carbon balance. As set out in **ES Chapter 9.0 (Climate Change)**, the Proposed Development would result in a net reduction in carbon emissions. The addition of Carbon Capture and Storage (CCS) to the proposed Low Carbon CHP Facility would prevent CO_2 emissions from biogenic and non-biogenic sources emissions from being emitted to atmosphere increasing the carbon benefits of the Proposed Development.

4.5.22 The feasibility of CCS has been explored by Kronospan. Space is the critical limiting factor; the limits of the existing Kronospan Facility are already well established, fixed, and constrained by neighbouring development and established physical features (acknowledging the future North Access Road development would effectively extend the northern boundary further north to accommodate the new access road and 132kV substation). Due to the size of CCS plant and associated footprint likely required, it is likely that an area the size of the entirety of the existing log yard (open wood storage area) would be required; an alternative would be to use the former golf course immediately west of the railway line (either to accommodate the CCS facility or to accommodate (displaced) existing plant/work areas (such as the existing log yard)). An incursion of this size and scale into what is currently undeveloped land designated as Green Barrier (under Unitary Development Plan (UDP) Policy EC1) would provide a further and notable layer of planning complexity given the Proposed Development is complex in nature but currently wholly within the boundary of the existing Kronospan Facility.

4.5.23 The inclusion of a CCS plant would result in additional power (electricity) requirements; this would require the running of additional gas engines or the use of existing Gas Turbines 1 and 2 and/or Gas Engines 1 – 3 (which are planned for decommissioning/removal and standby status respectively as part of the Proposed Development), subsequently losing a notable proportion of the carbon benefit summarised in **Section 4.3** above. Whilst a possible solution to additional power (electrical) requirements would be to construct a CHP facility with a larger electrical output, this would require a much larger CHP facility which was explored by Kronospan in 2022 as part of the early site search exercise (see **Section 3.2, ES Chapter 3.0 (Alternatives)**); that early site search exercise confirmed that a larger CHP facility would be required to be sited on land currently used for open wood storage (instead of the Proposed Development Site) which would subsequently have a detrimental impact on day-to-day operations as well as result in greater amenity (landscape, visual, noise) effects.

4.5.24 As set out in Vision 2030, Kronospan is committed to Net Zero and would like to achieve a carbon negative facility where it is achievable and practicable to do so. It is expected that, over time, CCS technology improvements will be made in terms of size and scale, and CCS opportunities will be fully explored in the future where it can be demonstrated that it is feasible within the physical limitations of the existing Kronospan Facility. Kronospan's intention is to integrate a practicable CCS solution within the existing Kronospan Facility as the final part of its Net Zero/carbon negative approach, rather than as an easy, but likely sub-optimal solution at the start.

Electrical Charging

4.5.25 There are four Electric Vehicle (EV) chargers on the existing Kronospan car park with an additional ten EV chargers being installed in Q1 2026. 10% of the car parking space for the proposed weighbridge car park (as part of the proposed North Access Road development) would also be installed. As such, the EV facilities would be able to be 110% renewable. In addition, 90% of the forklift truck fleet is already electric (as per Kronospan Vision 2025 – see **Section 3.3** of the Planning Statement (**DNS4-001**).

4.6 Feedstock

How Wood Residues are Currently Derived on the Existing Kronospan Facility

4.6.1 Wood residues at the existing Kronospan Facility are currently derived from two main sources: external recycled wood; and internal manufacturing process.

External Sources

4.6.2 Kronospan has established networks to collect discarded wood-based materials, which form the primary input for many of its panel products as follows:

- **Post-consumer waste:** This includes end-of-life domestic furniture and pallets collected from local authority recycling centres and other suppliers.
- **Pre-consumer waste:** This involves by-products and discarded wood from other industries, such as furniture producers who cannot use the material themselves.
- **Collection and Processing:** The collected material is transported to the existing Kronospan Facility (or a primary cleaning facility first), where it undergoes advanced cleaning processes using equipment like cleaning towers, photocells, crushers, and screens to remove contaminants such as metal, stones, and plastics. The clean wood chips are then graded by size for different layers in the final panel product.

Internal Sources

4.6.3 Wood residues are also generated and captured within Kronospan's own manufacturing processes as follows:

- **Sawmill residues:** The on-site sawmill produces residues like sawdust, wood chips, and cut edges.
- **Production byproducts:** Other internal waste includes wood dust and offcuts from panel production.
- **Utilisation:** These internal residues are either reintegrated into the production of new wood panels or used as fuel in the K7 and K8 Biomass Plants to generate heat for use on-site, contributing to a zero-waste economy goal.

