

9.4 Written summaries of oral submissions put at Issue Specific Hearing 1

PINS reference: EN010116

December 2022

Revision number: 0



1. INTRODUCTION

- 1.1 The Development Consent Order (**DCO**) application for the North Lincolnshire Green Energy Park (**Application**) was submitted on 31 May 2022 and accepted for examination on 27 June 2022.
- 1.2 The first Issue Specific Hearing (**ISH1**) for the Application was held in person at Forest Pines Spa and Golf Resort, Ermine Street, Broughton, Brigg, DN20 0AQ on Wednesday 16 November 2021 at 10.00am.
- 1.3 The Examining Authority (**ExA**) invited the Applicant to respond to the matters raised at ISH1 and the Applicant confirmed it would respond in writing after the hearing.
- 1.4 This document seeks to fully address the representations made by the Interested Parties at the ISH1.
- 1.5 The Applicant has responded to the issues raised by each attending party and provided cross-references to the relevant application or examination documents in the text below. The document is supported by the following Appendices:
 - 1.5.1 Appendix 1 – Waste Composition Assumptions Made to Enable Carbon Balance Assessment – 30 November 2022; and
 - 1.5.2 Appendix 2 – Note on Carbon Capture and Energy Efficiency

2. THE APPLICANT'S SUBMISSIONS IN RESPONSE TO MATTERS RAISED AT ISH1

Ref	Questions / Issues Raised at ISH1	Summary of Applicant's Response at ISH1	Applicant's Written Response
Agenda Item 3: Need for Principal Development			
1.	The Examiner asked about the need for the Proposed Development in the context of Government Policy and emerging Government Policy.	<p>The Applicant explained that policy need and compliance with policy is dealt with in the Planning Statement – APP-035. The Applicant gave an overview on the Applicant's position on need to assist the Examining Authority.</p> <p>NPS EN1 (Overarching Policy Statement for Energy) is clear on the need for new nationally significant energy infrastructure projects and that this need is urgent.</p> <p>NPS EN1 is also clear that the ExA should assess applications covered by the energy National Policy Statement's (NPS) on the basis that the Government has demonstrated that there is a need (para 3.1.3 of NPS EN1). It is not for this examination to test this need.</p> <p>Substantial weight should be given to the contribution that the project would make towards satisfying this need (para 3.1.3).</p> <p>Government has made a legally binding commitment to achieve Net Zero by 2050 and decarbonisation of the electricity sector by 2035. These targets cannot be achieved without a step change in action.</p> <p>It is abundantly clear that we need to do more in order to meet our legally binding net zero targets. The National Audit Office in their 2020 report entitled Meeting Net Zero described the challenge as "colossal".</p> <p>The latest Climate Change Committee (CCC) Progress Report (June 2022) concluded that the UK was a world leader in targets, but despite important achievements in renewable energy and electric vehicles, the Government is failing in much of its implementation. It emphasised in the foreword that "it now has to deliver on the scale and urgency that is required".</p> <p>More recently, Government published the British Energy Security Strategy (BESS) April 2022. The BESS was published in response to the rapid rises in energy bills, partly as a result of rising global energy costs after COVID-19</p>	The Applicant has no further comment.

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		<p>and partly from of the war in Ukraine. The BESS has a number of key themes, many of which are addressed by the Project, including:</p> <ul style="list-style-type: none"> • Reducing the UK's vulnerability to international oil and gas prices, by reducing our dependence on imported oil and gas. • Accelerating the transition away from oil and gas and exposure to volatile fossil fuel markets by increasing the roll out of new renewables. • Building a British energy system that is much more self-sufficient. • Investing in nuclear power, hydrogen and Carbon Capture Utilisation and Storage. • Accelerating the shift to zero emission vehicles, sustainable aviation fuel and green shipping. <p>So, the need for low carbon and renewable energy has never been clearer.</p> <p><u>The specific need for the ERF</u></p> <p>In the context of EN3, the facility will be R1 compliant (R1 rating of 0.747 is well above 0.65 required to be defined as an ERF) and so will be classed as an Energy Recovery Facility for the purposes of the Waste Framework Directive (2008/98/EC).</p> <p>NPS EN1 recognises the important of role of Energy from Waste (EfW) in delivering predictable peak load and base load electricity (para 3.4.4 NPS EN1).</p> <p>NPS EN1 also recognises the benefits in having a diverse mix of energy generation (para 3.3.4 NPS). ERF is a dispatchable (partially) renewable supply.</p> <p>Need is growing as more electricity generating plants close – e.g. coal-fired plants and nuclear power stations – all existing nuclear power stations other than Sizewell B are scheduled to close by 2028 with Hinkley Point C (and Sizewell C) some way off generation.</p>	

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		<p>This comes with increases in electricity demand – e.g. through decarbonisation of transport sector.</p> <p>Government policy (Net Zero) is clear that the electricity sector needs to decarbonise first (2035), therefore there will be a growing emphasis on production of low carbon and renewable energy.</p> <p>NPS EN3 recognises the role of EfW generating stations in taking fuel that would otherwise be sent to landfill (NPS EN3 para 2.5.9).</p> <p>NPS EN1 also confirms that energy recovery from residual waste has a lower GHG impact than landfill (para 3.3.33).</p> <p>Looking at the competition, there are 35 out of existing 48 operational facilities that have R1 status.</p> <p>Current fleet of projects in operation and under construction is insufficient to meet projected residual waste volume (which assumes recycling targets are met) – at national and regional level.</p> <p>The Applicant recognises that if all consented pipeline projects were built there would be potential over-capacity (both regionally and nationally), but it is unlikely they will all proceed. The market will ensure that projects are unlikely to proceed to financial close without certainty on waste supply. For example, the Runcorn decision is an example of a development making no progress or abandoned post consent.</p> <p>The Net Zero Strategy includes a decarbonised electricity grid by 2035. Considering only facilities/projects which have announced CCS plans or are geographically advantaged for CCS demonstrates a clear capacity gap.</p> <p>Some facilities will reach the end of their lifetime and/or become non-viable when the cost of carbon emissions is internalised. Some may lose contracts to competitors like the ERF that are able to offer a better carbon performance for ESG/NetZero reasons.</p>	

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		<p>The potential of delivering a carbon-negative energy recovery option delivers a significant need for local authorities wanting to establish a low carbon waste management strategy. It is expected that some carbon-negative generation will be needed to fully decarbonise the grid by 2035.</p> <p>The Applicant proposes to update the APP-036 RDF assessment and submit this by Deadline 1. The reason for the update is more recent waste data for 2020 and 2021.</p> <p><u>Emerging national planning policy</u></p> <p>The Applicant notes that there are a number of draft NPSs in existence. These draft NPSs continue to recognise the importance of low carbon and renewable energy projects. In addition, the House of Commons BEIS Committee report (February 2022, see paragraph 3.2.7 of the Planning Statement [APP-035]) recognised the need for the draft NPSs to be even stronger to achieve the legally binding Net Zero targets.</p> <p>The current status of draft NPSs is as follows:</p> <ul style="list-style-type: none"> • Published in September 2021. • House of Commons Select Committee commented in February 2022. Generally endorsed, but said policy should be stronger to ensure that Net Zero was met. • Revised drafts expected but not yet available. • Can place weight on as statement of Government intent, but not yet weight of Government policy. <p>In respect of the draft NPS EN1 this continues to recognise role of EfW, noting that only waste that cannot be re-used or recycled with less environmental impact and would otherwise go to landfill. In respect of the Applicant, the Applicant is committing to residue RDF only.</p> <p>In respect of the draft NPS EN3, there are new paragraphs on waste treatment capacity - Applicants must demonstrate that proposed EfW plants are in line with DEFRA's policy position on the role of energy from waste in treating municipal waste (para 2.10.4). The proposed plant must not result in</p>	

