CAS-03463-R2W9C2 - Kronospan Low Carbon CHP Facility

Supporting Document 2

Design and Access Statement

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DNS4-002

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Well House Barns, Chester Road, Bretton, Chester, CH4 0DH
1st Floor, Barfield House, Alderley Road, Wilmslow, SK9 1PL
Maling Exchange, Studio 307, Hoults Yard, Walker Road, Newcastle Upon Tyne, NE6 2HL

T: 0344 8700 007
enquiries@axis.co.uk
www.axis.co.uk

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1.0 INTRODUCTION

1.1 Introduction

1.1.1 This Design and Access Statement (DAS) has been prepared to accompany a Development of National Significance (DNS) application under Section 62D of the Town and Country Planning Act 1990 made by Kronospan Limited (the Applicant) for the construction and operation of a Low Carbon Combined Heat and Power (CHP) Facility (the Proposed Development) on land at the existing Kronospan Facility, Chirk, North Wales (the Site).

1.1.2 This document is to be read in conjunction with the Planning Statement (**DNS4-001**) and accompanying Supporting Documents (**DNS4**), DNS Drawings (**DNS3**), and Environment Statement (ES) (**DNS5**) which form part of this DNS application submission.

1.1.3 The statutory requirement to produce a DAS is set out within Article 7 of the Town and Country Planning (Development Management Procedure) (Wales) Order 2012 (see details below). It requires that this application is accompanied by a DAS that sets out the design principles and concepts that have been applied to the development, demonstrates how the development takes context into account, and how issues relating to access to the development have been dealt with.

1.2 Structure of this Design and Access Statement

1.2.1 This DAS is divided into seven sections as follows:

- Section 1.0 provides an introduction to the document.
- Section 2.0 describes the legal background and guidance that underpins the document.
- Section 3.0 describes the Site and its surroundings.
- Section 4.0 provides a summary description of the Proposed Development.
- Section 5.0 describes the need and overarching design principles.
- Section 6.0 describes other design principles.
- Section 7.0 describes access.
- Section 8.0 provides some concise conclusions.

2.0 LEGAL BACKGROUND AND GUIDANCE

2.1 Legislative Requirements

2.1.1 The legal requirement to provide a DAS is set out in Article 7 of the Town and Country Planning (Development Management Procedure) (Wales) Order 2012 (as amended). This is hereafter referred to as the 'DMPO'.

2.1.2 Paragraph 4 of Article 7 requires that a DAS must:

i) explain the design principles and concepts that have been applied to the following aspects of the development:
   a) environmental sustainability;
   b) movement to, from and within the development;
   c) character; and
   d) community safety

ii) demonstrate the steps taken to appraise the context of the development and how the design of the development takes that context into account in relation to its proposed use and each of the aspects specified in sub-paragraph (a);

2.1.3 Paragraph 5 of Article 7 requires that a DAS must, in relation to access, explain:

- The policy or approach adopted as to access and how policies relating to access in the development plan have been taken into account;
- How any specific issues which might affect access to the development have been addressed; and
- How features which ensure access to the development are to be maintained.

2.2 Good Practice Guidance

2.2.1 The Welsh Government has produced good practice guidance (*Design and Access Statements in Wales What Why and How*, 2017) on how good design can be reflected in DAS. Page 5 of the guidance is clear that:

"A DAS communicates what is proposed and demonstrates the design process that has been undertaken to reach the final proposal'

and that

"…It is recommended that a DAS is concise…"

2.2.2 This DAS provides a description of the relevant design and access issues in respect of the Proposed Development. The level of detail provided is considered to be appropriate and proportionate to the nature and complexity of the scheme.

3.0 THE SITE AND SURROUNDINGS

3.1 The Existing Kronospan Facility

3.1.1 The entirety of the existing Kronospan Facility covers an area of approximately 40 hectares (ha), with approximately 14ha of this developed with industrial buildings and plant. Several industrial process facilities are in the western half of the existing Kronospan Facility which are used to process, sort and dry the raw wood materials used in the manufacture of Medium Density Fibreboard (MDF) and Particleboard (PB). These include several tall structures, including stacks, that emit abated process emissions to the atmosphere. The tallest structures within the existing Kronospan Facility are the biomass plant stack which is 70m in height, the SEKA wet electrostatic precipitator (WESP) filter which has a stack height of 65.5m and stack width of approximately 5m, the MDF cyclones (57m high), and the dryer exhaust stack at the WESP Chip Dryer (50m high).

3.1.2 Several process buildings are in the northern half of the existing Kronospan Facility including: a sawmill, formalin plant and the secondary product manufacturing facility (*Kronoplus*) which produces laminate flooring and worktops.

3.1.3 The development of the existing Kronospan Facility is ongoing, reflecting changes in industrial processes and in market conditions. Planning permission has been granted for the following developments which are either recently completed, under construction, or planned to be constructed in the near future:

- An oriented strand board (OSB) Facility (granted 14 August 2019 under appeal reference APP/H6955/A/19/3227571) at the western extent of the existing Kronospan Facility; the OSB Facility is currently under construction.
- A new warehouse building (granted 13 April 2022 under planning reference P/2021/0725) in the north-east part of the existing Kronospan Facility, which will deliver 15,029 sq.m. of floorspace (GEA). This planning permission also includes a new sprinkler tank between the northern extent of *Kronoplus* and the existing Kronospan Facility's northern boundary.
- An extension to the existing main warehouse building to create a covered loading yard and storage area to facilitate site operations (granted 04 July 2022 under planning reference P/2022/0336).

- The erection of a new building to form engineering stores, a dedicated apprentice workshop, an access track around the new structure and ancillary works (granted 07 November 2022 under planning reference P/2022/0615).
- The erection of two raw material silos, extension to the existing chip preparation building, and the erection of three silos and associated works (granted 09 January 2023 under planning reference P/2022/0765).
- A proposed new access road (North Access Road), lorry park, weighbridge, 132kV substation and associated infrastructure on land immediately north of the existing Kronospan Facility (Decision Notice is pending (under planning reference P/2022/1080) subject to confirmation of legal agreements for off-site enhancements).

3.1.4 A draft planning application for a proposed 132kV electrical connection via underground cables between the existing Legacy to Oswestry 132kV overhead line and the proposed Kronospan 132kV substation (the latter included in planning permission P/2022/1080 referenced above) is currently subject to statutory pre-application consultation; the planning application is expected to be submitted to WCBC in Q1 2026.

3.1.5 Surface water for most of the manufacturing site currently drains to two lagoons on the northern boundary of the manufacturing facility, each of 2,033sqm in volume. A third lagoon was constructed to take surface water from the log yard.

3.1.6 An overview of the Proposed Development Site and existing site operations is provided at **ES Figure 1.2**.

3.2 The Proposed Development Site

3.2.1 The Proposed Development Site (see the drawing provided at **DNS3-001**) is at the south-western extent of the existing Kronospan Facility which is predominately characterised by substantial built development. The Site is currently hardstanding and is on the footprint of the existing Gas Turbines 1 and 2. The existing Gas Engines 1 – 3, existing biomass plant stack, existing SEKA WESP filter and the existing dryer exhaust stack at the WESP Chip Dryer are immediately adjacent or very close to the Site. The existing MDF cyclones are approximately 150m to the south of the Site. Existing open wood storage is predominately to the north of the Site.

3.2.2 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). All such components are shown on the drawings provided at **DNS3-002** and **DNS3-003** and described in further detail at **Sections 4.13 – 4.16, ES Chapter 4.0 (Description of the Proposed Development)**.

3.3 Wider Site Context

3.3.1 Chirk is a small town off the A5 and just north of the England-Wales border (within Wales). The residential areas of the town mostly lie east of the B5070, with the existing Kronospan Facility to the west of this road. On the western side of the B5070, to the south-east of the existing Kronospan Facility is an area of greenspace comprising a private sports club (immediately south of the Kronospan car park) and Chirk Recreation Ground. The larger structures within the existing Kronospan Facility are visible from the recreation ground, but other structures are very well screened from view by intervening vegetation cover. Chirk town centre lies south-east of the existing Kronospan Facility and includes various commercial and community buildings and areas of public open space.

3.3.2 The wider area is rural. The landform falls steeply, from the hills to the west towards the much lower-lying Shropshire Plain to the east. Local variations in topography are evident, with a marked rise to a ridge east of the town.

3.3.3 The western perimeter of the existing Kronospan Facility is formed by the Shrewsbury to Chester railway. Further west, the land rises towards the foothills of the Welsh mountains. The Llangollen Canal forms part of the Pontcysyllte Aqueduct and Canal World Heritage Site (WHS). In addition to recognised heritage value, the canal corridor is an important recreational route; water is also abstracted from the canal for use in the Applicant's manufacturing process. Beyond the canal, settlement is sparse, and land cover comprises a mixture of pasture and small woodlands. Chirk Castle and its associated grounds (Grade 1 registered) are a notable feature within the landscape. The Castle is owned by the National Trust and is a well-known and well-frequented visitor destination. The Offa's Dyke Path National Trail runs in a broadly north-south direction further to the west, with views available east over the

lower ground. Much of this area falls with the boundary of the Clwydian Range and Dee Valley Area of Outstanding Natural Beauty (AONB).

3.3.4 A sewerage pumping station and one property, owned by the Applicant, are to the immediate north of the existing Kronospan Facility; immediately north of this is the site of the proposed North Access Road and associated development referred to above. Further north, the land undulates before falling into the steep valley of the River Dee approximately 1.6km north of the existing Kronospan Facility. The canal (WHS) runs due north before turning westwards along the southern lip of the valley. The northern side of the valley is urbanised, with a string of contiguous small villages at Cefn.