Proposed Feedstock – Sourced from On-Site Processes

4.6.4 **Table 4.3** below provides details of the proposed Low Carbon CHP Facility feedstock that is proposed to be generated from existing on-site process wood residues.

Table 4.3 – Proposed Feedstock Configuration (existing on-site processes)

Type/Source	Proposed (Annual) Quantity
Source A - Existing On-Site Process Residues Currently Sold Off-Site On-site process residues currently sold off-site (to be diverted to the proposed Low Carbon CHP Facility). • Bark from the MDF chipper and sawmill debarking process. • MDF process residues.	2021 – 83,577 TPA 2022 – 77,495 TPA 2023 – 69,990 TPA **2021-2023 Average – 76,991 TPA**
Source B – Operational Status of Existing K7 Biomass Plant Currently processes approximately 70,000 TPA of virgin and exempt biomass – sourced via unsuitable material arising from the core on-site business of board production (roundwood logs, wood chip, sawmill off-cuts, sawmill bark, and sawmill sawdust) that is not suitable for board production.	K7 Biomass Plant would remain in situ but be used as a back-up (for when the proposed Low Carbon CHP Facility and the existing K8 Biomass Plant have their annual shutdowns) – fuel currently used in the K7 Biomass Plant would be diverted to the proposed Low Carbon CHP Facility and exhaust gases used for drying purposes in the MDF2 dryer 2021 – 78,500 TPA 2022 – 74,000 TPA 2023 – 71,500 TPA **2021-2023 Average – 74,667 TPA**

Type/Source	Proposed (Annual) Quantity
Source C - Other On-Site Process Residues Extraction of smaller fractions of recycled timber or fines from the existing PB process. This fraction often contains the most impurities and gives the PB no structural properties. Removing it adds significant quality improvements to the PB.	Based on the 2021 - 2023 processing data, the following wood residue would have been created from the enhanced PB manufacturing process: 2021 – 118,184 TPA 2022 – 104,853 TPA 2023 – 102,328 TPA **2021-2023 Average – 108,455 TPA**
TOTAL	260,113 TPA (based on 2021-2023 average)

4.6.5 As set out in **Table 4.3** above, it is proposed that 260,113 TPA of the 293,000 TPA throughput capacity would be generated by existing on-site process residues. This means that the vast majority (88.8%) of the proposed feedstock would be sourced from on-site processes.

How the 'Remainder' would be Met

Overview

4.6.6 Based on the likely availability of feedstock that can be generated on-site (based on an average taken from the calendar years 2021, 2022, and 2023 – see **Table 4.3**), there would be a 'remainder' of 32,887 TPA of biomass feedstock required; this is based on attaining the maximum throughput of the proposed Low Carbon CHP Facility of 293,000 TPA.

4.6.7 The feedstock 'remainder' would be made up as follows:

- 50% (16,444 TPA) - **The import of forestry brash** for direct use in the proposed Low Carbon CHP Facility.

- 25% (8,222 TPA) - **The import of Grade C waste wood*** for direct use in the proposed Low Carbon CHP Facility.
- 25% (8,222 TPA) - **Increased on-site production** that would generate further on-site process residues for direct use in the proposed Low Carbon CHP Facility.

4.6.8 *Grade C wood is a mix of waste wood, including panel products and wood treated with preservatives. Whilst not suitable for traditional recycling, it can be used in biomass fuel applications.

4.6.9 The feedstock 'remainder' scenario set out above is considered feasible and reasonable and forms the basis of the feedstock assumptions considered as part of the ES. However, the Applicant would retain the flexibility to apply different percentages to the above depending on the actual feedstock 'remainder' in any given year and the availability/market conditions of the different types of feedstock. Increasing on-site production (to generate further on-site process residues) would likely be the Applicant's priority given this would be more sustainable, more cost effective, and could occur under their existing manufacturing conditions and existing Environmental Permit restrictions.

4.6.10 The feedstock 'remainder' scenario set out above would increase the feedstock that could be generated on-site from 88.8% (260,113 TPA) to 91.6% (268,335 TPA). As stated above, depending on market factors and material available on site, there is the potential for 100% of the feedstock to be generated on-site.

The Import of Forestry Brash and Grade C Waste Wood

4.6.11 Approximately 16,444 TPA of forestry brash and approximately 8,222 TPA of Grade C waste wood would be imported for direct use in the proposed Low Carbon CHP Facility. The forestry brash and Grade C waste wood would be transported to Site via HGV.

4.6.12 Further details of the likely availability and geographical origins of the forestry brash and Grade C waste wood are provided at **Section 4.0** of the Planning Statement (**DNS4-001**).