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		<p>over-capacity of EfW waste treatment at a national or local level (para 2.10.5).</p> <p>The Applicant started with the central principle of delivering a truly sustainable scheme. Not just an ERF. Additional elements are included to address Government policy and ensure that the Scheme is sustainable on a number of levels.</p> <p>Recycling is at the heart of Government waste policy. The waste hierarchy (referenced in EN1 at para 5.14.2) sets out clearly that the priorities for managing waste must be applied as follows:</p> <ul style="list-style-type: none"> • Prevention • Preparing for re-use • Recycling • Other recovery including energy recovery; • Disposal. <p>RDF will be purchased in bulk and will include an element of plastic materials which are capable of being recycled but nevertheless usually end up being recovered through the ERF. By delivering the plastic recycling facility (PRF) as part of the Project, the Applicant will be able to ask the RDF to be source segregated where feasible and enable the recycling of plastics that would otherwise not be recycled.</p> <p>DEFRA have set out objectives to eliminate the export of plastics by 2027 which will require additional capacity to manage the 2.5m tonnes currently exported. The UK capacity to recycle this volume of plastic is not operational.</p> <p>The current plastic separation and recycling technologies do not facilitate the recycling of all types of plastic. A co-location of a plastic recycling facility with an ERF that can recover energy from the non-recyclable fraction will increase the volume of waste plastic that can be recycled. As technologies develop and the commercial viability increases, more plastics can be recycled.</p>	

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		<p>The ability to utilise the process residues in the manufacture of concrete products on site improves the environmental benefits of the recycled plastic.</p> <p>The North Lincolnshire Council Core Strategy 2011 (CS20) states that new and enhanced facilities for the treatment and management of waste will be located at five broad locations, including Flixborough Industrial Estate.</p> <p>The Draft Local Plan has now been submitted for examination – November 2022.</p> <p>The ERF is located principally within an existing employment site allocation.</p> <p>The Emerging Local Plan (Regulation 22 draft) WAS1 makes clear that development that encourages and supports the minimisation of waste production and the re-use and recovery of waste materials will normally be supported.</p> <p>Regulation 22 draft policy WAS2 can be summarised as requiring new waste management facilities be located in sustainable locations that are appropriate to the proposed waste management use and its operational characteristics, and where impacts on the community and the environment can be avoided or addressed appropriately, new EfW facilities will be supported provided that they meet specified criteria, including that they follow a sequential approach to site selection, including on employment sites. All proposals need to meet criteria including that there is a need for the facility.</p> <p>Draft Policy WAS3 sets out the principle of net self-sufficiency in waste management.</p> <p>Local Waste Needs Assessment 2020 was prepared as part of the evidence base for the draft Local Plan. It identified that there would be a residual capacity of Local Authority Collected Waste (LACW) of 24,715 tonnes in 2020 (after recycling and recovery is allowed for) falling to 10,827 in 2038. Note this assumes an increase in recycling to 65%.</p>	

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		<p>However, the LWNA 2020 also notes that two existing landfill sites are due to close in the mid-2020s (Roxby) and 2030 (Crosby) respectively. This will result in 925,000 tonnes of permitted LACW landfill capacity being lost.</p> <p>The LWNA also notes that North Lincs currently receives substantial amounts of imported waste from other local authorities in Lincolnshire. Two million tonnes comes in, some of which is exported. If this continues, there will be a significant shortfall in landfill capacity over the plan period.</p> <p>There are some aged plants and some with low efficiency that can't deliver carbon capture use and storage. There will be a falling away of some of the existing capacity as well as a drop in competition. In the RDF supply report the Applicant has made some projections of the drop in capacity. The Applicant has also looked at the effect of increasing the rate of recycling to hit the 2035 target for England of 65% and also a sensitivity analysis with the 68% recommended by the committee on climate change alliance.</p> <p>Currently the rate sits around 45%, so an increase to 65% would be quite significant. Nonetheless that is what we've modelled. It is worth suggesting there may be a shortfall and if there is no other capacity those wastes will go to landfill. We expect a capacity gap by 2035 of approx. three million tonnes for England as a whole.</p>	
2	Simon Nicholson queried the point made that the capacity of incinerators would be reducing because of natural wastage end of life and not creating further capacity. He asked if this includes proposed projects or just existing projects	The Applicant explained that it had looked at the increases of capacity from plants that are in commissioning and under construction as part of the model considered. The Applicant explained that there would be net growth in the fleet in the period up to 2035 as additional capacity was coming along.	The Applicant has no further comments.
3	The Examiner stated that the Applicant's answer to Simon Nicholson's	The Applicant explained that the current fleet's capacity will decline because some plants will close. However, there will be new additional plants to the fleet which are being commissioned or in construction. There will be growth in	The Applicant has no further comment.

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	question regarding capacity of incinerators contradicts what the Applicant said before where they suggested that capacity was declining. The Examining Authority asked for clarification on this point.	capacity to the fleet but not all the fleet available in 2022 will continue to provide capacity.	
4	The Examiner stated that the Applicant was making a lot of references to a document that no one had yet seen. The Examiner made a point that this must be revisited at a later date when everyone has had the opportunity to read the document. The Examiner further stated that the document must make clear the various time frames that are involved in expectations of capacity rises in plants under construction or in processes of planning at same time of analysing those plants which are heading towards decommissioning etc. so balance lies with capacity. Where in the country that capacity is and particularly defining by what the Applicant means	The Applicant explained that the intention is for APP-036 , the current RDF assessment, to be updated for Deadline 1. The assessment will follow the same format and update taking the same approach with updated statistics.	The Applicant has no further comment. Updated document (APP-036) has been submitted at Deadline 1.

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	as Yorkshire, Humber and East Midlands and where North Lincolnshire sits in that as no plan shows that clearly so far.		
5	The Examiner stated that the document possibly needs to go slightly further. There is currently no plan in the document defining areas for Yorkshire, Humber and East Midlands which is framing your arguments. Needs to go further in providing clarity.	The Applicant confirmed that the requested plan would be included.	The Applicant has no further comments. The plan referred to by the ExA is included in the updated APP-036 submitted at Deadline 1.
6	Simon Nicholson asked about proposed developments and whether they were included in what the Applicant was saying. Did these include just those under construction or those in the pipeline?	The Applicant recognised the need to be clear about a complex situation about types of waste, how they're managed and capacity they currently report to. The DCO needs to be abundantly clear and the Applicant expects to answer questions on that when provided. Yes, those facilities in the pipeline from very first prospect of project are dealt with in the report but separately. This doesn't necessarily mean in due course they will not provide capacity - very large scale projects have been built but then closed so that capacity is lost so there is still uncertainty on those projects that are in the pipeline. Report makes it clear there are categories of the EFW facilities.	The Applicant has no further comments.
7	Josh Downen (on behalf of UNWIN) questioned the Applicant's need case. The Applicant's current RDF APP-036 assumes that the maximum	The Applicant explained that Government policy is for recycling to rise to 65% which is why it is the case that the Applicant has modelled using this. The Committee on climate change is fairly bullish in changes it has suggested to policy and has recommended a target of 68% which is why we have looked at that as the sensitivity case in RDF report. The Applicant will look at the document Josh Downen has suggested and will make a judgement on whether	The Applicant has no further comments.

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	<p>recycling rate is 65% and doesn't consider the proposed impact of the target of waste sent to landfill or incineration in which the Government said would be 70-75%. 68% recycling is the statistic used by the Applicant. Is it the Applicant's need to produce to meet the new target? Emerging targets are in the Government consultation document: Environmental Targets and Associated Impact Assessment. The Examiner asked Josh Downen to include clear reference to those documents when submitting his submissions. The Examiner instructed Josh Downen to point out relevant sections and provide detail of the document itself. Josh Downen informed the Examiner that this document is publicly available on DEFRA website.</p> <p>Josh Downen then questioned Air Products</p>	<p>it suggests a further case helpful to model but the Applicant made the point that we are currently at 45% (slight fall off) as a recycling rate in England and it has proved extremely difficult to get to 45% with considerable investment through waste infrastructure development programmes. There has been a lot of funding by DEFRA but the Applicant is unsure if funding is available to take us into the recycling rates proposed by the current Government policy but the Applicant can look at this.</p> <p>Air Products development plasma arc technology is still used in thermal treatment and in recovery tech – the facility was commissioned but Air Products chose to close it for commercial reasons. Point made by the Applicant is that just because infrastructure does become operational doesn't mean it provides capacity in the medium or long term.</p>	

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	capacity. Josh Downen asked whether he was correct that plasma technology is not being used?		
8	Simon Nicholson queried the Applicant's point regarding the import of waste into local area that would be going to landfill. Simon Nicholson asked the Applicant if they were aware that this will be drastically reduced by 2024/5 when the three million cubic metres that currently goes to Roxby will be exhausted and no waste will be going there. Only relevant waste will be capping material which would not be landfill, incineration or export. Has this been considered in figures?	The Applicant explained that circa. 500,000 tonnes a year goes to landfill i.e. bottom of waste hierarchy and the whole policy approach is to push waste up the hierarchy to other waste management routes. It does close in 2024 but that waste will find a place higher up the hierarchy. By 2024 it looks for a new home in terms of a place that manages it.	The Applicant has no further comments.
9	Simon Nicholson said that the Government directive says waste produced should be processed locally. Most incoming waste that the Applicant has discussed is coming from all 4 corners of UK. Once that's into Roxby tip that's not local. If waste is	The Applicant confirmed that the proximity principle derives from the Waste Framework Directive and is a national need for self-sufficiency, not a local one.	The Applicant has no further comment.