3.3.5 The eastern perimeter of the existing Kronospan Facility is formed by Holyhead Road (B5070). An earth bund, planted with trees, has been developed along the eastern perimeter of the existing Kronospan Facility to reduce the visibility of Kronospan operations from neighbouring properties on Holyhead Road (B5070). An undulating agricultural landscape extends east of Chirk. The A5 corridor runs north-south in what is almost a straight line along the eastern edge of a ridge approximately 1km east of the existing Kronospan Facility. The Brynkinallt estate (Registered Park and Garden) is bisected by the road. The wholly separate Brynkinallt Park lies west of the road, at the eastern edge of Chirk, on reclaimed colliery land.

3.3.6 To the immediate south of the existing Kronospan Facility is the Mondelez International factory, the Chirk AAA sports ground and the Chirk recreational ground. Further south, the steep sided valley of the River Ceiriog cuts through the surrounding hills 1.8km to the south of the existing Kronospan Facility. Parts of the valley slopes are well wooded. The Llangollen Canal crosses the valley via the Chirk Aqueduct, which forms part of the WHS. The Ceiriog Trail recreational route runs along the southern lip of the valley.

3.4 Previous Landscape Strategy

3.4.1 A condition was attached to several planning permissions for development at Kronospan which required the development of a landscape strategy to mitigate the visual impact of the wider Kronospan site from public viewpoints. As such, the Applicant submitted a landscape strategy for the area surrounding the wider

Kronospan site to WCBC in 2017. The landscape strategy was approved in 2019, and planting has subsequently been carried out within land owned by the Applicant.

3.4.2 Further on-site and off-site planting will be undertaken (some planting has already been implemented, other planting will be undertaken in the near future) in relation to the planning permissions for the warehouse building, the engineering stores, and North Access Road.

4.0 THE PROPOSED DEVELOPMENT

4.1 Overview

4.1.1 A summary description of the Proposed Development is provided below.

4.1.2 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.

4.1.3 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.**

4.1.4 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.

4.1.5 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.

4.1.6 *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.

4.1.7 The location of the Proposed Development Site is shown at **ES Figure 1.1** and the drawing provided at **DNS3-001.** 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.

4.1.8 A detailed description of the Proposed Development (including proposed feedstock configuration) is provided at **ES Chapter 4.0 (Description of the Proposed Development)**.

4.1.9 An indicative 3D model (see **Appendix A**) of the proposed Low Carbon CHP Facility has been produced for illustrative purposes only.

5.0 NEED AND OVERARCHING DESIGN PRINCIPLES

5.1 Introduction

5.1.1 The following sub-sections provide an overview of the need for a proposed Low Carbon CHP Facility, how the approach to the overarching principle of the design (with respect operational energy requirements and feedstock) has been considered and refined to maximise efficiency and sustainability.

5.2 General

5.2.1 The Proposed Development forms part of a range of projects that have been proposed by Kronospan over recent years to improve the sustainability of operations at the Chirk manufacturing facility. The enhancements undertaken at the Site to date have enabled it to deliver continuous environmental improvement whist maintain the manufacturing efficiencies required to sustain an economically viable business in the short, medium and long term. The recent improvements were delivered as part of the Kronospan Vision 2020 programme which involved the business investing £200 million in the site in Chirk since 2015.

5.2.2 The most recent developments at the Site have helped deliver a more efficient manufacturing process, responding to the evolving nature of customer demands. The Chirk facility can now offer a greater range of products than was previously the case and the business is continuing to deliver new and upgraded facilities required to meet future customer demands. The investments made will help secure the jobs and financial benefits that the business brings to the local economy.

5.2.3 To ensure that Kronospan maintains its position in a competitive market, delivers its products in a more sustainable way and make improvements to its impacts on the local community, further investment at the Site is required to meet Kronospan's Vision 2025 and Vision 2030 objectives.

5.3 Kronospan Vision 2025 and Vision 2030

Overarching Sustainability Objectives of Vision 2025 and Vision 20230

5.3.1 Sustainability sits at the core of Kronospan's Vision 2025 strategy and has become a cornerstone of the Company's forward strategy. In delivering Vision 2025 and Vision 2030, Kronospan is seeking to achieve:

- Economic sustainability – delivering a profitable and growing business.
- Environmental improvement – reducing our impact and supporting UK Net Zero targets through production of sustainable products and operations.
- Social benefit – maximising the value of our teams and developing our role in the community.

Vision 2025

5.3.2 Following on from Kronospan's Vision 2020, the company has embarked on the delivery of Vision 2025 which is constructed around strategic goals, each with a series of objectives and detailed work streams.

5.3.3 Vision 2025 will adapt the site at Chirk to changes in the UK market for wood-based panel products ensuring it is able to sustainably fulfil the requirements of its customers and stakeholders. Some of the larger projects planned to deliver Vision 2025 include:

- North Access Road (Decision Notice is pending (under planning reference P/2022/1080) subject to confirmation of legal agreements for off-site enhancements).
- 132kV connection (to provide the grid connection for the proposed 132kV substation which forms part of the North Access Road planning permission referred to above).
- Solar plant.
- Electrification of the forklift truck (FLT) fleet.
- National network of 'Urban Forest' timber recycling centres.

Vision 2030

5.3.4 The core objective of Vision 2030 is to de-carbonise the existing Kronospan Facility as far as is practicable to ensure that the power (electrical and thermal) generation used directly for the manufacturing of all products significantly reduces its reliance on fossil fuels (burning of gas); this would subsequently ensure a net carbon benefit (see **Section 5.**5) in accordance with UK and Welsh Government Net Zero commitments, increase the effectiveness of Kronospan's existing Circular Economy approach (See **Section 7.2** of the Planning Statement (**DNS4-001**), and reduce the

carbon footprint of Kronospan's products (see **Section 3.7, ES Chapter 3.0 (Alternatives)**).

5.3.5 Subsequently, the Proposed Development is the key project which seeks to achieve the core objective of Vision 2030.

5.4 Environmental and Social Governance

5.4.1 Supporting the Vision 2025 strategy will be an annually published Environmental Social Governance (ESG) report for Chirk, assessing the Company's performance against the ESG targets in development through Vision 2025.

5.4.2 Kronospan is committed to reducing carbon as part of its operations and is a key aspect of its long-term sustainability goals. An extract from the Kronospan Environmental, Social and Governance Report 2022-2023 is provided below.

"Attaining carbon-negative production is one of our key goals and reflects our commitment to environmental responsibility. Businesses have fundamental responsibilities towards our planet and are increasingly called upon to reduce carbon emissions in their production processes. Recent research shows the significance of responsible forest management. Forests can be utilised as a natural and effective form of carbon storage. Furthermore, through the utilisation of end-of-life post-consumer timber as a raw material, compounded carbon absorption and storage can be achieved through a combination of sustainable forestry and efficient recycling practices. By utilising wood over energy-intensive materials, such as concrete and plastic, we can effectively limit emissions resulting from fossil fuels.

At Kronospan UK, we utilise wood-based products as raw materials, prolonging the period of carbon storage. In essence, Kronospan products function as material reservoirs of CO2. For a comprehensive understanding of our product-based circular approach aimed at achieving carbon-negative production, please refer to "We Aim for Carbon-Negative Production.

Recognising our presence in an energy-intensive industry, we understand the substantial energy requirements inherent to the production of wood-based panel products. The preparation of raw material involves processes such as breaking down and bonding timber fibres using significant heat and electricity. To fulfil our dedication to addressing climate change, we consistently channel significant investment into the

development and enhancement of technologies aimed at increasing production efficiency, whilst reducing emissions.

We believe continuous efforts will positively impact our sustainability journey. At Kronospan UK, we believe that harnessing renewable energy from end-of-life timber lies at the core of our business model, driving our continued commitment to combat climate change."

5.5 Changing Operational Energy Requirements

Current Position

5.5.1 The primary products manufactured at the Site are MDF and PB, from which several secondary products are produced such as laminate flooring, worktops and melamine faced boards. The site will also begin to install plant and manufacture OSB once the Natural Resources Wales (NRW) operational permit for OSB production has been issued.

5.5.2 The manufacturing processes which take place at Kronospan require significant quantities of heat and electricity. The high voltage electricity network in this part of Wales is sub-standard for the level of demand it is required to meet.

5.5.3 Regular maintenance has to be undertaken by the District Network Operator (DNO) to the local grid infrastructure to ensure it continues to supply the needs of Chirk and the surrounding area. During periods of maintenance, the supply of power to the Site can be severely affected, this in turn has a significant impact on manufacturing operations at the Site.

5.5.4 Due to the fragility in the local grid, Kronospan is only licensed to draw approximately 55% of their total demand from the grid. To meet its power demands, safeguard against the fragility of the local electricity grid, and reduce the risk of the local grid hindering the manufacturing efficiency of the site, Kronospan has installed its own power generation facilities at the Site.

5.5.5 A proportion of the power generation comes from an onsite biomass plant (the K7 and K8 Biomass Plants described in **Section 3.2**), which generates renewable energy. However, to meet the required demand, it has been necessary to install a series of natural Gas Engines (1 – 3) and Gas Turbines (1 and 2). Whilst the

installation of newer, more efficient gas engines in recent years has helped to reduce the carbon intensity of the operations at the Site, reliance on fossil fuel-based energy is not seen as the long-term future for business.

Position following Completion of North Access Road Works

5.5.6 The North Access Road planning permission includes (amongst other components) a proposed 132kV substation.

5.5.7 Kronospan has collaborated with the DNO to identify how the current local grid issues can be resolved. This has resulted in the proposal to develop a new 132kV substation which will enable Kronospan to connect directly into the strategic 132kV overhead line that runs from Oswestry to Legacy, Wrexham. To expedite the connection, Kronospan would construct the proposed 132kV substation.