Increased On-Site Production

4.6.13 Kronospan, as all other UK businesses, is seeking economic growth whilst keeping up with technological advances that will naturally drive on-site efficiency and effectiveness. The policy aims and objectives of the new UK Labour Government seek to do the same i.e. stimulate economic growth, with particular focus on the development sector. With economic growth comes an increase in housebuilding (including an increase in more energy efficient homes) and growth in other general industrial and development sectors, which are Kronospan's key markets. It is on this basis that Kronospan is expecting manufacturing capacity at the Site to increase, which would result in a subsequent increase in on-site wood process residues.

4.6.14 To deliver the increased level of board production, there would be a requirement for an increased import of Grade B and Grade C waste wood to the existing Kronospan Facility. The quantity of increased Grade B and Grade C waste wood required would be 41,109 TPA (based on the 2021-2023 average); the consequential increase in process residues is based a percentage rate of 20% arisings from the raw material/primary process.

4.6.15 Further details of the likely availability and geographical origins of the Grade B and Grade C waste wood are provided at **Section 4.0** of the Planning Statement (**DNS4-001**).

Transport Implications

4.6.16 The configuration/sources of the feedstock required for the proposed Low Carbon CHP Facility would result in seven HGV (14 two-way) per operational day (net). The calculations for this are set out at **Appendix 4A**.

4.6.17 Further details of the transport impact of the Proposed Development are provided in the Transport Statement **(DNS4-005).**

Feedstock Delivery, Storage and Handling

4.6.18 As described above, approximately 88.8% of the feedstock would be generated on-site; the remainder would be imported via HGV which would access the Proposed Development Site using the North Access Road to be constructed north of the Proposed Development. After weighing (using the new weighbridges proposed as part of the North Access Road planning application), the HGVs would proceed on the internal road network towards the Proposed Development Site. After unloading, the HGVs would then exit the Proposed Development Site in a similar (but reverse) manner to the means of access, through the new weighbridges and back onto Holyhead Road (B5070) via the North Access Road.

4.6.19 The feedstock would be unloaded into dedicated screening facilities which would remove materials in the feedstock unsuitable for combustion (such as metals). The screened feedstock would then be transported to storage facilities via overhead conveyor systems. The feedstock would then be transferred to the proposed boiler building via an overhead conveyer system.

4.6.20 The proposed Low Carbon CHP Facility feedstock generated on-site originates from existing screening processes and would be conveyed to the same (proposed) dedicated screening facilities (as required) and storage facilities as set out above (for the imported feedstock).

4.7 Access

4.7.1 The existing main site entrance is a T-junction with Holyhead Road (B5070) which runs in a north south direction to the east of the existing Kronospan Facility. The B5070 meets the A5 approximately 1.5km to the north of the existing Kronospan Facility via a roundabout junction, known as Whitehurst Roundabout. Approximately 1km to the east of this roundabout the A5 forms a junction with the A483. The A483/A5 provide links north to Chester, west to Llangollen and south to Shrewsbury. To the south of the manufacturing site, access via the B5070 leads to the A5 via Chirk town centre, this route is restricted to non-HGV traffic.

4.7.2 The existing T-junction main site entrance (T-junction with the B5070) would be used as the main site entrance for the construction phase of the Proposed Development.

4.7.3 Once constructed, the proposed North Access Road would be used as the main access to the existing Kronospan Facility; the current access would no longer be used for the access and egress of all HGVs except in exceptional circumstances. The North Access Road would be used as the main site entrance for the operational phase of the Proposed Development.

4.7.4 The existing railhead and sidings within the existing Kronospan Facility are used to import timber for the manufacturing process (as well as import via HGV). Improved railway siding facilities have been constructed to enable an increased volume of timber to be imported by rail.

4.8 Operating Hours

4.8.1 It is proposed that the Low Carbon CHP Facility would operate on a 24-hour basis. The feedstock would be brought to site primarily between the hours of 07.00 and 19.00 seven days a week, including Bank Holidays but excluding Christmas Day, Boxing Day and New Years Day. Deliveries outside of those hours would be infrequent and are accounted for in the various EIA topic assessments.

4.9 Lighting

4.9.1 Given its position in the middle of the existing Kronospan Facility, the Proposed Development Site would be lit by existing site lighting (refiner building and silos) with no requirement anticipated for additional site lighting.

4.9.2 The Ministry of Defence (MoD) (in its EIA Scoping consultation response dated 20 August 2024) states that aviation safety lighting should be installed on any components that are equal to or greater than 50m in height given the Proposed Development is within Low Flying Area 7 (LFA 7).