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	<p>treated local to where it is then that destroys the Applicant's argument. Consideration must be given to adherence to waste proximity and the Applicant doesn't adhere to Government policy.</p>		
10	<p>Simon Nicholson raised the point that Lincolnshire in its rural location has been treated as the "dirty man of the UK" for many years as it has historically had many landfills with waste coming from outside the area. It is policy that once landfill is finished at Roxby, then as we are such low producers of own waste, why should we be harbourers of other's waste? The amount of excess waste that isn't going to landfill is a very small proportion so amounts of fuel provided locally would be minimal.</p>	<p>The Applicant explained that it would be helpful to observe the amount of capacity in North Lincolnshire for management of waste.</p>	<p>The Applicant has no further comment.</p>
<p>Agenda Item 4: The components</p>			

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11	<p>The Examiner stated that it was important to understand how the elements fit together – on the ground and in the DCO authorised development and associated development. The Examiner also flagged that there were different descriptions of the authorised development in the Application. For example in the application form, the draft DCO and ES Chapter 3.</p>	<p>The vision, as set out in the Design and Access Statement (APP-037) for the North Lincolnshire Green Energy Park is for it to be a hub for low-carbon and renewable energy generation, set within a sustainable landscape of wetlands and woodland corridors. The Green Energy Park will act as a catalyst for regeneration of the Flixborough Industrial Estate, and other existing and proposed development, providing a source of jobs and facilitating the transition to low-carbon living through research and education.</p> <p>It will manage waste in a more sustainable way. Instead of burying it, the waste will be turned into energy to power and heat local homes and businesses. The by-products from processing the waste will be captured and re-used, ensuring minimal waste goes to landfill.</p> <p>The Green Energy Park is made up of a number of components, the distribution of which are shown on Figure 3.1 (Energy Park Components) of the DAS (APP-037), with the limits of deviation for each part shown on the Works Plans (APP-017, App-018 and AS-009) and described within Schedule 1 of the draft DCO (AS-006).</p> <ol style="list-style-type: none"> 1. At its core is the Energy Recovery Facility (ERF) (numbered 1 on Figure 3.1 (Energy Park Components) of the DAS (APP-037) will combust Refuse Derived Fuel (RDF) which will be delivered to the ERF via a combination of three transport options, including: <ol style="list-style-type: none"> a. By road which involves the construction of a new access road connecting Flixborough Industrial Estate with Ferry Road West, where a new roundabout will be constructed, providing the gateway into the Green Energy Park and Flixborough Industrial Estate beyond. b. By rail through the reinstatement of the railway and provision of a new railhead and sidings at Flixborough and new sidings at Dragonby. c. By River through the use of the existing Flixborough Wharf. No improvements works are required to the Wharf to 	<p>The Applicant will address inconsistencies in the documents in response to the ExA First Written Questions.</p>

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		<p>accommodate barges transferring RDF along the River Trent.</p> <p>The proposed routing of the RDF to the ERF are shown on Figures 5.17, 5.18 and 5.19 of the DAS (APP-037).</p> <p>To deliver the project vision and ensure minimal waste goes to landfill, there are a number of associated facilities which will process the by-products from processing the RDF, these include:</p> <ol style="list-style-type: none"> 1. Carbon Capture, Utilisation and Storage Plant (numbered 2 on Figure 3.1 (Energy Park Components) of the DAS (APP-037) located adjacent to the ERF building. Combustion gases from the ERF will be diverted through this facility for treatment and CO2 removal prior to being emitted through the ERF stack. The facility will contain the equipment needed to capture the CO2 and store it on site before it is used on site, shipped off-site or removed by train or road vehicle. 2. Residue Handling and Treatment Facility and Concrete Block Manufacturing Facility (numbered 3 on Figure 3.1 (Energy Park Components) of the DAS (APP-037). This facility is located immediately to the south of the ERF. The residues consisting of bottom ash and flue gas treatment residue from the ERF will be transported by an enclosed elevated conveyor belt, where it will be processed into useful aggregates, such as concrete blocks. 3. Plastic Recycling Facility (numbered 4 on Figure 3.1 (Energy Park Components) of the DAS (APP-037) will enable up to 25,000 tonnes of plastics to be recycled rather than recovered through the ERF. The source segregated plastics will be processed and reformed into plastic pellets/flakes that can be used to manufacture new plastics products. <p>In addition to these facilities, the following facilities have also been incorporated into the Project to maximise the efficient use of the heat and power generated by the Project. These facilities include:</p>	

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		<ul style="list-style-type: none"> • District Heat and Private Wire Network – this will consist of 11km of buried pipework and cabling that is capable of delivering heat and power generated by the ERF to the other facilities within the Energy Park as well as potentially delivering heat and power to local commercial and residential off takers around the northern and western edges of Scunthorpe as identified in the Combined Heat and Power Assessment (APP-038). The DHPWN will run south along the new access road and along Ferry Road West before splitting in two branches. One branch will run east within the A1077 into Scunthorpe to the existing substation and the other branch will run south within the agricultural fields to the west of the A1077 and M181. Full extents of the DHPWN are shown on Works Plans B (APP-017). • Hydrogen production facilities (numbered 6 on Figure 3.1 (Energy Park Components) of the DAS (APP-037) – There will be up to two hydrogen production facilities, one located in the north and one in the south. The hydrogen will be used to power hydrogen-fuelled vehicles, injected into the gas grid or used as a back-up fuel to support the district heat network, displacing natural gas. The hydrogen production facilities have been located adjacent to the gas mains and both include above ground infrastructure that will enable the injection of hydrogen into the gas grid. • Electric Vehicle Charging and Hydrogen Re-fuelling station (numbered 7 on Figure 3.1 (Energy Park Components) of the DAS (APP-037) – This is located on the junction of the new access road and Ferry Road West. This facility will be powered by the electricity generated from the ERF and the hydrogen produced by the southern hydrogen production facility. • Battery Storage Facility (numbered 5 on Figure 3.1 (Energy Park Components) of the DAS (APP-037)– This facility has been located adjacent to the Electric Vehicle Charging and Hydrogen Re-fuelling. It will be supplied with power by the ERF and the electrical grid and will be used to store power for use in EV charging and other facilities within the Green Energy Park as well as providing grid services. This 	

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		<p>facility increases the self-consumption of power within the Green Energy Park.</p> <p>All of these facilities will be set within a new multifunctional landscape as illustrated on Figure 5.8 (Illustrative Masterplan) of the DAS (APP-037). The landscape masterplan has been designed to integrate the infrastructure and buildings into the landscape</p> <p>. The landscape proposals are capable of delivering wider green infrastructure benefits, for example:</p> <ul style="list-style-type: none"> • New woodland that provides screening in the north, which form part of connective habitats and provide an appropriate setting to new and existing rights of way. • A new wetland that will manage surface water drainage from the facilities within the green energy park, providing a variety of features such as ponds, swales and ditches, planted and managed to improve the quality of surface water run-off, and a mosaic of habitat types capable of supporting a wide range of ecological species • Improved access and permeability through the provision of a series of new paths that provide additional walking and cycling routes for the local communities. The network of the new paths is shown on Figure 5.25 within the DAS (APP-037). <p>Set within this multifunctional landscape is the Visitor Centre, located at the northern end of the wetland, connecting the ERF and associated facilities with the wetland.</p> <p>The visitor centre will provide a first point of contact for visitors and local people and will provide training, security screening and waiting facilities. The visitor centre will provide controlled access to the elevated walkway so that visitors and staff can gain access to the buildings safely and securely away</p>	