5.5.8 This new connection would mean that Kronospan would no longer be reliant on the ageing 33kV infrastructure which provides power to other business, community facilities and residential properties in Chirk. This has a range of positive consequences to Kronospan and the community of Chirk as follows:

- Kronospan could reduce reliance on the onsite fossil fuel energy generation by drawing more from the electricity network, which is on a path to a low, and eventually zero, carbon future. Based on the most recent emissions data for the facility this could lead to a 59% reduction in carbon emissions by 2030, with even greater reductions as the grid mix decarbonises further.
- Kronospan will not be susceptible to intermittent constraints on the power it sources from the local grid, helping to maximise the manufacturing efficiency from the plant.
- The new connection and reliability that it would provide will enable investment to be made in future manufacturing lines essential to the future success of the business e.g. OSB production.
- A new connection would enable Kronospan to invest in further renewable energy projects on site such as solar PV, helping to contribute to the low carbon future for the plant.
- The new substation would reduce the strain on the existing local 33kV network helping to provide a greater security of supply to local business and residents (whose electrical energy demand will likely increase over time).

- Reduce the risk of intermittent or catastrophic failure of the local 33kV network which supplies essential infrastructure such as Chirk Community Hospital.
- The reduced demand on the local grid would enable Chirk to implement Electrical Vehicle charging schemes and open the opportunity for local community based solar schemes to connect into the grid which currently does not have the capacity to facilitate these Net Zero projects.

Future Position should the Proposed Development be Consented

Context

5.5.9 Whilst the future operation of the proposed 132kV substation would enable reliance on the onsite fossil fuel energy generation (as described above), this would not remove this reliance in its entirety due to the significant quantities of heat and electricity required to power existing operations. In addition, the extent to which the 132kV electricity grid would be used would also be dependent on commercial considerations i.e. the cost of electricity via the 132kV electricity grid versus the cost of obtaining electricity via onsite fossil fuel generation.

5.5.10 The existing Gas Turbines (1 and 2) and Gas Engines (1 – 3) generate waste heat and waste steam which is currently used for the direct drying of product from the primary manufacturing process via the MDF1 dryers, and for MDF1 and MDF2 manufacturing processes (respectively). This would be required to continue in a likely fluctuating capacity depending on day to day power and heat requirements, however, the existing K7 and K8 Biomass Plants similarly produce waste heat and combustion gases (which are also used for direct drying of product and in the MDF manufacturing process) and would be prioritised for use over the gas turbines and gas engines.

5.5.11 As a result, the future operation of the proposed 132kV substation would result in a reduced reliance on the gas turbines and gas engines but would not enable their use to cease in its entirety. The future operation of the proposed 132kV substation would provide Kronospan with surety and flexibility of supply.

5.5.12 However, as set out above, Kronospan is committed to the further decarbonisation of its operations; this is a critical aspect of its long-term sustainability goals.

Proposed Energy Generation Shift

5.5.13 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.

5.5.14 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.

5.5.15 The proposed shift in energy generation/use is summarised in **Table 5.1** below.

Table 5.1 – 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.	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

Component	Current Status	Proposed Status
	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.	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 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.	K8 Biomass Plant would remain in operation (for use in MDF1 process).
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	Both gas turbines would be decommissioned and removed as they are within the footprint of the proposed Low Carbon CHP Facility.

Component	Current Status	Proposed Status
	dryer (Gas Turbine 1) and MDF2 dryer (Gas Turbine 2).	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 manufacturing process via the MDF2 dryer. If MDF2 is offline, Gas Engines 2 and 3 are diverted to MDF1.	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 comparative imported gas and electricity costs; the running of the gas engines is expected to be infrequent.
Gas Engines 4 and 5	Consented but not yet installed.	Gas Engines 4 and 5 would not be installed.

5.5.16 The proposed Low Carbon CHP Facility would help to significantly decarbonise Kronospan's wood product manufacturing processes and make a valuable contribution to meeting the Welsh Government's Net Zero commitments.

5.5.17 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.

5.6 Feedstock

Overview of Changes to Proposed Low Carbon CHP Facility Feedstock Configuration/Sources

5.6.1 The original Proposed Development design was for the existing K7 Biomass Plant to remain in full operation. This was set out in the EIA Scoping Report (**ES Appendix 1C**) submitted to Planning and Environment Decisions Wales (PEDW) on 30 May 2024 under Regulation 14 of the EIA Regulations. This would result in less onsite derived feedstock for the proposed Low Carbon CHP Facility (since the existing K7 Biomass Plant feedstock would not be 'available'). On this basis the Applicant, at that point in the project design, was considering using Refuse Derived Fuel (RDF) as a feedstock for the facility.

5.6.2 Following receipt of the Scoping Direction (**ES Appendix 1D**), formal pre-application advice from PEDW (received 19 June 2024), further informal discussions with PEDW and informal pre-application discussions with WCBC, the Applicant issued (on 15 October 2024) a document to PEDW entitled 'EIA Scoping Direction Clarification and Update to the Proposed Development Design' (**ES Appendix 1E**). This document provided details of the proposed changes to the Proposed Development which arose since the initial pre-application advice was sought, as well as setting out broad areas of agreement and disagreement/clarification with the EIA Scoping Direction. A summary of the main Proposed Development design changes made at this point is provided below.

- The status of the existing K7 Biomass Plant would change from 'remaining in operation' to 'remain in situ but be used as a back-up biomass plant only' – as a result, the existing K7 Biomass Plant feedstock would be re-directed for use in the proposed Low Carbon CHP Facility.
- A detailed review of CHP Facility feedstock generated on-site was undertaken to understand the maximum wood residue feedstock that would be generated from existing and planned manufacturing operations.
- The proposed use of RDF was removed.

5.6.3 The proposed change to the Proposed Development design also confirmed that the proposed electrical generating capacity of the proposed Low Carbon CHP Facility would increase from 30 megawatts (MW) to 40MW.

5.6.4 An EIA Scoping Direction Addendum (see **ES Appendix 1F**) was issued by PEDW on 14 January 2025 and provides PEDW's updated opinion regarding the proposed EIA scope of the Proposed Development. Further details of the EIA Scoping Direction (and the Addendum) are provided at **ES Chapter 1.0 (Introduction)** and **ES Chapter 2.0 (EIA Methodology)**.

5.6.5 A summary of the changes to the configuration/sources of the feedstock required for the proposed Low Carbon CHP Facility is provided in **Table 5.2** below.

Table 5.2 – Changes to the Proposed CHP Feedstock Configuration

Type/Source (as described in the Pre-Application Request/Scoping Report)	Initial Approach (now superseded)	Proposed (Revised) Approach
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	**65,000 tonnes per annum (TPA)**	2021 – 83,577 TPA 2022 – 77,495 TPA 2023 – 69,990 TPA **2021-2023 Average – 76,991 TPA**

Type/Source (as described in the Pre-Application Request/Scoping Report)	Initial Approach (now superseded)	Proposed (Revised) Approach
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 to remain in full operational **0 TPA**	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**
Source C - Other On-Site Process Residues Extraction of smaller fractions of recycled timber or fines from the existing Particleboard (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.	**75,000 TPA**	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

Type/Source (as described in the Pre-Application Request/Scoping Report)	Initial Approach (now superseded)	Proposed (Revised) Approach
		2021-2023 Average – 108,455 TPA
Source D - Importing Grade C Waste Wood to Site for Direct Use in Proposed Low Carbon CHP Facility	**153,000 TPA**	**0 TPA** See text below Table 5.2 for further details of proposed approach to import of Grade C waste wood as part of 'off-site' feedstock source.
Source E – Importing up to 30,000 TPA of RDF and/or Forestry Residues for Direct Use in Proposed Low Carbon CHP Facility This would be considered as part of the overall 153,000 TPA associated with Source D. In other words, if 30,000 TPA of RDF and/or forestry residues was imported, 123,000 TPA of Grade C waste wood would be imported.	**30,000 TPA** (considered as part of the 153,000 TPA associated with Source D)	**0 TPA** See text below Table 5.2 for further details of proposed approach to import of forestry residues as part of 'off-site' feedstock source.
TOTAL	293,000 TPA	260,113 TPA (based on 2021-2023 average)

Type/Source (as described in the Pre-Application Request/Scoping Report)	Initial Approach (now superseded)	Proposed (Revised) Approach
Other Sources	N/A	There would be a 'remainder' of 32,887 TPA of feedstock required for the proposed Low Carbon CHP Facility Further details as to how this would be met is provided below.

5.6.6 As set out in **Table 5.2** 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 is a proposed increase from 48% (original design) to 88.7% (proposed design), meaning that the vast majority of the feedstock would now be sourced from on-site processes.

How the 'Remainder' would be Met

Overview

5.6.7 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 5.2**), 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.

5.6.8 The feedstock 'remainder' would be made up by:

- 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.

5.6.9 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.

5.6.10 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.

Increased On-Site Production

5.6.11 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 residue production set out in bullet point 3 above.

5.6.12 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 on a percentage rate of 20% arisings from the raw material/primary process.

Alternative Approaches to CHP Facility Feedstock Configuration/Sources

5.6.13 The proposed changes to the CHP Facility feedstock configuration/sources have been extensively considered by the Applicant with the sole objective of maximising the amount of feedstock that could be generated on-site (to subsequently minimise the quantity of feedstock to be imported to site, and waste residue exported offsite). Therefore, and not withstanding the potential for up to 100% of feedstock to be generated on site (depending on market factors and material available as set out above) it is considered that there are no viable alternatives that would enable Kronospan to make an absolute commitment to further increase (from the 'baseline' of 88.8%) the quantity of feedstock that could be generated on-site.