4.9.3 The Applicant has sought specialist advice from Wind Farm Low Flying Aviation Consultants Ltd who has reviewed the MoD consultation response and provided a technical briefing note (see **Appendix 4B**) to further advise the Applicant. **Appendix 4B** concludes that the Proposed Development is not within LFA 7 but is within LFA 9 (a dedicated helicopter training area); military aircraft and helicopters are instructed to avoid built up areas (Congested Areas) such as those that the Proposed Development is sited in. As such, **Appendix 4B** recommends that two synchronised MoD specification infra-red lights are installed on the stack to ensure that flight safety would not be compromised.

4.9.4 Infra-red light has longer wavelengths and lower energy than visible light, and as such would not be visible to the human eye. **ES Chapter 7.0 (Landscape and Visual Impact Assessment)** concludes that no night-time landscape and visual effects would occur as a result of infra-red lights.

4.9.5 As per the MoD consultation response, the detailed aviation lighting design is expected to be subject to planning condition.

4.10 Drainage

4.10.1 The Proposed Development would be within Flood Zone 1 and would not result in an increase in impermeable areas. As such there would be no significant impacts during operation in relation to flooding and drainage.

4.10.2 Surface water run-off and effluent is currently collected in site drainage systems. The surface water drainage systems are discharged through the inlet to the lagoons which is an oil interceptor in the first chamber prior to discharge to the Afon Bradley via valve Penstock A. The discharge from the on-site lagoons is regulated by the Environmental Permit. Surface water from the rail sidings is either transferred to the canal water treatment plant, or during abnormal operations discharged into the on-site lagoons. Process effluents from the manufacturing process are collected in the site foul water drainage systems prior to discharge to sewer.

4.10.3 Discharges from the Proposed Development would be managed via the existing drainage systems described above and in accordance with the existing Environmental Permit.

4.11 Utilities

4.11.1 All utilities would be connected into existing on-site infrastructure, all of which has available capacity.

4.11.2 The proposed Low Carbon CHP Facility would require a connection to the existing telecommunications network at Kronospan; this would be the existing network from the north of Kronoplus.

4.12 Employment

4.12.1 The Proposed Development is expected to generate approximately 20 permanent full time equivalent (FTE) posts.

4.13 Existing Components to be Removed to Facilitate the Proposed Low Carbon CHP Facility

4.13.1 The following (existing) components (Component ID 1 – 4) would be removed to facilitate the proposed Low Carbon CHP Facility (all components are shown in green on the drawing provided at **DNS3-002**):

- **Component ID 1 - Gas Turbines 1 and 2**. Gas Turbines 1 and 2 are on the footprint of the proposed Low Carbon CHP Facility (at the southern extent of the Proposed Development Site) and would be removed. See **Table 4.2** for further details.
- **Component ID 2 – Redundant Steelwork**. Immediately north of the existing refiner building (at the western extent of the Proposed Development Site) is a small section of redundant steelwork (that previously supported a (now removed) section of overhead conveyors) and would be removed.
- **Component ID 3 – Redundant Manual Loading and Conveyor System**. Immediately north of the existing chip and Recycled Timber (RCT) silos (at the northern extent of the Proposed Development Site) is a redundant manual loading (bark and chips) and conveyor system which provides a connection to the wider (existing) conveyor system. This manual loading and conveyor system is on the footprint of the proposed Low Carbon CHP Facility feedstock silos and would be removed.
- **Component ID 4 – Materials Reception Building**. Approximately 30m east of the existing RCT silos is a materials reception building for Recycled Wood Fibre (RCF) which forms part of an existing RCF Pre-Screening Facility. The RCF materials reception building is no longer required and would be removed. One of the two proposed CHP feedstock screening facilities would be constructed on the footprint of the (to be removed) RCF materials reception building. The CHP feedstock would be transported (after screening) via the proposed overhead conveyor system to the two proposed CHP feedstock silos for storage.

4.14 Existing Components to be Relocated to Facilitate the Proposed Low Carbon CHP Facility

4.14.1 The following (existing) component (Component ID 5) would be removed, retained on Site, and relocated to facilitate the proposed Low Carbon CHP Facility (Component ID 5 is shown in its existing position in blue on the drawing provided at **DNS3-002** and its new position in blue on the drawing provided at **DNS3-003**):

- **Component ID 5 – Chip Screening Facility**. The existing chip screening facility is on the footprint of the proposed overhead conveyor system (between the proposed CHP feedstock silos and the proposed CHP boiler building). Therefore, the existing chip screening facility would be removed, retained, and relocated to the eastern extent of the Proposed Development Site (immediately south of the second of the two proposed CHP feedstock screening facilities). Currently, the (unscreened) chips are stored in the existing chip silos, then transported to the roll screens (chip screening facility) for screening, before onward transportation via overhead conveyor to the existing refiner building. Once the chip screening facility is relocated, the chips would be screened first, then transported (via a new overhead conveyor system) and stored in the existing chip silos, before onward transportation to the existing refiner building via the replacement overhead conveyor system (the latter is described at Component ID 6 below).