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		from the movement of HGVs. The movements of the staff and visitors is shown on Figure 5.26 of the DAS (APP-037).	
12	Simon Nicholson asked a question regarding recycling plastics on site. Where are the plastics going to come from?	<p>The Applicant explained in terms of the precise source, unless and until consent is secured for the scheme, there will be no contracts in place. Generally, it will come from the suppliers of the RDF, so there is an ability to recycle as much plastic as possible.</p> <p>The waste processing tends to blend plastics waste with residual municipal waste – the intention is to provide the opportunity to separate out plastics as much as possible.</p>	The Applicant has no further comment.
13	The Examiner asked if segregation will not happen on this site, will it happen elsewhere and then come to NLGEP for reprocessing?	The Applicant responded that the Examiner is correct.	The Applicant has no further comment.
14	Simon Nicholson asked if plastics are segregated before arrival on site, how will they be transported and where will they be stored? In addition Simon Nicholson stated that the Applicant is trying to do a lot of things on the same site but plastics seem to be an anomaly. Simon Nicholson believed that that receiving product from outside to process onsite makes the project more fanciful.	The Applicant explained that in terms of storage, there is a building proposed for the plastic recycling facility and the Applicant has included maximum parameters at this stage for the Application. The Applicant wouldn't know the tech provider for this process yet and would incorporate room for storage for imported segregated plastic material. The Applicant states overall tonnage at plastic recycling facility is capped at 25,000 tonnes per annum. This is a much smaller quantity compared to EFW.	The Applicant has no further comment.
	The Examiner asked how do each of the elements	The Applicant displayed an overall process flow diagram on screen. The Applicant stated that the CCS is integrated into the ERF, receiving heat,	The Applicant has no further comment.

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	link with the rest of the Project?	<p>power and flue gas from the ERF. A portion of the flue gas from the ERF is treated via an amine capture process to remove carbon dioxide. Captured carbon dioxide is intended to be used within the wider energy park and exported to off-site users.</p> <p>The RHTF and CBMF take residues from the ERF and processes these, producing an aggregate which can be used to produce concrete blocks. The RHTF requires carbon dioxide as part of the process, which is drawn from the ERF carbon capture facility. The aggregate produced in the RHTF is used in the CBMF to produce concrete blocks. Electricity for the RHTF and CBMF will be drawn from the ERF via the private wire network.</p> <p>The plastics recycling facility will reduce the quantity of recyclable plastics processed by the ERF. Any material unsuitable for processing in this facility will be re-exported to the ERF.</p> <p>A district heating and private wire network will allow for the direct export of electricity and power from the ERF, displacing local fossil fuel usage for heating and reducing demands on the local electricity grid.</p> <p>The hydrogen facility and battery storage will increase self-consumption of electricity within the wider facility. These facilities will also allow for short- and longer-term energy storage, reducing reliance of the national grid on fossil fuels for grid support. Including for both hydrogen production and battery energy storage facilities increases flexibility in energy storage and the resilience of energy export from the ERF.</p> <p>Two hydrogen AGIs and two electrolyser areas have been included within the scheme. The two AGIs allow for connection to different pressure gas mains, increasing the flexibility of the scheme to connect where capacity is available. The southern electrolyser will be constructed to provide hydrogen to the vehicle refuelling facility (Work No 8). If hydrogen injection to the gas grid is feasible, and capacity is available in the gas main in the south of the site, the southern AGI will be constructed. If there is not sufficient capacity in the</p>	

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		southern gas main and hydrogen injection is feasible, the northern AGI and electrolyser will be constructed (Work No 7).	
	Josh Downen asked if the Applicant is applying for an "all or nothing" development, or applying for the right to only develop some elements?	The Applicant explained that Schedule 1 sets out the authorised development, then other associated development that will form part of the project. Schedule 2 sets out the requirements. Requirement 2 provides that the authorised development must not be provided until the Applicant has set out phasing for the whole development, which needs to be signed off by the relevant local planning authority. The Applicant needs to comply with that approved phasing plan. In addition there is also requirement 14, which secures provision of the new access into the site. The Applicant cannot do Energy Park works or Railway Reinstatement Works until the road has been constructed to base course level. Requirement 18 also provides for the timing of delivery of the carbon capture element and CBMF. Requirement 18(2) provides that the carbon capture storage must be constructed and commissioned within six months of the ERF. CBMF must also be constructed and commissioned within 12 months of the carbon capture facility.	The Applicant has no further comment.
15	Simon Nicholson queried the point made by the Applicant that no construction would start before the base course of the road has been laid. Simon Nicholson asked if he was correct in thinking that the base course was not the finished surface.	<p>The Applicant explained that the road would be fully constructed to base course level.</p> <p>The base course is the course below the wearing course which is the final finish. It is normal practice to take it to base course during construction and then finalise the road once construction has completed.</p>	The Applicant has no further comment.
16	Simon Nicholson stated that at the original public hearing in 2021 in Burton upon Stather, the question was asked three times, what would be the timescale of opening all the facilities. It was assured by the Applicant	<p>The Applicant explained that it was going to outline the timing of construction programme and phasing in order to respond to this question.</p> <p>The Applicant referred to the following documents:</p> <ul style="list-style-type: none"> • APP-061 es Chapter 13 - Traffic & Transport 	The Applicant has no further comment.


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	<p>that it would either be all or nothing – the incinerator would not be started unless everything else was ready to go. Simon Nicholson does not understand why such assurances were given and are not the case now.</p>	<ul style="list-style-type: none"> • Within the chapter is Appendix D which is the Outline Construction Logistics Plan. Within that Appendix D is a further Appendix C which is the Preliminary Phasing Plan. • APP-074 Code of Construction Practice • APP-051 Project Description, Section 6, Construction & Commissioning • AS-006 - Requirement 2(2) on Phasing & 4 on Soil Management in the draft DCO <p>The indicative construction programme, and associated phasing plan have been split into 6 summary phases containing details of sub phases & individual construction activities.</p> <p>For the initial submission it has been prepared using a timescale detailing year numbers & months</p> <p>The overall period is 1520 days (Circa 5yrs 10 months excluding public holidays)</p> <p>Phase 1 has 7 sub-sections (A-G) and is broken down as follows:-</p> <p><u>1A is estimated to be 350 days and includes the following works:</u></p> <ul style="list-style-type: none"> • Preparation of the contractors compounds, main and secondary, including car parks and welfare facilities. • Construction of the new perimeter road & B1216 road junction • Construction of the new Gate House <p><u>1B is estimated to be 244 days and includes the following works:</u></p> <ul style="list-style-type: none"> • Demolition works including the removal of the Northern & Eastern sheds and Bellwin House <p><u>1C is estimated to be 210 days and includes the following works:</u></p>	

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		<ul style="list-style-type: none"> • Stather Road service diversions <p><u>1D is estimated to be 240 days and includes the following works:</u></p> <ul style="list-style-type: none"> • New substation construction & export cable install to Scunthorpe North including modifications to existing substation <p><u>1E is estimated to be 270 days and includes the following works:</u></p> <ul style="list-style-type: none"> • Services installation, including District Heating pipework & Construction of the new main access road from Junction 3 to Stather Road <p><u>1F is estimated to be 300 days and includes the following works:</u></p> <ul style="list-style-type: none"> • Rail works including alterations to the existing Dragonby sidings, upgrades to the existing rail line & structures & construction of the connection to the ERF <p><u>1G is estimated to be 200 days and includes the following works:</u></p> <ul style="list-style-type: none"> • Flood alleviation measures to the Northern & Western flood bund & along First Avenue <p>Phase 1 in its entirety will have a duration of 700 days with 5 of the 6 elements running concurrently the exception being 1D, the export cable to Scunthorpe North substation</p> <p>Phase 2 comprises 2 sub sections, construction of the ERF & CCUS facility & construction of the visitor centre.</p> <p>The ERF & CCUS construction period is 1020 days with the visitor centre running concurrently for a period of 175 days. The overall period for this phase is thus 1020 days in total.</p>	