6.0 OTHER DESIGN PRINCIPLES

6.1 Introduction

6.1.1 The following sub-sections provide an explanation of the other principles and concepts that have been applied in developing the design of the Proposed Development.

6.2 Location

Overview

6.2.1 A site search and appraisal exercise was undertaken in 2022 to ascertain the most appropriate location for the proposed Low Carbon CHP Facility.

6.2.2 Given the purpose of the proposed Low Carbon CHP Facility is to provide on-site electricity and heat for direct use in Kronospan's ongoing operations, the early site search exercise was restricted to locations within the existing Kronospan Facility.

6.2.3 The early site search exercise was based on a proposed Low Carbon CHP Facility that would be able to provide all power (electrical and thermal) needs for the existing Kronospan Facility; as such, for the purpose of this exercise a larger CHP Facility (with a thermal energy output of 245 MW) than the proposed Low Carbon CHP Facility (125 MW thermal energy output) was initially considered.

6.2.4 The key parameters considered when selecting and assessing potential site locations were as follows:

- 1. Due to a general lack of available space within the existing Kronospan Facility, the **ability to physically accommodate all components of the proposed Low Carbon CHP Facility** as close together as practicable, without an unacceptable knock-on effect for the continued operation of the existing Kronospan Facility (including reducing, splitting or relocating existing site processes/components).
- 2. **Proximity to residential receptors and consideration of amenity** (with respect to the potential for adverse noise, and landscape and visual effects).
- 3. **Proximity to components of comparable size and/or type** – the grouping together of similarly sized components/buildings, particularly the larger infrastructure at the southwestern extent of the existing Kronospan Facility, which would help to reduce amenity effects discussed above.

- 4. **Approximate length of piped infrastructure for efficient and effective transfer of waste heat** between the proposed Low Carbon CHP Facility and the existing Medium Density Fibreboard (MDF) 1 and 2 dryers.

6.2.5 Based on the above, four potential indicative locations were identified as follows:

- Site 1 – West of Kronospan Plus
- Site 2 – West of the Formalin Facility 1
- Site 3 – West of the Formalin Facility 2
- Site 4 – East of the Rail Offloading Area

6.2.6 Due to the size and scale of the CHP plant required to provide all power need for the existing Kronospan Facility, Sites 1 – 4 are all on land currently used for open wood storage where there would be sufficient space to accommodate the development; however, this would be at the expense of a large proportion of the open wood storage area, which is a critical aspect of day-to-day operations.

6.2.7 As such, two further potential indicative locations (Site 5 and Site 6) were identified away from the existing open wood storage areas. Due to space limitations (resulting from the nearby presence of other built infrastructure), Site 5 and Site 6 (in comparison to Sites 1 – 4) have a smaller footprint, would necessitate a smaller CHP plant, and would not be capable of providing all thermal energy needs for the existing Kronospan Facility (the latter meaning one of the existing biomass thermal energy generators (biomass plant) would remain in operation – see **Table 4.1, ES Chapter 4.0 (Description of the Proposed Development)** for further details of existing and proposed energy generation on the existing Kronospan Facility).

6.2.8 The two further potential indicative locations are summarised below

- Site 5 – On the Footprint of the Existing Gas Turbines 1 and 2 (the Proposed Development Site)
- Site 6 – West of the Proposed Engineering Stores (granted 07 November 2022 under planning reference P/2022/0615)

6.2.9 The subsequent appraisal of Sites 1 – 6 (set out below) does not factor in the differences in long-term energy generation implications (between Sites 1 – 4 and Sites 5 – 6 as set out above) as those differences are clear, all sites would still offer significant net carbon benefits whereby reliance on the existing gas turbines and gas engines could be substantially reduced (see **ES Chapter 9.0 (Climate Change)** for further details), and the Applicant considered the four key parameters detailed above to carry greater weight to ensure the most appropriate location was selected.

6.2.10 The subsequent appraisal of Sites 1 – 4 (set out below) also considers both the initial larger CHP plant and the smaller plant (that Site 5 and Site 6 can only accommodate) to ensure a fair and balanced appraisal; this is relevant for Parameter 2 and Parameter 3.

6.2.11 The location of Sites 1 - 6 can be viewed below at **Inset 6.1** and is also provided at **ES Figure 3.1**.

Inset 6.1 – Alternative Sites for Low Carbon CHP Facility

Summary of Appraisal

Parameter 1 – Availability of Space

6.2.12 Although Sites 1, 2, and 4 would provide sufficient space for all components of the proposed Low Carbon CHP Facility, they are not preferred due to the resulting loss of a large amount of space currently used for open wood storage which would be very difficult to replace elsewhere due to site-wide physical constraints.

6.2.13 Although Site 3 would provide sufficient space for all components of the proposed Low Carbon CHP Facility, it is not preferred as it would result in the loss of a large amount of space currently used for open wood storage which would be very difficult

to replace elsewhere and would require the relocation of the existing sawmill which would have significant cost and programme implications.

6.2.14 Although Site 5 only has sufficient space to accommodate the proposed Low Carbon CHP Facility (with the proposed feedstock facilities to be positioned elsewhere on the existing Kronospan Facility (optimum position would be southern extent of Site 2)), it is preferred as Site 5 would recycle land which would be vacated by the existing Gas Turbines 1 and 2. Using the southern extent of Site 2 for proposed feedstock facilities is preferred as there would be sufficient space, is close to the recently consented silos that would house the majority of the feedstock, and it is relatively close to Site 5 which would minimise the length of the proposed feedstock transportation facilities (overhead conveyors). Further, the loss of land currently used for open wood storage to accommodate the proposed feedstock facilities would be approximately 25-30% of Site 2; this has a much-reduced impact in comparison to the use of Sites 1 – 4 for the proposed Low Carbon CHP Facility as a whole and would (comparatively) ensure more land for open wood storage is retained.

6.2.15 Site 6 is not preferred as it would require the removal of existing and established woodland, the relocation of the existing SPEN 132kV substation, is partly on third party land (and would require suitable land agreements) and would have significant cost and programme implications. Site 6 would also require extensive lengths of overhead conveyor systems due to the need for the proposed feedstock facilities to be positioned elsewhere on the existing Kronospan Facility (optimum position would be southern extent of Site 2) which would result in extensive overhead conveyor systems due to the distance between Site 6 and Site 2.

Parameter 2 – Proximity to Residential Properties

6.2.16 At their closest point, Sites 1 – 4 are approximately 300m from residential properties to the east, compared to approximately 500m for Sites 5 and 6.

6.2.17 Sites 5 and 6 are the most suitable options as they offer greatest potential for reduced environmental (amenity) effects (particularly with respect to noise effects and landscape and visual effects) given they are further away from residential properties than Sites 1 – 4; landscape and visual considerations are also discussed further below (under the heading ‘Parameter 3 - Proximity to Components of Comparable Size and/or Type’).

6.2.18 For the reasons set out above, Sites 1 – 4 are the least suitable options.

Parameter 3 – Proximity to Components of Comparable Size and/or Type

Context

6.2.19 Sites 1 – 4 are in the northern half of the existing Kronospan Facility, predominately characterised by open wood storage at the western extent, and Kronospan Plus, the Formalin Facility, the sawmill, and the recently constructed northeast warehouse at the eastern extent.

6.2.20 Sites 5 and 6 are in the southern half of the existing Kronospan Facility, which is predominately characterised by substantial built development (significantly more so than the northern extent). Of this substantial built development, those of a greater overall mass are predominately contained to the southwestern extent of the existing Kronospan Facility and include (but are not limited to) the MDF Facility (height of cyclones 57m), Gas Engines 1 – 3, Gas Turbines 1 and 2, K7 and K8 Biomass Plants (including biomass plant stack height of 70m), SEKA wet electrostatic precipitator (WESP) filter (stack height of 65.5m), and the WESP chip dryer (stack height of 50m).

6.2.21 A covered loading yard and storage area (granted 04 July 2022 under planning reference P/2022/0336) and a new building to form engineering stores and a dedicated apprentice workshop (granted 07 November 2022 under planning reference P/2022/0615) will be constructed at the southeastern and southwestern extents of the southern half of the existing Kronospan Facility respectively.

6.2.22 The height of the proposed boiler building would be 44m) and the height of the proposed stack would be 75m. As such sites that are closer to the generally larger infrastructure in the southern half of the existing Kronospan Facility, and particularly the existing, taller stacks in the southwestern extent, would be favoured. This approach would result in a smaller degree of change in respect of landscape and visual impact from nearby receptors, and impact on the Essential Setting of the Pontcysyllte Aqueduct and Canal World Heritage Site (WHS).

Appraisal Summary

6.2.23 Sites 1 – 4 are in the northern half of the existing Kronospan Facility. As described above, there is significantly less built development in the northern half of the existing

Kronospan Facility (compared to the southern half). The warehouse buildings in both the northern and southern halves of the existing Kronospan Facility are of a similar height (between approximately 10-12m in height); approximately half of the land in the northern half is occupied by open wood storage with greater spacing between the existing warehouse buildings (compared to those in the southern half which largely run back-to-back across much of the full length of the site).

6.2.24 As such, for Sites 1 - 4, there is no opportunity to position the proposed Low Carbon CHP Facility close to existing infrastructure of a similar type, size and scale described in paragraph 6.2.20 above (notably the existing stacks) which would otherwise help to minimise landscape and visual effects and associated historic environment effects.