4.14.2 The main benefits of the above are:

- The existing chip silos would be used more efficiently and able to store a significantly greater quantity of usable chips for subsequent manufacturing.
- The above would allow the proposed (two) larger silos granted under planning permission reference P/2022/0765 to be repurposed for the proposed Low Carbon CHP Facility.
- Subsequently, only one ‘new’ feedstock storage facility (using the premise that the two larger silos already have planning permission) would be required to provide sufficient feedstock storage for the proposed Low Carbon CHP Facility; this would be smaller in height than, and positioned east of, the existing chip silos.

- The above would have subsequent benefits with respect reduced landscape and visual impact, and the use of raw materials and associated carbon footprint.

4.14.3 As the silos consented under planning reference P/2022/0765 are in a slightly different position than the silos proposed as part of the proposed Low Carbon CHP Facility, an amendment to planning permission P/2022/0765 will be sought (should this DNS application be consented) to formalise the arrangement in planning terms.

4.15 Replacement Components to Facilitate the Proposed Low Carbon CHP Facility

4.15.1 The following (existing) component (Component ID 6) would be removed, and new (replacement) components constructed in a different part of the Site to facilitate the proposed Low Carbon CHP Facility. Component ID 6 is shown in its existing position in purple on the drawing provided at **DNS3-002** and in its new position in purple on the drawing provided at **DNS3-003**):

- **Component ID 6 – Transportation System between Existing Chip Silos and Existing Refiner Building**. The existing (chip) overhead conveyor system (between the existing chip silos and the existing refiner building) is on the footprint of the proposed CHP boiler building. Therefore, the existing (chip) overhead conveyor system would be removed, and a new (replacement) overhead conveyor system (approximately 95m in length) would be constructed immediately north of, and then immediately west of the proposed CHP boiler building. The current process for chip transportation is described above (Component ID 5). A new bucket elevator system would be constructed immediately west of the existing chip silos; this would enable the chips to be raised to a suitable height for onward transportation to the existing refiner building via the replacement overhead conveyor system.

4.16 New Components to Facilitate the Proposed Low Carbon CHP Facility

4.16.1 Due to the proposed relocated and replacement components (see Component ID 5 and 6 above), there is a requirement for an extension to the existing (chip) overhead conveyor system to facilitate the transportation of chips to and from the (repositioned) chip screening facility.

4.16.2 A new 18m long overhead conveyor would be constructed in a south westerly direction to transport unloaded (and unscreened) chips at ground level to the repositioned chip screening facility.

4.16.3 A new 75m long overhead conveyor would be constructed in a westerly direction to transport screened chips between the (repositioned) chip screening facility and the existing conveyor system for onward transportation to the existing chip silos.

4.17 Construction Methods

Introduction

4.17.1 The following section provides a summary of the key elements of the construction of the Proposed Development. This description is not intended to be prescriptive and the exact construction methods, phasing and programme would be determined by the appointed designers and contractors. However, the following description enables the principal construction phases and methods to be understood for the purposes of understanding the likely significant environmental effects of the Proposed Development.

Construction Programme and Phasing

4.17.2 The timing of all construction activity would be dependent on the grant of permission for the Proposed Development and subsequent contract negotiations. At present, it is anticipated that construction would occur between Quarter 1 2027 and Quarter 2 2029.

4.17.3 An indicative construction programme setting out the key (but not all) construction activities is provided at **Inset 4.3** below.

Inset 4.3 – Indicative Construction Programme

Activity	Est. Duration (Days)	Est. Constr. Employees	2027				2028				2029			
			Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Relocation of Existing Assets	90	20	■											
Civil and Piling works	180	20		■	■									
Construction - Silencer/Stack	45	5				■								
Construction - Water Treatment/Effluent Pit/Ammonia Tank/Lime Silo	60	20				■	■							
Construction - NOx Catalyst	45	10					■							
Construction - Turbine Building	90	25					■	■						
Construction - ID Fan	45	2							■					
Construction - Bag Filter	45	15							■					
Construction - ACC	45	10							■	■				
Construction - Boiler Building/Service Building/Ash Pit	180	25								■	■			
Crane - Liebherr 1450 - 8.1 (450t capacity)						■	■	■	■	■	■			
Commissioning												■		

Construction Hours

4.17.4 Construction operations would generally be limited to 07:30hrs to 18:00hrs Monday to Friday and 08:00hrs to 14:00hrs on Saturday. No construction work is planned on Sundays or Bank Holidays, however there may be occasions when construction would need to be undertaken outside of the core hours, for example, during major concrete pours or the transfer of abnormal loads.