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		<p>Phase 3 is a single phase which involves the construction of the Residue Handling & Treatment Facility (RHTF). It has a duration of 340 days</p> <p>Phase 4 is a dual phase comprising of the construction of the Hydrogen & Gas above ground Installations (AGI) and the battery storage facility with a period of 280 days</p> <p>Phase 5 is again a dual phase which incorporates the construction of the Concrete Block manufacturing facility along with the plastics recycling plant. Total duration 325 days</p> <p>Phase 6 is another single phase which covers the remainder of the District Heating installation along the A1077, B1430, B1431 totalling 570 days</p> <p>Phase 7 Ecology & Environmental runs concurrently with Phases 1-3 inclusive</p> <p>The Applicant confirmed that the majority of the programme phases are currently primarily driven by the excavation process in each of the phased areas. This gives the best opportunity to resource level arisings & any imported material volumes. Detailed designs are of course some way off at this stage but early assessments have indicated arising volumes to be circa 577,000M3 so balancing suitable material re-use is of paramount importance.</p> <p>To confirm our final strategy a soil management plan (SMP) will be prepared as part of the Construction Environmental Management Plan (CEMP) in accordance of Requirement 4 of the draft DCO (AS-006), the outline SMP is currently detailed in Appendix J of the CoCP (APP-074).</p> <p>The final phasing of the scheme will be submitted to the local planning authority for approval in accordance with requirement 2 of the draft DCO (AS-006)</p>	
17	The Examiner asked will the phasing plan be worded in a way that	The Applicant confirmed that yes, it will commit the Applicant to the delivery of each of the elements. It will be phased in natural progression.	The Applicant has no further comment.

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	<p>commits the Applicant to the delivery of each element?</p>	<p>In terms of the main ERF, that forms part of Work No 1 (the NSIP). In terms of the key elements, we've dealt with timing of the delivery of the access road, CBMF and CCUS. In terms of use of the wharf, there are no physical works required to use the wharf. There needs to be interaction with Associated British Ports and RMS Ports but no physical works. The applicant confirmed that at this juncture we haven't committed to a precise set of timing for sequencing for the PRF, other than a requirement to agree phasing with the LPA. That is dependent on securing a relevant provider. In relation to the DHPWN the Applicant has referred to the proposed phased timing of that – elements associated with these will be delivered at the same time as the access road. But in terms of the route that will take us to the substation, we are dependent on the timing of the works Northern PowerGrid will need to do. We won't be in a position to operate the ERF until the cable has been provided. The DHPWN will happen at the same time.</p>	
18	<p>The Examiner raised that the DCO makes specific commitments and timings for concrete block manufacturing and carbon capture but doesn't go beyond that for various other component parts. It doesn't go into how the phasing plan shows that level of commitment. The Examiner would like to understand how the phasing requirement deals with that and that we can be confident of all the elements coming through and it all being delivered as a package. It is about how the Applicant can give assurance either through a draft document</p>	<p>The Applicant understood the Examiner's point and is happy to address this further.</p>	<p>The Applicant will address this point as part of its responses to the ExAs First Written Questions.</p>

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	or something else that gives everyone confidence the mechanisms are in place for delivery		
19	The Examiner asked whether the amount of plastic that will go through the energy recycling facility would be reduced if the plastic recycling facility is in place?	The Applicant confirmed that the Examiner had understood this correctly	The Applicant has no further comment.
20	The Examiner asked what evidence the Applicant is relying on that justifies that statement?	The Applicant explained that they can expect strong relationships between waste producers for both plastic waste and other RDF and if they are aware of the ability to deliver both segregated plastic waste and RDF to the same location they will be more likely to segregate the plastic wastes and not combine them with other treated RDF.	The Applicant has no further comment.
21	The Examiner queried that it doesn't quite follow that having a plastic recycling facility actually creates improved recycling and improved incineration content because if we are going to achieve these targets, aren't we going to have to do that anyway?	The Applicant confirmed that the Examiner was correct but one can expect strong relationships between waste producer, waste handler and the facility. The Applicant explained that you would expect that the parties involved would take advantage of a single relationship for the management of the variety of waste that would then be produced. There is a degree of speculation because we are dealing with the future and because plastic wastes aren't currently separated.	The Applicant has no further comment.
22	The Examiner stated that hydrogen injection is not currently allowed into gas system. The ExA asked if the Applicant knew what time frame is being investigated to look at this being an option that could	<p>The Applicant will respond to the Examiner with dates at a later date – There are current issues surrounding material science and compatibility with users in the gas grid. There are Government programmes looking at upgrading or creating a system so that they could take hydrogen.</p> <p>The East Coast Cluster incorporates a hydrogen pipeline. Regarding the hydrogen refuelling of vehicles, that is one alternative use, but would be</p>	FCE – the UK Hydrogen Strategy: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1011283/UK-Hydrogen-Strategy_web.pdf - page 70) sets out a programme for hydrogen injection into the gas grid, as shown below.

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	<p>occur and what weight can we attribute to this possibility in providing a report to the Secretary of State?</p>	<p>injected into the grid in the meantime. NLC in the longer term will be looking at things like hydrogen buses. The intention is this is a holistic scheme, encouraged by the Government. Until we have hydrogen vehicles or the ability to connect into the pipeline, we are looking into the future.</p>	<p>2.5 Creating a market</p> <hr/> <p> Key commitments</p> <ul style="list-style-type: none"> • We will set out further detail on the revenue mechanism which will provide funding for the Business Model in 2021. • We will establish a Hydrogen Regulators Forum in 2021. • We will assess market frameworks to drive investment and deployment of hydrogen, and provide an update in early 2022. • We will assess regulatory barriers facing hydrogen projects, and provide an update in early 2022. • We will complete an indicative assessment of the value for money case for blending up to 20 per cent hydrogen into the existing gas network by late 2022, and aim to make a final policy decision in late 2023. <p>An update was published in 2022 (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1092555/hydrogen-strategy-update-to-the-market-july-2022.pdf - page 13) which stated that the decision was still undergoing consideration. The earliest date available for hydrogen injection is 2025 according to this document (see extract below).</p> <p>Gas blending</p> <ul style="list-style-type: none"> • We continue to target a policy decision in 2023 on whether to allow up to 20% hydrogen blending (by volume) in GB gas networks, subject to the outcomes from ongoing economic and safety assessments and wider strategic considerations. • If the decision to proceed with blending is positive, we intend to start the legislative and regulatory process to enable blending, as well as the process to make any physical changes to distribution networks that are required. Given the timescales for this work, in the event that a decision is made in 2023 to allow blending up to 20% we do not anticipate blending at a commercial scale to commence before 2025 at the earliest. • We recognise the potential value of blending to support the early development of the hydrogen economy through providing a flexible route to market for hydrogen producers whilst the number of end users grows and hydrogen transport and storage infrastructure develops.
23	<p>Andrew Law asked to clarify why PRF is required if the source is segregated? He queried the link between the PRF</p>	<p>Waste management policy supports co-location of facilities to treat wastes. The Applicant has had regard to the guidance on associated development in defining the elements of the Scheme – paragraph 9 of the guidance encourages applicants to make a single application where there is a connection between components. Paragraph 6 of the guidance on associated development does refer to similar types of development that may well be</p>	<p>The Applicant has no further comment.</p>

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	and principal development.	located within the same scheme. The Applicant has also made reference to NPS EN-3, paragraph 2.5.15 which refers to the potential for waste transfer stations as being something that could sit alongside an ERF. The drivers and benefits are relevant. The number of PRFs currently in the UK is limited. The energy required for the PRF is derived from the ERF which is an additional factor and rationale for the co-location.	
24	The Examiner asked whether within the documents now, is there an explanation of the phasing arrangement the Applicant could point to?	The Applicant referenced documents at start of this agenda item covering the phasing arrangements.	The Applicant has no further comment.
Agenda Item 5: The composition of the waste to be used as fuel, the different terms used and the source			
25	<p>The Examiner asked the Applicant to provide an overview about the composition of the waste to be used as fuel and where it will be sourced from, what control will be in place to manage the content of the fuel, how the composition and sources might be expected to change over time.</p> <p>The Examiner reiterated that there was some discussion on this earlier but any additional material would be helpful.</p>	<p>The Applicant explained that there is inevitable uncertainty about waste arisings in the future that will become the fuel for the ERF.</p> <p>Waste composition is inherently variable, but reliably we know what are its main material components and their typical range in residual waste. If you sampled my household bin from one fortnight to the next they would differ, but overall there would be similarity. Applies more widely. The project has the ability to blend received wastes in order to meet appropriate fuel levels/specifications. In a dynamic market, we also have the ability to 'choose' where our waste comes from and therefore the composition of the fuel. Typical reported residual waste composition data for C&I and MSW were used where these were necessary in order to inform the assessment of the GHG balance for the facility. We have assumed that this composition will be altered by the implementation of policy measures focused on kitchen waste and plastics. The fuel composition was calibrated to the design calorific value of 14 MJ/kg.</p> <p>Needed assumed waste composition for GHG – drawn upon reported compositional analysis. Have taken those and assumed a 50/50 split in the waste received to the plant. Also assumed that there would be some removals from the waste stream. Can provide the compositional breakdown</p>	The Applicant has no further comment but refers to Appendix 1 of this document.