6.2.25 Site 5 is on the footprint of the existing Gas Turbines 1 and 2, which would be decommissioned and removed from site (as an inherent part of the Proposed Development and attaining the core objective of decarbonisation). The existing Gas Engines 1 – 3, K7 and K8 biomass plant stacks, SEKA WESP filter and the dryer exhaust stack at the WESP Chip Dryer are adjacent or very close to Site 5. The existing MDF cyclones are approximately 150m to the south of Site 5.

6.2.26 As such, Site 5 would enable the proposed Low Carbon CHP Facility to be positioned close to existing infrastructure of a similar type, size and scale (including the existing stacks described in paragraph 6.2.20) which would help to minimise landscape and visual effects and associated historic environment effects.

6.2.27 In comparison to Site 5, Site 6 is further away (between 100m and 200m) from the existing infrastructure of a similar type, size and scale (including being close to the existing stacks described in paragraph 6.2.20)

6.2.28 However, Site 6 is immediately adjacent the existing MDF cyclones (57m high) which would help to minimise landscape and visual effects and associated historic environment effects, but not as effectively as Site 5.

Conclusion

6.2.29 Sites 1 – 4 are the least suitable options due to being in the northern half of the existing Kronospan Facility and, as such, being further away from infrastructure of a similar type, size and scale (including the existing stacks).

6.2.30 Site 5 is the most suitable option, followed by Site 6, due to being in the southern half of the existing Kronospan Facility and, as such, its closer proximity to existing infrastructure of a similar type, size and scale (including the existing stacks).

Parameter 4 – Approximate Length of Piped Infrastructure

Context

6.2.31 The Proposed Development would result in the decommissioning and removal of existing Gas Turbines 1 and 2, which currently provide waste heat for the direct drying of product from the primary manufacturing process via the MDF 1 and 2 dryers. Waste heat from the proposed Low Carbon CHP Facility would replace the waste heat from Gas Turbines 1 and 2.

6.2.32 Waste heat transfer infrastructure is already in place between the MDF 1 and 2 dryers and the existing Gas Turbines 1 and 2, Gas Engines 1 – 3, and the K7 and K8 Biomass Plants at the southwestern extent of the existing Kronospan Facility. As such, new waste heat transfer infrastructure would be required from the proposed Low Carbon CHP Facility.

Appraisal Summary and Conclusion

6.2.33 Site 5 is the most suitable option, followed by Site 6 given they are close to the existing waste heat transfer infrastructure, allowing a short connection to be made.

6.2.34 Sites 1 – 4 are the least suitable options given they require between 200m and 450m of new waste heat transfer infrastructure, with Site 1 requiring the longest length.

Summary and Conclusion

6.2.35 On balance, Site 5 is the preferred location for the proposed Low Carbon CHP Facility as it is the most suitable option for Parameters 1, 3, and 4 and the joint most suitable (together with Site 6) for Parameter 2. The recycling of the land (which would be vacated by the existing Gas Turbines 1 and 2) is a more efficient and sustainable use of land than other site options.

6.2.36 It is acknowledged that Site 5 only has sufficient space to accommodate the proposed Low Carbon CHP Facility and that the proposed feedstock facilities would be required to be positioned on the southern extent of Site 2. Whilst Site 2 is not a

preferred site for the proposed Low Carbon CHP Facility in its entirety for any of the four parameters, the use of the southern extent of the site to accommodate the proposed feedstock facilities is considered suitable for the following reasons:

- There would be sufficient space, is close to the recently consented silos that would house the majority of the feedstock, and it is relatively close to Site 5 which would minimise the length of the proposed feedstock transportation facilities (overhead conveyors).
- The loss of land currently used for open wood storage to accommodate the proposed feedstock facilities would be approximately 25-30% of Site 2; this has a much-reduced impact in comparison to the use of Sites 1 – 4 for the proposed Low Carbon CHP Facility as a whole and would (comparatively) ensure more land for open wood storage is retained.
- Although closer to residential properties than Site 5, the proposed feedstock facilities are generally smaller in mass and height than the more prominent proposed Low Carbon CHP Facility components (being the proposed boiler building and proposed stack), would visually integrate more effectively with the existing infrastructure of a similar mass and height (notably the sawmill, the existing and recently consented silos, and the existing overhead conveyor systems) and are less likely to result in significant environmental and end amenity effects.

6.3 Layout Options for Proposed Low Carbon CHP Facility

Introduction

6.3.1 The layout of the Proposed Development is driven by the operational requirements of the Kronospan Facility and by the physical and environmental constraints present within the Site and the surrounding area.

6.3.2 As set out in **Section 6.2** above, the site of the proposed Low Carbon CHP Facility is the smallest of all potential sites identified; there is only sufficient space to accommodate the proposed Low Carbon CHP Facility (with the proposed feedstock facilities to be positioned elsewhere on the existing Kronospan Facility). As such, the layout of the proposed Low Carbon CHP Facility has been carefully considered by the Applicant and Aalborg Energie Technik (AET) to ensure that the available space can physically accommodate it without compromising its function. As such,

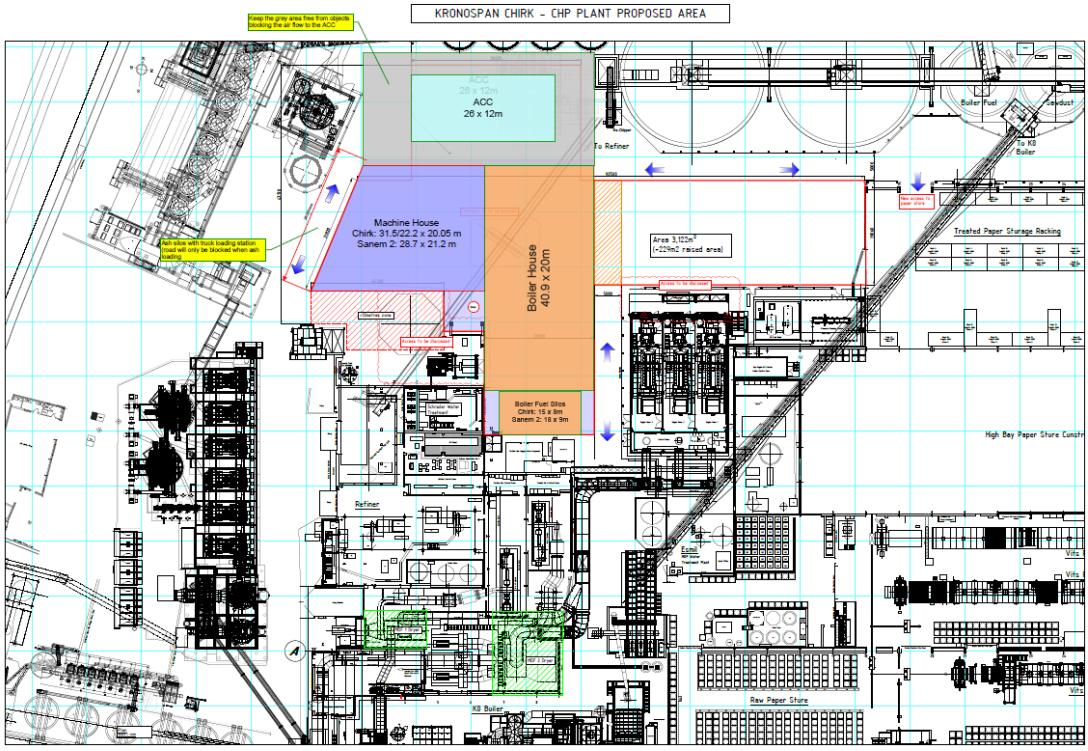
the proposed layout is a bespoke CHP solution working within the physical restrictions presented by the preferred site.

Layout Options

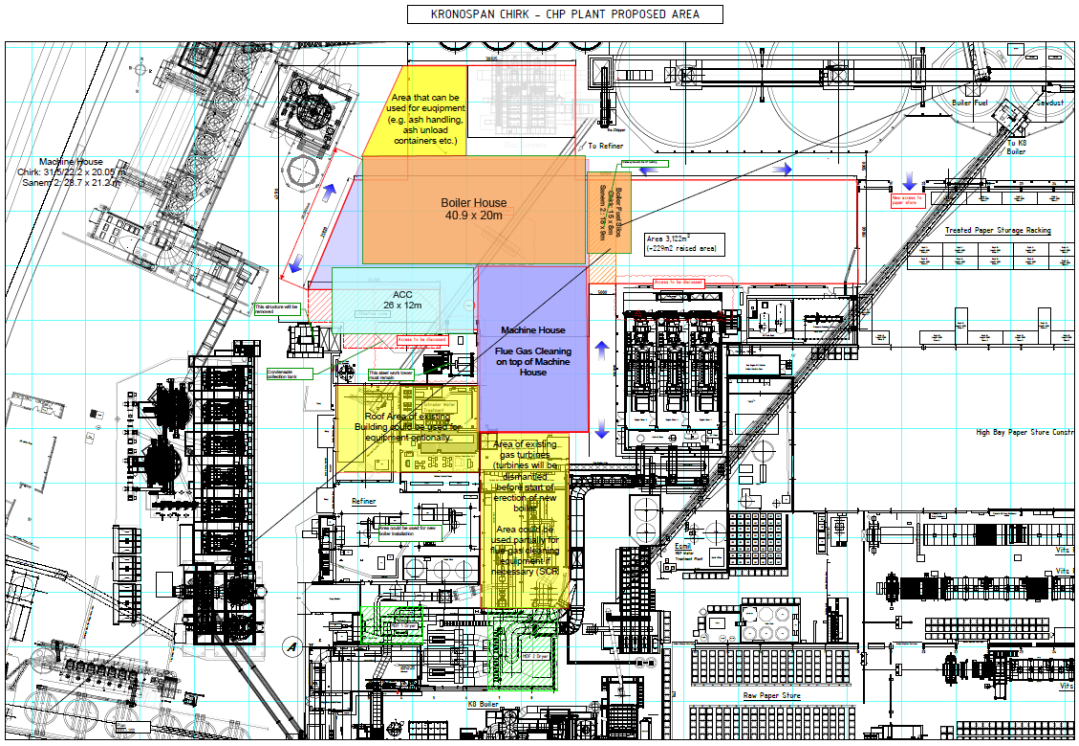
6.3.3 The Applicant approached three specialist CHP/biomass service providers (Dieffenbacher, Dalmat, and AET) for CHP solutions on Site 5 capable of achieving the core objective of generating up to 40 MW of electricity and 125 MW of thermal energy for use in the existing manufacturing processes at the existing Kronospan Facility (via a maximum feedstock throughput capacity of 293,000 tonnes per annum).