4.17.5 HGV movements would not be permitted outside the hours outlined above without prior agreement from WCBC. These matters would be controlled through the Framework CEMP (**DNS4-003**).

Construction Employment

4.17.6 The (indicative) number of construction personnel anticipated to be working on the Proposed Development Site (up to and including the peak month (months 1 – 10)) is provided at **Inset 4.4** below.

Inset 4.4 – Indicative Construction Personnel (Months 1 – 10)

Personnel	Months 1 - 10									
	1	2	3	4	5	6	7	8	9	10
Supervisors	7	7	7	7	10	14	14	14	16	16
Construction Employees	25	25	35	60	80	150	160	170	210	210
Total	**32**	**32**	**42**	**67**	**90**	**164**	**174**	**184**	**226**	**226**

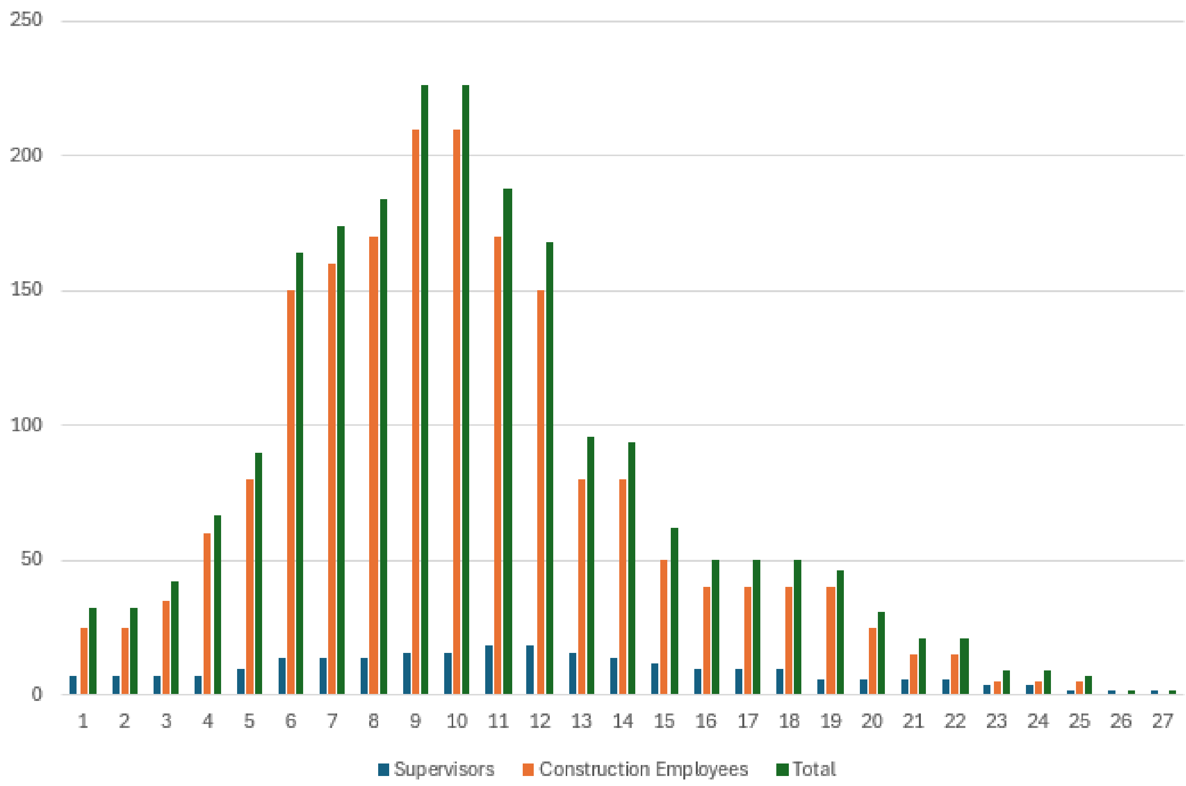
4.17.7 The (indicative) number of construction personnel anticipated to be working on the Proposed Development Site (after the peak month until completion (months 11 – 27)) is provided at **Inset 4.5** below.

Inset 4.5 – Indicative Construction Personnel (Months 11 – 27)

Personnel	Months 11 - 27																
	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Supervisors	18	18	16	14	12	10	10	10	6	6	6	6	4	4	2	2	2
Construction Employees	170	150	80	80	50	40	40	40	40	25	15	15	5	5	5		
Total	**188**	**168**	**96**	**94**	**62**	**50**	**50**	**50**	**46**	**31**	**21**	**21**	**9**	**9**	**7**	**2**	**2**

4.17.8 The (indicative) number of construction personnel anticipated to be working on the Proposed Development Site for the duration of the construction period (months 1 – 27) is illustrated at **Inset 4.6** below.