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		<p>for this analysis. The manipulation of the reported data includes policy changes we can see being made in future – including dealing with the food waste issue (less of this) and implementation of kitchen waste collections which is a key policy. The overall effect will be to reduce the overall residual food waste in the fuel delivered to the plant.</p> <p>This describes the fuel for the ERF. Wastes received to be managed by the PRF will be entirely different in nature. We would expect both a reduction in the use of single-use plastics in the economy and so an increase in the separate of end-of-life plastics for recycling. The effect of which would be to reduce the components of plastics we would see in the waste as well.</p> <p>The Applicant is in discussions with a wide range of potential fuel providers. Understandably, these conversations are confidential at this stage for commercial reasons. Nonetheless, the RDF supply assessment conducted by Afry provides the Applicant with confidence that there is sufficient residual waste currently exported or landfilled that its throughout can be met. A significant quantity of waste is currently exported through the Humber (c.0.3Mtpa). The North Lincolnshire waste contract is due to be renewed in the near future.</p> <p>Existing operators have expressed their interest in contractual relationships with the Applicant once the relevant permissions are granted.</p> <p>As a merchant facility, the ERF will be seeking other commercially-attractive sources of fuel, both in the short term and in the long term.</p> <p>The ERF will not be permitted to accept source-separated materials intended for recycling, as described below.</p> <p>Have also made assumptions re PRF – will see a reduction in the use of single use plastics and also more separation of end-of-life plastics for recycling which will reduce the plastic in the waste. In practice the facility would have the ability to select the waste by source with certain compositions. That may affect how business is done in the future. If there is low quality RDF that will be less attractive to the plant. The facility will be able</p>	

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		<p>to blend the waste it receives to smooth out differences in composition in order to try and achieve a relevantly consistent composition. The calorific value as a base is 14MJ per KG. The waste composition assumption for GHG analysis has come up with the same calorific value. In practice, the facility can deal with a range of calorific value of the fuel it receives, so waste does not need to be homogenous. The effect of that may mean that the amount of waste as the throughput may also vary.</p> <p>In terms of variation of the composition, the expectation is kitchen waste and plastic will fall.</p> <p>There is a focus on metal separation – they are valuable and there is quite a bit of separation already but still a residual amount. There will be a disproportionate focus on those due to their value.</p>	
26	Simon Nicholson queried the Applicant's comment regarding biomass and biomass for plastics in the future. Simon Nicholson questioned whether it not be the case that all biomass will not go to landfill but will be digested to make methane and used to generate electricity, taking it away from the need for incineration?	The Applicant explained that the use of biomass as a replacement source of material for a conventional plastic type of product. Eg a plastic bottle would be produced from biomass. It will still be recyclable and would be appropriate to send it a recycling facility.	The Applicant has no further comment.
27	Josh Downen raised a query regarding recyclable plastics, but thought the Applicant was	The Applicant was using the bioplastic bottle as an example for use of biomass, it is not to do with composition of the fuel.	The Applicant has no further comment.

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	talking about fuel for the incinerator?		
28	Josh Downen asked the Applicant if they would provide compositional breakdowns. Is it correct that the application has not provided this yet?	The Applicant explained that there were a set of topics and data that best dealt with greenhouse gas and climate change rather than decomposition of waste and the sources we are dealing with today but data will be available.	See Appendix 1 to this document.
29	The Examiner asked whether this data will be available at Deadline 1?	The Applicant explained that there will be a permit for the facility and will be a requirement to provide details annually of actual fuel. The Applicant queried what compositional waste information was required in addition to the assumptions and assessments in the ES.	The Applicant has no further comment
30	Josh Downen asked for more context referring to page 31 of the ES Chapter on Climate APP-054 , table 5. Josh Downen believed there was no explanation of where they ended up with the fractions, eg percentage of dense plastic etc.	<p>The Applicant explained that a certain amount of information has been provided. The Applicant suggested that if Josh Downen has a specific question, he should raise this in written representations or outside of the examination.</p> <p>The Examiner suggests that both parties have opportunity to discuss this together in a statement of common ground and can understand both parties' decisions in regard to precise detail. Whether it ends up being agreed or not, this will be a helpful line of conversation between the parties.</p>	The Applicant has no further comment.
31	Josh Downen queried that the Applicant said metals are valuable and that metals can be removed. In ES Chapter - Climate (APP-054) paragraph 5.4.2.13 states that ferrous metals will be removed, but does not refer to non-ferrous	The Applicant explained that the RDF will be sourced from a number of providers – some we know of and some we don't. Also, we are currently dealing with a theoretical waste composition.	The Applicant has no further comment

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	metals. Does the Application assume no ferrous metals will be removed, and the basis for this? Reference to the Enfinium Ferrybridge site – why is this RDF incinerator expecting so much more than Enfinium?		
32	Josh Downen asked if any rejects from the PRF are to be used on site?	<p>The Applicant explained that yes, they would expect there to be a reject rate from source segregated plastics received on site. There is always a reject rate for any materials received to any facility. Haven't taken into account that in the GHG assessment – only a maximum of 25,000 tonnes of plastics to be received and reject rate would be a small number and will be pretty insignificant amount of plastic to put back in the ERF and would not materially affect composition.</p> <p>APP-051 – Chapter 6 of ES – 3.2.3.9 assumptions are that approx. 24,000 tonnes would be clean and recyclable. Approx. 500 tonnes to be unsuitable material to be redirected to ERF.</p> <p>We don't know precisely where the waste will come from, but the application has been in discussion with a number of providers locally and had made good progress with MoUs re approx. half a million tonnes of fuel, with early discussions for a further 300,000 tonnes. So we have sight of this, but it's too early. It is pretty encouraging to know we have access to the fuel we need and some understanding of what the RDF will look like (not compositions) and the waste will be provided by someone comparatively local to the site.</p>	The Applicant has no further comment.
33	Councillor Elaine Marper asked the Applicant that if they are saying it will be comparatively local – what is the Applicant's	The Applicant will need to talk to the team and client about what can be revealed – risks commercial sensitivity – will do our best to provide some sort of plan within which those providers can be marked geographically.	The Applicant has no further comment.