6.3.4 Due to the relatively small and constrained footprint of Site 5, the feasibility brief agreed with the three service providers excluded the provision of proposed feedstock storage and handling facilities i.e. the feasibility brief was restricted to the proposed Low Carbon CHP Facility with the design of the proposed feedstock storage and handling facilities (including their physical connection to the proposed Low Carbon CHP Facility) to be managed by the Applicant. As expected, (due to its constrained footprint), all three service providers provided similar CHP solutions for Site 5 (resulting in two core layout options) to the extent that they offered no measurable/notable advantages or disadvantages from one another with respect the four key parameters identified above or any other environmental considerations. An overview of the two core layout options is provided at **Inset 6.2** and **Inset 6.3** below, noting that the placement of components was not considered to be rigid/fixed to the extent that there would be no flexibility for alternative positioning (for example, to enable physical connections to be made to proposed feedstock storage and handling facilities).

Insert 6.2 – Core Layout 1



Inset 6.3 – Core Layout 2



6.3.5 The CHP layouts have three core operative areas: the machine house (which includes the stack), the boiler house, and the Air Cooled Condenser (ACC) (detailed descriptions of these components are provided in **ES Chapter 4.0 (Description of the Proposed Development)**). Following a review of the two core layout options, the following Site 5 objectives were identified as paramount to the Site 5 layout to minimise environmental effects whilst maximising operational effectiveness and efficiency:

- Minimise the removal and/or replacement/relocation of existing infrastructure as far as practicable.
- When considering residential receptors, prioritise minimising visual impact over minimising noise impact (particularly for taller components) as the former can only effectively be mitigated through site placement, whilst the latter can effectively be mitigated by site placement and/or the implementation of noise abatement mitigation measures.
- The machine house area should be positioned as far south as practicable to ensure that the stack (approximate height of 90 – 95 m at early design stage) could be positioned as close as practicable to the existing stacks.
- The boiler house (with an approximate height of 40-45m) should be positioned as far west as practicable, away from residential receptors to the east. The area immediately south of the existing chip preparation building was preferred as it is of a similar height and mass to the proposed boiler house.
- The ACC (as the lowest component with an approximate height of 20 – 25m) could feasibly be positioned anywhere within Site 5 (but with priority given to the positioning of the machine house area and boiler house given they are taller components). The ACC is typically the CHP component that generates the greatest noise and would therefore typically be positioned furthest away from residential receptors; however, if positioned towards the eastern extent of Site 5, this would ensure that it would be adjacent the existing enclosed warehouses (which are of a similar height) and would not be so far east as to be likely to generate a notable increase in noise at residential receptor locations (approximate 75m distance between eastern and western extents of Site 5 resulting in distance from residential receptors of between approximately 475m – 550m respectively).

6.3.6 Subsequently, Core Layout 2 provided at **Inset 6.3** was selected as preferred and formed the basis of the design. The main deviation from that core design is to accommodate the preference to site the ACC at the eastern extent of Site 5 (as described in the final bullet point above); this also ensures that the far northern extent of Site 5 could remain available to accommodate proposed connections (via overhead conveyors) between the proposed Low Carbon CHP Facility and the proposed feedstock storage and handling facilities (the latter designed by the Applicant) using the southern extent of Site 2. All three service providers were able to provide a technical layout and supporting drawings and documentation compliant with **Inset 6.3**. Following a formal commercial tendering exercise with all three service providers, AET was subsequently selected by Kronospan as the preferred service provider.

6.3.7 An assessment of noise and vibration likely to result from the proposed Low Carbon CHP Facility, including the identification of noise mitigation measures to ensure no significant noise effects would arise, is set out at **ES Chapter 5.0 (Noise and Vibration)**. No significant noise and vibration effects are anticipated; this supports the assumptions described above with respect prioritising visual impact over noise impact, in particular the proposed positioning of the ACC.

6.4 Stack Siting and Height Considerations

Siting

6.4.1 The site of the proposed Low Carbon CHP Facility was selected (amongst other reasons) due to its proximity to existing infrastructure of a similar type, size and scale, notably existing energy-related infrastructure. As the proposed stack would be the tallest component, the layout has been designed to ensure the stack is at the southern extent of the Site, closer to the existing stacks, to minimise adverse visual effects.

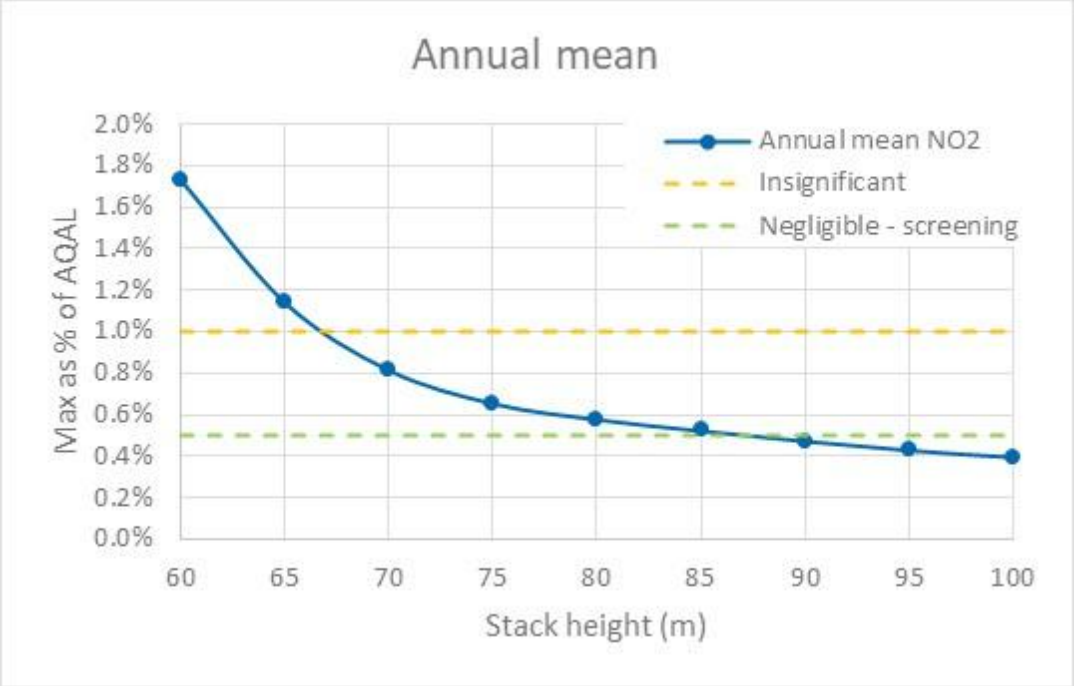
Height

6.4.2 The stack height was set at a precautionary height of 95m at the outset of the design (to inform the EIA Scoping Report (**ES Appendix 1C**)).

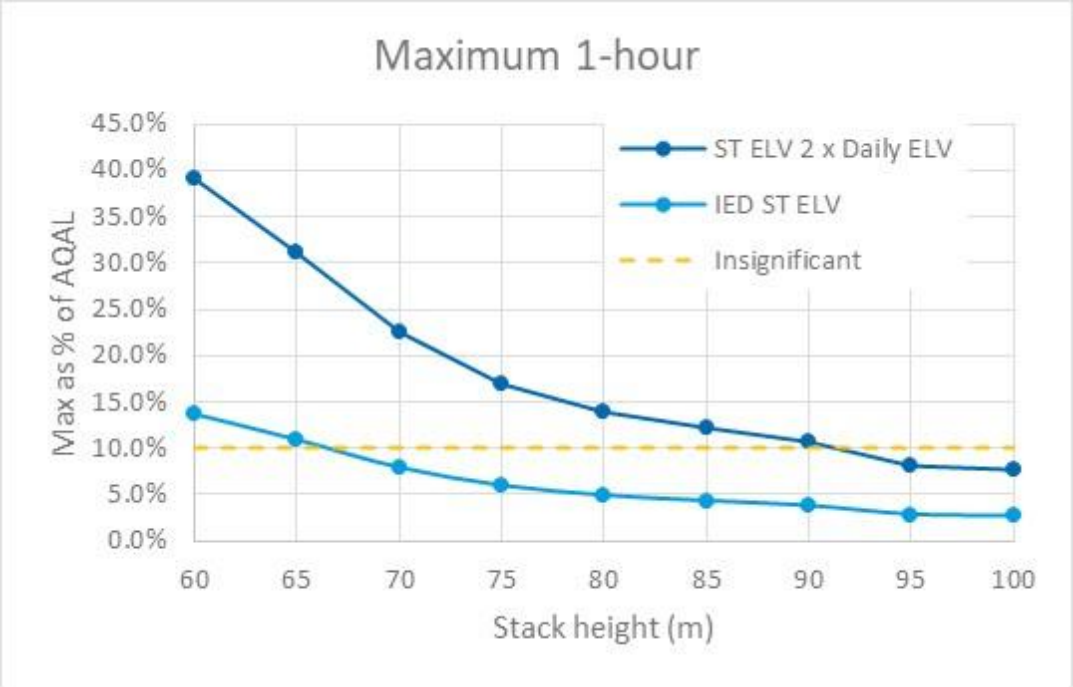
6.4.3 Under normal operations, the exhaust gases from the proposed Low Carbon CHP Facility would be used in the direct drying of product from the primary manufacturing

process via the MDF dryers. However, if the dryers are offline and the proposed Low Carbon CHP Facility was online, these emissions would need to vent to atmosphere via a dedicated stack. The height of this stack has been determined by running the air quality dispersion model (see **ES Appendix 6C** and **ES Appendix 6D**) for a range of stack heights and identifying the point at which there is a diminished reduction in ground level concentration with increased stack height. The maximum annual mean and 1-hour concentrations of nitrogen dioxide are presented at **Inset 6.4** and **Inset 6.5** respectively.