Inset 4.6 – Indicative Construction Personnel (Months 1 – 27)



Temporary Construction Compound Areas

4.17.9 Vacant (hardstanding) land at the southern extent of the existing Kronospan Facility (on the site of the consented but not yet constructed engineering stores (planning permission P/2022/0615 - further details provided at **Section 1.3, ES Chapter 1.0 (Introduction)**) and (hardstanding) land at and adjacent to the northern extent of the Proposed Development Site would be used as temporary construction compound areas for the Proposed Development. An indicative drawing showing the extent of the proposed temporary construction compound areas is shown on the drawing provided at **Figure 4.1** and is also contained in the Framework CEMP (**DNS4-003**).

4.17.10 A tower crane (maximum boom height 85m) would be used for part of the construction works (likely to be between Quarter 4 2027 and Quarter 1 2029 – see **Inset 4.3**). **Figure 4.2** provides indicative information about a typical crane (Liebherr 1450-8.1) that would be used.

4.17.11 It is expected that the existing Kronospan Facility would be able to remain fully operational, with no adverse effects on the access and egress of HGVs and cars during the construction phase; this has been proven for previous developments (including major planning applications) within the existing Kronospan Facility.

4.17.12 The likely effects of the construction works are assessed within the relevant ES environmental assessment topics. However, it should be noted that construction compounds are permitted development under Schedule 2, Part 4, Class A (Temporary Buildings and Uses) of the Town and Country Planning (General Permitted Development) Order 1995 (as amended) and therefore do not require planning permission in their own right. For this reason, the construction compound areas do not form part of the DNS application; however, as described above, construction phase impacts are included in the ES where relevant.

Construction Lighting

4.17.13 Lighting during construction would need to be sufficient to satisfy health and safety requirements, whilst ensuring impacts on the surrounding environment, including those from sky glow, glare and light spillage, are minimised.

4.17.14 Artificial lighting would only be used during the hours of darkness, low levels of natural light or during specific construction tasks, to ensure the health, safety and welfare of those on site, including construction staff and visitors.

4.17.15 Appropriate lighting would be installed and operated to ensure that:

- Access/egress points are clearly visible during operational hours.
- Staff and visitors can move safely around site.
- Site security can be monitored and maintained.
- Sufficient area lighting is provided for the site office and laydown areas.

4.17.16 This would involve the installation of fixed lighting columns and the use of mobile task lighting.

4.17.17 Fixed lighting installations (columns) would typically be around the outer edge of the main construction zones and the compound/laydown areas. The luminaires would be mounted as low as possible to facilitate safe working.

4.17.18 Mobile lighting would be used to supplement column lighting and provide the additional lighting necessary to satisfy health and safety requirements. Mobile lighting would be mounted on telescopic poles.

4.17.19 Further details of the proposed approach to construction lighting are set out in the Framework CEMP (**DNS4-003**).

Construction Plant

4.17.20 The following items are anticipated to be the principal elements of plant used during construction:

- Tracked excavators (excavation and loading.
- Articulated dump trucks.
- Low-loader trailers.
- Wheeled backhoe loader.
- HGV wagons.
- Mobiles tower crane and telescopic handlers.
- Rollers and vibratory compactors.
- Generators and water pumps.
- Concrete batching plant and pumps; and cement mixer trucks.

Construction Environmental Management Plan

Overview

4.17.21 A Framework CEMP (**DNS4-003**) has been provided with the DNS application and would be implemented for the construction phase of the Proposed Development. The Framework CEMP provides an overarching framework to be applied to all phases of the development.

4.17.22 A series of phase specific CEMP documents (as required) which define specific measures to be adopted during the construction of the various components of the Proposed Development would be produced (post-consent) by the PC and form part of the CEMP. The CEMP would become a ‘live’ document, updated as required during the construction phase and managed by the PC.

4.17.23 The purpose of the Framework CEMP is to manage and report environmental effects of the Proposed Development during construction. The Framework CEMP sets out how environmental issues would be managed in accordance with relevant legislation, regulations and best practice guidance. It would be the responsibility of the PC to further develop and enforce the CEMP documents.

4.17.24 The objectives of the Framework CEMP are to:

- Provide a mechanism for ensuring the delivery of mitigation measures to reduce environmental effects identified in the DNS application documents.
- Provide an outline of the content that will be supplied in the additional plans to be provided upon the appointment of the PC.
- Ensure compliance with legislation and identify where it will be necessary to obtain authorisation from relevant statutory bodies.
- Provide a framework for compliance auditing and inspection to ensure the agreed environmental aims are being met.
- Ensure a prompt response to any non-compliance with legislative and planning permission requirements, including reporting, remediation and any additional mitigation measures required to prevent a recurrence.