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	<p>idea of this and north Lincolnshire? Previously kept referring to NE Lincs and we are not NE. Our impression of local and yours are different things.</p> <p>The Examiner anticipating amended RDF report will address number of these points?</p>		
34	<p>Simon Nicholson understands there is some variance in the volume of RDF the Applicant is planning to consume. Initial proposal 750,000 tonnes, but is now 650,000 tonnes. The Applicant stated now 800,000 agreed in MOUs. Clarify actual capacity required?</p>	<p>The Applicant explained that the 800,000 tonnes is a total amount of waste with which the Applicant is talking to providers about – it is access to fuel from a market, not the amount of fuel that will be provided. Discussions with providers are held a long time before contracts are entered into. Some of those potential MOUs, which are in development, may fall away. They may be a proportion of what a provider is dealing with. There is a lot of flexibility. Re design and throughput, need to hand over.</p> <p>ES Chapter 3 (APP-051) – paragraph 3.2.2.3 confirms that the overall capacity of the facility in waste tonnage terms is up to 760,000 tonnes. Figure not specific in the DCO, we need to refer to megawatt capacity.</p>	The Applicant has no further comment.
35	<p>The Examiner looks forward to receiving as much information as the Applicant is able to provide with regard to sources and location.</p>	<p>The Applicant explained that the calculated fuel composition for the GHG calculations is shown in the table displayed on the screen. This is based upon residual waste composition data for C&I waste in Wales (2019) and MSW in England (2017) on a 50:50 basis. The Applicant has adjusted this to take account of removal of some material as policy measures on kitchen waste and plastics are implemented and as a result of RDF processing, in order to deliver a calorific value c.14MJ/kg. The Applicant would rather describe this composition, and how it is derived, rather than hand over the</p>	The Applicant has no further comment

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		data and calculations, since that encourages manipulations which would be unhelpful.	
36	Josh Downen refers to Regulation 12 of the Waste Regulations 2011 – only applies on transfer to waste rather than collect etc.	<p>The Applicant will provide a copy of Regulation 12 as part of response and extent of that obligation and who it relates to and relates to any undertaking, recovers, collects and disposes. Links in with duty of care outlined in section 64 of the 1990 Act. The Applicant confirmed that it is a cradle to grave duty imposed on anyone who produces waste right through to anyone who disposes of the waste. Duty of care and this Regulation are ongoing, looking forward and attach to everyone who is dealing with waste at every point of the process. The waste that can be taken at the ERF will be primarily regulated pursuant to the permit for the facility. The precise list of wastes that can be accepted will be specified in the Permit by reference to EWC codes. There will also be a standard condition dealing with the waste hierarchy and not taking wastes that are capable of being recycled.</p> <p>Waste will be primarily regulated by the Environment Agency permit required to commission and operate the facility. We can give details of the stage of applying for the permit – it is a significant control. It will require a precise list of every waste code that can be accepted at the facility – European waste code references. Also controls on the permit itself that will deal with the waste hierarchy and compliance and ensuring that the Applicant is not taking waste capable of being recycled. These are outside of the DCO. The only other points are additional legal and policy requirements as well.</p> <p>Requirement 15 of the draft DCO (AS-006) – deals with the fuel type that may be used for the ERF which may only be processed RDF</p> <p>Other ERF DCOs – refer to waste hierarchy requirement</p> <p>NPS EN1 paragraph 4.10.3 states that in considering an application for development consent, the IPC should focus on whether the development itself is an acceptable use of the land, and on the impacts of that use, rather than the control of processes, emissions or discharges themselves. The IPC should work on the assumption that the relevant pollution control regime and other environmental regulatory regimes, including those on land drainage,</p>	<p>A copy of the wording of regulation 12 of the Waste Management Regulations 2011 is provided below:</p> <p>12.— Duty in relation to the waste hierarchy</p> <p>(1) An establishment or undertaking which imports, produces, collects, transports, recovers or disposes of waste, or which as a dealer or broker has control of waste must, on the transfer of waste, take all such measures available to it as are reasonable in the circumstances to apply the following waste hierarchy as a priority order—</p> <ul style="list-style-type: none"> (a) prevention; (b) preparing for re-use; (c) recycling; (d) other recovery (for example energy recovery); (e) disposal. <p>(2) But an establishment or undertaking may depart from the priority order in paragraph (1) so as to achieve the best overall environmental outcome where this is justified by life-cycle thinking on the overall impacts of the generation and management of the waste.</p>

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		<p>water abstraction and biodiversity, will be properly applied and enforced by the relevant regulator. It should act to complement but not seek to duplicate them.</p> <p>Many projects covered by this NPS will be subject to the Environmental Permitting (EP) regime, which also incorporates operational waste management requirements for certain activities. When a developer applies for an Environmental Permit, the relevant regulator (usually Environment Agency but sometimes the local authority) requires that the application demonstrates that processes are in place to meet all relevant EP requirements.</p>	<p>(3) When considering the overall impacts mentioned in paragraph (2), the following considerations must be taken into account—</p> <ul style="list-style-type: none"> (a) the general environmental protection principles of precaution and sustainability; (b) technical feasibility and economic viability; (c) protection of resources; (d) the overall environmental, human health, economic and social impacts.
37	<p>Josh Downen asked further about Regulation 12 – with a different interpretation as to how this operates.</p> <p>The Examiner clarified that there is a difference in interpretation and asked the Applicant to speak to UKWIN to set out what is and isn't agreed.</p>	<p>The Applicant will add to statement of common ground and cover it there.</p>	<p>The Applicant has no further comment</p>
38	<p>The Examiner asked the Applicant to summarise the last component of this section.</p>	<p>The Applicant explained that they don't need to say any more about how we may expect the composition to change over time. There have been substantial changes over the last 20 years and residual waste composition</p>	<p>The Applicant has no further comment.</p>

Ref	Questions / Issues Raised at ISH1	Summary of Applicant's Response at ISH1	Applicant's Written Response
		<p>hasn't changed much as a result. So, the Applicant can still expect estimated waste composition to be a reasonable estimate.</p> <p>In a competitive market, and as a merchant facility, the Applicant has the ability to negotiate fuel supply contracts to suit our needs in terms of source and composition, prioritising delivery by rail and water if that proves attractive. Expect to compete with others in the waste market and make the most of the advantages the facility will have.</p> <p>As a high efficiency facility with CCUS, and with the potential to receive residual waste by rail and water, the Project will prove attractive to customers seeking to reduce their overall Scope 3 carbon footprint to align with ESG objectives and for corporate reporting purposes. It represents a carbon negative solution for waste providers – that will make us attractive.</p> <p>As other EfW facilities reach the end of their lifetime, and as they become less attractive because of the are not suited to be retro-fitted with CCUS, waste throughput that they currently receive will become available to a preferred provider. The ERF will naturally attract fuels with lower travel times and lower financial and environmental costs, ie arising closer to the facility and more easily transported by rail or water.</p> <p>Waste composition naturally varies over time, since it depends on what businesses and householders consume and dispose. Nevertheless, it has been remarkably constant over the last three decades, particularly since the end of household ash discard; as more of one material is recycled, so is another, so that the overall balance remains similar.</p> <p>Policy measures that we can foresee that will affect waste composition are those that focus on specific materials, such as the Committee on Climate Change recommendations on the ban of biodegradable material from landfill, measures on the use and recycling of single use plastics, and the reduction of food waste and collection of kitchen waste.</p> <p>At the same time, there is a growing demand for bio-materials, including bio-polymers, especially for packaging, such that some materials in residual</p>	

Ref	Questions / Issues Raised at ISH1	Summary of Applicant's Response at ISH1	Applicant's Written Response
		<p>waste may have a different composition in the future. Because of their value, metals are likely to continue to be a focus of the objective of increasing recycling rates.</p> <p>The Environment Agency confirmed that there were no issues with what application said on this point.</p>	
Agenda Item 6: Use of river and rail deliver and export from the site			
39	<p>The Examiner asked the Applicant to provide an overview about how the River Trent and Flixborough Wharf will be used for the delivery of materials including waste for fuel to and from the site during construction and operation.</p> <p>The Examiner also asked the Applicant to provide an overview about how the Dragonby sidings, the reinstated Dragonby to Flixborough branch line and the new railhead at Flixborough Wharf will be used for the delivery of materials, including waste for fuel to and from the site during construction and operation</p>	<p>The Applicant explained that the application assumes a worst case of 100% delivery by road but includes options for rail and river.</p> <p>River:</p> <p>Operation of Port currently:</p> <ul style="list-style-type: none"> • 12hour vs 24 hour operation. Likely a historic planning permission for 24hour operation of the port but are able to operate within 6am-6pm hours – specifics of this consent have been requested from RMS Ports and will be provided once received. • Navigation Risk Assessment (NRA) confirms that there is the potential to operate 24 hours (have to come in and out on high tide – 2 in 2 out) <p>Max number of vessels during construction / operation:</p> <ul style="list-style-type: none"> • The Applicant confirmed that the NRA aligns with assessments set out in the Environmental Statement • ES assessed unloading operations for noise/emissions from shipping/ground contamination from previous activities at wharf/operations of ship movements disturbing birds (HRA)/effects on existing users of wharf in socio-economic chapter. 	The Applicant has no further comment