Inset 6.4 – Stack Height Analysis (Annual Mean)



Inset 6.5 – Stack Height Analysis (Maximum 1-Hour)



6.4.4 As shown at **Inset 6.4**, there is a notable change in the angle of the slope for annual mean impacts at 75m stack height.

6.4.5 When considering the maximum 1-hour impact (**Inset 6.5**), there is a change in angle of the slope at 75m and at 90m. However, with a 75m stack height, the impact can be described as insignificant if it is assumed that the half-hourly emission limit value (ELV) is double the daily mean ELV in line with the ratio between the daily and half-hourly ELV for oxides of nitrogen as set out in the Industrial Emissions Directive (IED) (Directive 2010/75/EU).

6.4.6 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.

6.4.7 Further information regarding the air quality dispersion model and the stack height analysis (summarised above) is provided at **ES Chapter 6.0 (Air Quality and Odour)** and its accompanying **ES Appendix 6C** and **ES Appendix 6D**.

6.5 Layout and Scale - Proposed Feedstock Storage and Handling Facilities

Feedstock Storage

6.5.1 The Applicant obtained planning permission in January 2023 (planning reference P/2022/0765) for the erection of two raw material silos, an extension to the existing chip preparation building, and erection of three silos and associated works. Those works have not yet commenced.

6.5.2 The Applicant has taken the decision to repurpose the two raw material silos granted (but not constructed) under planning permission P/2022/0765 to provide feedstock storage capability as part of the proposed Low Carbon CHP Facility; this is possible due to the proposed relocation of the existing chip screening facility (see drawings provided at **DNS3-002** and **DNS3-003**) which will screen chips prior to their onward transportation and storage in the existing chip silos (which currently hold unscreened chips prior to onward transportation and screening). Further details of the above are provided at **Section 4.14, ES Chapter 4.0 (Description of the Proposed Development)** (Component ID 5 – Chip Screening Facility).

6.5.3 As the silos consented under planning reference P/2022/0765 are in a slightly different position (also check dimensions) 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.

6.5.4 The main benefits of the above approach 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.

6.5.5 The two silos would be approximately 33.5m in height and positioned immediately north of the existing chip silos, which are of a similar footprint, scale, and height.

6.5.6 A further feedstock storage facility is proposed immediately east of the existing chip silos and would be approximately 11.2m high.

6.5.7 The layout and positioning of the feedstock storage facilities have been carefully considered with respect surrounding infrastructure to minimise adverse visual effects.

Feedstock Handling

6.5.8 Two feedstock screening facilities are proposed. 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.

6.5.9 The feedstock screening facilities would be approximately 14m high and positioned at the eastern extent of the Proposed Development Site, close to existing infrastructure of a similar scale and height (such as the sawmill). One of the two proposed feedstock screening facilities would be constructed on the footprint of the (to be removed) Recycled Wood Fibre (RCF) materials reception building.

6.5.10 The proposed grouping of the feedstock storage and handling facilities at the northeastern extent of the Proposed Development Site has been carefully considered with respect surrounding infrastructure to minimise adverse visual effects.

6.5.11 The feedstock would then be transferred to the proposed boiler building via an overhead conveyer system; this would be constructed within areas where existing overhead conveyor systems (as part of ongoing manufacturing operations) already exist and would serve to further minimise adverse visual effects.

6.6 Colour

Introduction

6.6.1 To examine the potential implications of different cladding colours on the proposed CHP Building, a Colour Study (see **ES Appendix 3A**) has been undertaken.

Approach

6.6.2 The baseline for the study is the pale Goosewing Grey coloured cladding (RAL 080 70 05) utilised across the majority of existing structures at the existing Kronospan Facility.

6.6.3 The Colour Study examines the potential for a reduction in the visual effects of the proposed Low Carbon CHP Facility that might be achieved by substituting the Goosewing Grey cladding with alternate colours as follows:

- Quartz Grey (RAL 080 50 20).
- Camouflage Green (RAL 110 50 10).
- Olive Green (RAL 100 30 20).
- Colour banding, running from a dark green at the bottom of the building to Goosewing Grey at the top of the building (the approach taken reflects similar cladding on the existing Encirc Glass building at Ince, Cheshire).
- Light Grey (RAL 7035).

6.6.4 The colour options were applied to the CHP building from four of the LVIA Viewpoints (refer to **ES Chapter 7.0 Landscape and Visual Impact Assessment** for further details regarding viewpoints). The viewpoints were selected to reflect views from more sensitive locations at different directions from the Kronospan site, and are as follows:

- Viewpoint A, located at Chirk Recreation Ground in the centre of town.
- Viewpoint B, located along the Offa's Dyke Path National Trail, and within the Clwydian Range and Dee Valley National Landscape.
- Viewpoint C, located along the B5070 at the northern edge of Chirk.
- Viewpoint M, located along the towpath of the Llangollen Canal.

6.6.5 The appearance of the proposed Low Carbon CHP Facility from each Viewpoint, based upon Goosewing Grey cladding and each of the four alternative cladding options set out above, is shown on the illustrative photomontages presented on **Figures 1-4** of **ES Appendix 3A**.

Conclusion

6.6.6 Following an examination of potential alternative cladding colour options, it is considered that the baseline Goosewing Grey cladding remains the most appropriate colour for the proposed CHP building. Goosewing Grey would provide the least contrast with existing structures at Kronospan, and thus the proposed CHP Building would look the least distinct if this colour cladding is utilised. Whilst use of Camouflage Green cladding may result in the proposed CHP Building appearing more recessive from Chirk Recreation Ground due to it being backgrounded by the hills behind, in reality this would vary depending upon light conditions and could also result in increased adverse visual effects at some times.

6.7 Other Environmental Considerations

6.7.1 The ES which forms part of this planning submission identifies and assesses the following likely environmental effects:

- Noise and Vibration.
- Air Quality and Odour.
- Landscape and Views.
- Historic Environment.
- Climate Change.
- Waste.
- Population and Human Health.

6.7.2 This DNS application is also supported by the following Supporting Documents which provide further details of likely environmental effects (outside of the EIA scope):

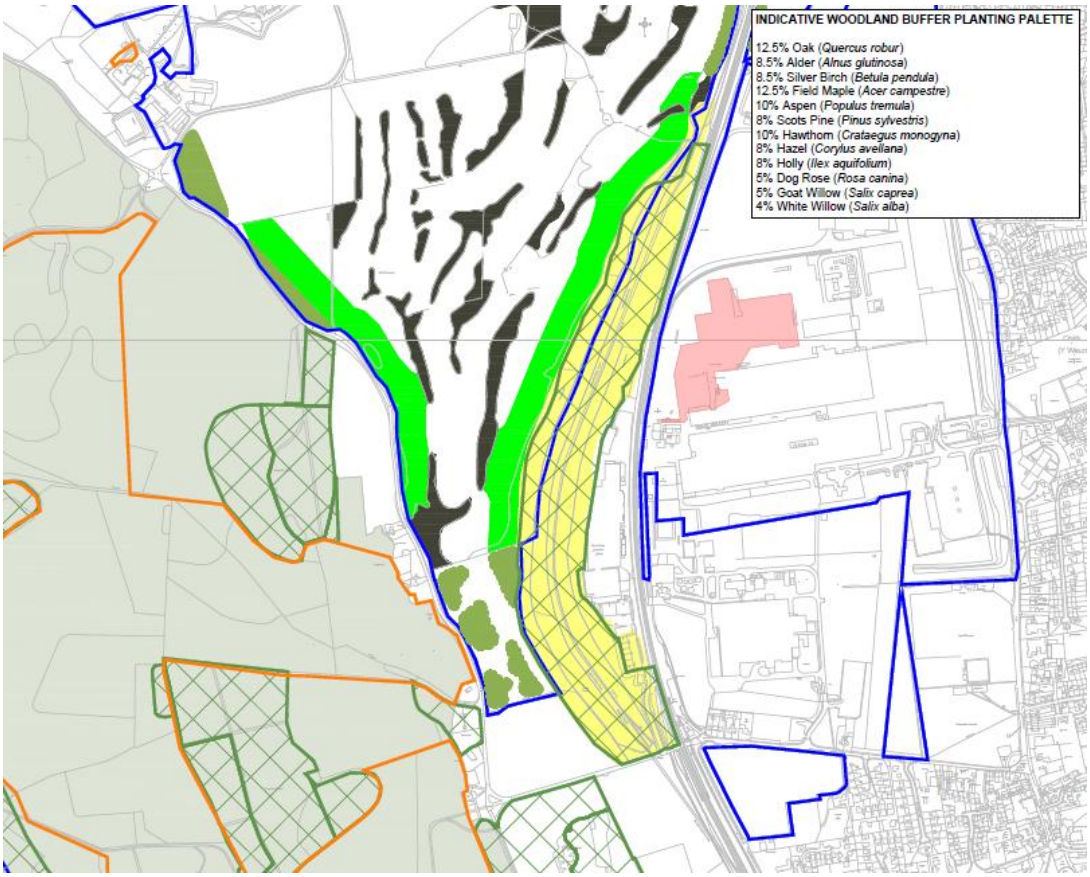
- Transport Statement.
- Phase 1 Geo-Environmental Assessment.
- Biodiversity Assessment Report.
- Green Infrastructure Statement.