Structure

4.17.25 The structure of the Framework CEMP is a s follows:

- Introduction
    - The Proposed Development
    - Purpose of the Framework CEMP
    - Objectives
    - Management Plans to be Provided by the Appointed PC
    - Conformance with Corporate and Project Environmental Management Systems
    - Community Engagement and Public Information
    - Inspections
    - Incident Procedure
- General Site Operations
    - Objective

  - Health and Safety
  - Construction Hours
  - Construction Site Layout and Appearance
  - Fencing and other Means of Enclosure
  - Lighting
  - Waste Management
  - Security
  - Welfare
  - Pest Control
- Environmental Management and Construction Principles
  - Noise and Vibration
  - Air Quality and Odour
  - Climate Change
  - Geology, Hydrogeology, Hydrology and Contaminated Land
  - The Water Environment
  - Transport

Decommissioning

4.17.26 The decommissioning phase will be supported by a DEMP which will include measures similar to those proposed as part of the CEMP. The DEMP is expected to be secured via planning condition.

4.18 Biodiversity Mitigation and Enhancement

4.18.1 The Biodiversity Assessment Report (BAR) (**DNS4-007**) confirms that the air quality impacts of the Proposed Development would be unlikely affect the special features of Chirk Castle Site of Special Scientific Interest (SSSI) or result in an unacceptable level of harm to Canal Wood Local Wildlife Site (LWS). Nevertheless, there would be low magnitude impacts above the screening thresholds for both of these designations, and targeted off-site mitigation and enhancement measures are therefore proposed.

4.18.2 The priorities are to align with legislative and policy objectives, and in particular with the DECCA framework as described in paragraph 6.4.5 of Planning Policy Wales (PPW), with the over-arching aim to maintain ecosystem resilience. To provide an environmental enhancement, over and above the need for mitigation, ecosystem resilience needs to be improved relative to the current baseline conditions.

4.18.3 In the specific context of Chirk Castle SSSI and Canal Wood LWS, measures are targeted at maintaining and enhancing the integrity and resilience of the woodland habitat feature. The primary aim of mitigation measures is to protect against impacts of atmospheric nutrient pollution. However, enhancement measures are aimed at delivering wider benefits within the DECCA framework, such as improved habitat connectivity.

4.18.4 The mitigation and enhancement measures forming part of the Proposed Development (and illustrated on **Drawing DNS3-012**) comprise the following:

- New woodland planting is proposed adjacent to the north-western part of Canal Wood LWS, onto what is currently a former golf course, now agricultural grassland.
- New woodland planting is proposed along the eastern boundary of Chirk Castle SSSI, also within the former golf course.

4.18.5 In both cases, the proposed planting is intended to buffer local pollution sources (e.g. emissions from fertilisers and livestock) - initially by removing adjoining land from agricultural management, then as trees become established, via interception of pollutants.

4.18.6 Both locations are within land under the control of the Applicant and thus can be delivered without the need for any agreement with third parties.

4.18.7 Key principles followed in the design of the proposed woodland planting are:

- Shelterbelts for buffering should ideally be 30-50m wide.
- They should form a continuous barrier, rather than groups of trees separated by gaps.
- The aim should be to achieve (once established) a range of tree and shrub heights, including a well-developed understorey and shrub layer.

- Notwithstanding point iii), planting should not be too dense so as to impede airflow into the shelterbelt when established (this point is emphasised in guidance for shelterbelts around intensive agricultural units) - there is an optimum leaf area density for infiltration and deposition of pollutants.
- Where the buffer is necessarily less than 30m wide, a greater foliage density is recommended.
- Species choice should include trees with complex leaf shapes (e.g. field maple, Acer campestre) and include an evergreen component (e.g. holly, *Ilex aquifolium* and Scots pine, *Pinus sylvestris*) to maintain effective capture through the year.
- For gaseous pollutant interception, anisohydric species which keep stomata open for longer in dry conditions may be more effective - these include oak (*Quercus*) and poplar (*Populus*) species.

4.18.8 The proposals shown indicatively on Drawing **DNS3-012** reflect these principles. Should consent be granted for the Proposed Development, it is envisaged that full details of the proposal would need to be agreed with WCBC. A Management Plan for the proposed woodland planting would be prepared by the Applicant which would include details of implementation and establishment management, and long-term management and maintenance measures.

Appendix 4A – Feedstock and Transport Calculations

Appendix 4B – Proposed CHP Stack: Lighting Report