6.7.3 The design outcomes recommended in these documents which have been incorporated into the design of the proposed Low Carbon CHP Facility include:

- Noisiest CHP components to be constructed from double skin acoustic cladding to provide effective noise attenuation.
- Ensuring other CHP components (such as ACC fans, fan stack, smaller external plant (such as pumps), boiler roof vents, ID fan, pre-crusher plant) to be designed to a set sound power level to ensure significant adverse noise effects can be avoided.
- Fuel will be transferred to the proposed Low Carbon CHP Facility using walking floor trailers, and the opening of the building will include a mist air system and curtains. This would prevent the release of odours and dust from the proposed Low Carbon CHP Facility.
- The materials used in the plant buildings and operational equipment will be resilient to expected climatic extremes with British Standards applicable for most materials to ensure that extreme climatic conditions are accounted for.
- The ventilation system will be designed to withstand a range of temperatures greater than the currently experienced temperatures to account for climate change.
- The proposed Low Carbon CHP Facility is designed to minimise water use. Additionally, the condensate from the flue gas treatment (FGT) system would be recirculated and reused in the boiler and any water not vapourised in the quenching process would be collected and recycled for continued use in the quenching process.

6.7.4 Biodiversity mitigation and enhancement measures will be implemented to increase the resilience of the ecological habitats to air quality impacts. This includes new native woodland planting adjacent to existing woodland to the west of the canal corridor, and further new native woodland along the eastern side of the minor road (Llwyn-y-Cil) which forms the eastern boundary to the Chirk Castle Estate. Further details of the mitigation and enhancement proposals are contained in the Biodiversity Assessment Report (**DNS4-007**) and are illustrated on the drawing provided at **DNS3-012**.

Inset 6.6 – Proposed Biodiversity Mitigation and Enhancement



- Proposed Development
- Land under the control of the Applicant
- Chirk Castle Site of Special Scientific Interest (SSSI)
- Canal Wood Local Wildlife Site (LWS)
- Ancient Woodland
- Priority Habitat (excluding Lowland Mixed Deciduous Woodland)
- Existing Woodland at former golf course
- Recent Kronospan Planting, or Planting required by extant Planning Consents
- Proposed Woodland Buffer to Canal Wood LWS and CHirk Castle SSSI

NOTES - PROPOSED WOODLAND BUFFER

1. Aims of management are to improve habitat extent and connectivity and maintain species diversity and habitat condition within the LWS and SSSI
2. Proposed Woodland Buffer to comprise a continuous belt of width 30m-50m, to form a woodland of diverse structure including a well developed understorey layer.
3. Species to include tree with complex leaf shapes, anisohydric species (which keep stomata open for longer in dry conditions) and evergreen species to maximise effective capture of of pollutants.
4. Planting density should not impede airflow into the woodland once established.
5. Management should seek to maintain a closed canopy following establishment (an unplanted strip will need to be maintained to allow for access to overhead utilities).

7.0 ACCESS

7.1 Relevant Local Plan Policies

7.1.1 The following sections summarise the findings of the ES topic chapters together with the non-EIA assessments and mitigation documents that are provided as supporting documents to the DNS application.

The Adopted Unitary Development Plan

7.1.2 The key Unitary Development Plan (UDP) policy relating to access is:

- GDP1: requiring amongst other things the built development is located where there is convenient access to public transport and is well related to pedestrian and cycle routes where possible.

The Previously Adopted (now unadopted) Local Development Plan

7.1.3 Relevant policies in the now unadopted Local Development Plan (LDP) include:

- SP12 Transport and Accessibility: which seeks amongst other things to enhance the overall reliance of the network, to ensure new development provide adequate levels of car parking taking consideration accessibility to existing public transport facilities and to the walking and cycling network, and to deliver safety enhancements to the local highway network.
- DM1 Development Management Considerations: requiring amongst other things that development must be safely and conveniently accessible on foot, bicycle, by public transport and by car.
- T1 Managing Transport Impacts: requiring that amongst other things, development does not have an adverse impact on highway safety.
- T2 Active Travel: requiring that amongst other things walking and cycling infrastructure is an integral part of the overall design of the scheme.

7.1.4 In relation to these policies, there are public transport links running through Chirk (both bus and rail). Employees can access the Kronospan Facility both on foot and by bicycle (and there are on-site cycle storage facilities), and this would continue to be the case should the Proposed Development be implemented.

7.2 Access to the Proposed Development

7.2.1 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 (Heavy Goods Vehicle).

7.2.2 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.

7.2.3 Once constructed, the 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 as the main site entrance for the operation phase of the Proposed Development.

7.2.4 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.

7.2.5 Those persons travelling to the Proposed Development for work would be able to use existing public transport (with several bus stops along the B5070), cycle storage within the Kronospan Facility, existing car parking at the Kronospan Facility, or the proposed weighbridge car park.

7.2.6 The Proposed Development would not be publicly accessible; the non-public facing/operational/manufacturing aspects of the existing Kronospan Facility is located behind a security fence. Controlled gated access is provided from the existing weighbridge and would also be provided from the proposed North Access Road weighbridge car park. Access to the operational parts of the Kronospan Facility would be heavily controlled for safety reasons, with protocols to ensure the safety of employees and visitors. Once within the Kronospan Facility (including the Proposed

Development), vehicles and pedestrians would be segregated via clearly demarcated routes.

7.2.7 All existing entrances and exits would continue to be maintained by the Applicant to ensure the health and safety of employees and visitors, and the efficient and effective circulation of vehicles and pedestrians within the existing Kronospan Facility.

7.2.8 The new buildings that would form part of the Proposed Development would accord with Part M of the Building Regulations. When approaching and entering proposed buildings, there would be level access with a finished floor level of 0.15m above the adjacent ground; this is necessary to accord with Part C of the Building Regulations as well as Part M. Within the buildings, sufficient clear widths would be provided to door openings to meet current Building Regulations and level door thresholds would be incorporated throughout.

8.0 SUMMARY AND CONCLUSION

8.1.1 This DAS has been prepared to accompany a DNS application under Section 62D of the Town and Country Planning Act 1990 made by Kronospan Limited for the construction and operation of a Low Carbon CHP Facility on land at the existing Kronospan Facility, Chirk, North Wales.

8.1.2 This DAS provides a description of the relevant design and access issues in respect of the Proposed Development. The level of detail provided is considered to be appropriate and proportionate to the nature and complexity of the scheme.

8.1.3 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).

8.1.4 The proposed Low Carbon CHP Facility would process up to 293,000 TPA of waste wood and forestry residues as feedstock for the existing Kronospan Facility.

8.1.5 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.**

8.1.6 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.

8.1.7 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.

8.1.8 The feedstock 'remainder' scenario set out above is considered feasible and reasonable. 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.

8.1.9 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.

8.1.10 The proposed Low Carbon CHP Facility would help to significantly decarbonise Kronospan's wood product manufacturing processes and make a valuable contribution to meeting the Welsh Government's Net Zero commitments. **T**he 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.

8.1.11 An early site search exercise was undertaken in 2022 based on a proposed Low Carbon CHP Facility that would be able to provide all power (electrical and thermal) needs for the existing Kronospan Facility; following an appraisal (against four key parameters), Site 5 was selected as the preferred location for the proposed Low Carbon CHP Facility as it is the most suitable option for Parameters 1, 3, and 4 and the joint most suitable (together with Site 6) for Parameter 2. The recycling of the land (which would be vacated by the existing Gas Turbines 1 and 2) is a more efficient and sustainable use of land than other site options.

8.1.12 Two core layout options were identified that were capable of achieving 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 tonnes per annum).

8.1.13 Core Layout 2 provided at **Inset 6.3** was selected as preferred and formed the basis of the design as it was deemed to offer the most opportunity to minimise the potential for adverse environmental effects.

8.1.14 The height of this stack has been carefully 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 with increased stack height. Subsequently, the stack height has reduced from an initial height of 95m to a proposed height of 75m.

8.1.15 To examine the potential implications of different cladding colours on the proposed CHP Building, a Colour Study has been undertaken which examines the potential for a reduction in the visual effects of the proposed Low Carbon CHP Facility that might be achieved by substituting the Goosewing Grey cladding with alternate colours. Goosewing Grey cladding remains the most appropriate colour for the proposed CHP building as it would provide the least contrast with existing structures at Kronospan, and thus the proposed CHP Building would look the least distinct if this colour cladding is utilised.

8.1.16 Biodiversity mitigation and enhancement measures will be implemented to increase the resilience of the ecological habitats to air quality impacts. This includes new native woodland planting adjacent to existing woodland to the west of the canal corridor, and further new native woodland along the eastern side of the minor road (Llwyn-y-Cil) which forms the eastern boundary to the Chirk Castle Estate.

8.1.17 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.

8.1.18 Once constructed, the 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 as the main site entrance for the operation phase of the Proposed Development.

Annex A – Indicative 3D Model of Proposed Low Carbon CHP Facility

Existing – View from Southeast

Proposed – View from Southeast

Existing – View from East

Proposed – View from East