Ref	Questions / Issues Raised at ISH1	Summary of Applicant's Response at ISH1	Applicant's Written Response
		<p>NRA is preliminary risk assessment this discusses the need for full NRA to capture refinements on design within document etc after grant of the DCO, which is to be negotiated with ABP/RMS Ports.</p> <p>There are high level assumptions in the draft NRA so far, but the details will come from further commercial discussions.</p> <p>Confirmation that no physical changes are needed to the wharf. Confirmation that no changes are needed in terms of booking with ABP for number of vessels that can use the wharf.</p> <p>Port will continue to operate as currently used. Entry is via First Avenue rather than existing entrance is explained in the Transport Assessment.</p> <p>ABP to state capacity of Flixborough Wharf as it stands.</p> <p>ABP more than happy with what was set out by the Applicant – NRA is 99% complete. Some discrepancies but very minor and no cause for concern. Regarding the vessel movements there are no issues of allocation. ABP more than happy to support from that perspective and statement of common ground to be signed up to by the parties.</p>	
40	Simon Nicholson asked that each vessel carrying 1500-2000 tonnes is that during the construction period or post construction carrying waste as well? Is that same weight per boat of waste and also how many tonnes per vessel and what weight per container?	The Applicant will check numbers and reply separately.	In the first instance see the figures included in the NRA (APP- 073).

Ref	Questions / Issues Raised at ISH1	Summary of Applicant's Response at ISH1	Applicant's Written Response
41	The Examiner asked whether the navigation risk assessment is final and has been submitted and is suitable for ABP to make sure it is acceptable?	The Applicant also looking at this. We'd be comfortable to add something as a DCO requirement if it was found to be necessary and/or it can be dealt with in the SOCG with ABP.	The Applicant has no further comment.
42	The Examiner suggested that a SoCG is to be used to cover how the final risk assessment is agreed. The Examiner asked if there was any comment from ABP? But not 100% clear relationship to other parts, also how port currently operates and how their role fits with the plans for this site?	The Applicant agreed to deal with both aspects.	The Applicant has no further comment.
43	Simon Nicholson asked how is the proposed operation going to affect current operations at the port?	The Applicant explained that in terms of capacity, the Proposed Development will not interfere with current operations. The assessment concludes no adverse effects on operations at the port.	The Applicant has no further comment.
44	The Examiner queried that the Applicant made reference to current operations at the port for consent for 24 hours of operation. Is this planning consent or something else?	The Applicant has raised this with RMS Trent Ports. The Applicant suspects it is an aged consent which hasn't been easy to locate.	the Applicant has been unable to locate a copy of the planning permission but will continue to try to locate this with the support of the local planning authority.

Ref	Questions / Issues Raised at ISH1	Summary of Applicant's Response at ISH1	Applicant's Written Response
45	The Examiner asked to move on to next part of this topic in the agenda.	<p>The Applicant explained that a note is to be produced setting out what the approach to this is in the Application. The Application assumes 100% delivery by road but includes options for rail and water.</p> <p>DCO currently doesn't secure the delivery of the Railway in a specific timeframe. Indicative phasing plan (APP-073) in DCO – proposal is that we build railway as part of Phase 1, would be used for construction / operation / waste fuel.</p> <p>The Applicant has engaged with Network Rail, Vossloh Cogifer and one of the licenced rail freight operating companies, regarding the various rail opportunities presented by the Proposed Development. No physical works are required on Network Rail infrastructure to permit Works #3 or #4 to be undertaken, but various agreements will need to be in place with these external parties before trains can run to and from the proposed Development.</p> <p>The approach to the timing of the start of rail operations reflects the approach taken on other NSIPs with a rail component (in this case the two Strategic Rail Freight Interchanges at East Midlands Gateway and West Midlands Interchange), the timing of introducing the rail services is not “hard-wired” upfront as a dependency for the first phase of the programme, in part to avoid any external delays outside of the control of the Applicant then having knock-on impacts to the wider programme. This is the situation faced by another NSIP, the Northampton Gateway Strategic Rail Freight Interchange, where the promoter is currently seeking to amend the DCO to allow an initial phase of operations to commence on site, ahead of delivery of rail services into the site, due to external delays in securing access.</p>	The Applicant has no further comment.
46	Councillor Elaine Marper asked whether the rail will increase during working hours – minimal increase in rail traffic but now looking at 6 trains?	The Applicant confirmed that the proposals envisage up to 3 trains a day travelling into site, generating 6 train movements in total. The exact timing of the trains would be developed in detail much closer to the start of operations, once more is known about where trains would travel to and from the wider rail network.	The Applicant has no further comment

Ref	Questions / Issues Raised at ISH1	Summary of Applicant's Response at ISH1	Applicant's Written Response
47	Simon Nicholson asked the Applicant what kind of train will transport the waste as its going through populated areas and town of Dragonsby may be subject to waste wind-blown.	<p>The Applicant explained that waste will be in sealed containers on rail containers to protect the integrity of the railway. There will be doors at the end of the container which face inwards to each other as far as possible to further prevent doors opening during transit. Sealed containers are used to assure Network Rail's safe operation. Type of trains we can expect are the same trains used for Roxby and all the other existing rail-served ERF operations. Three sealed containers per wagon. Rail operations report (APP-045) paragraph 3.3 details type of locomotive, wagon and load.</p> <p>The worst case assessment set out in ES Chapter 3 (APP-051) paragraph 7.11 deals with the rail line and the proposed operation. The rail is capable of working 24/7 . Assumed references are included in the same document at paragraph 7.11.2, that there will be one movement approx. every 4 hours. Reference to noise and impact has been taken into account in ES Chapter 7 (APP-055), table 21 around service of one train, every 4 hours. 3 trains per day are likely to meet the full extent of the capacity.</p>	The Applicant has no further comment
47	Councillor Elaine Marper asked if there is rail at night and one movement every four hours, means two trains during the night.	<p>The assumption of 1 train every 4 hours on the Flixborough Branch Line is a worst-case scenario in noise terms. Works #3 proposed at Dragonby Sidings would provide a "layby" where trains can be held between the Site and the national rail network. This would allow more flexibility in the timing of trains to and from the Site itself. [Subject to further detailed assessment] It would be possible to create a schedule with the 3 trains travelling to and from the Site in window between 0700 and 2000, on the basis that each train would take around 4 hours to cycle from Dragonby Sidings to Site and back to Dragonby again. [although timings might have to be amended in the event of trains being delayed on their inbound or outward journeys].</p> <p>The Applicant further noted that trains stood at Dragonby Sidings or on site for any length of time would have their engines shut down, as much to save on the cost of fuel as to reduce noise.</p>	The Applicant has no further comment
48	Simon Nicholson asks if there is reference to the agreement where trains	The Applicant explained that freight trains move across the national rail network, including the existing branch line to Roxby Gullet, at all hours of the day and night (APP-051 Rail Operations Report page 19 section 4.1), the	The Applicant has no further comment

Ref	Questions / Issues Raised at ISH1	Summary of Applicant's Response at ISH1	Applicant's Written Response
	are allowed to move 24 hours to Roxby?	<p>latest timetable information for trains to and from Roxby show paths for trains as early as 04:20 and as late as 22:30.</p> <p>Whilst there may be restrictions for movement of trains within the site itself, trains can run on the national network at any time of day or night, the principle being challenged without success by the local authorities in Kent in advance of the opening of the Channel Tunnel in 1994. This is not to say that the Applicant would invoke that on the privately-owned Flixborough Branch Line, but the number and timing of trains to Roxby have varied in recent years.</p>	
49	Councillor Elaine Marper raised a particular interest in part of rail on site in Flixborough to Dragonby.	<p>See answer to item 48 above.</p> <p>The Applicant explained that, despite the ability to run any number of trains at any time of day or night, the objective for the Proposed Development is to minimise the environmental impact, so the Applicant is treating the movement of trains on Flixborough Branch Line differently as a result.</p>	The Applicant has no further comment
50	The Examiner asks if there is any likelihood of the line being used for construction because of the timings?	The Applicant explained that whilst Vossloh Cogifer has only made limited use of Dragonby Sidings to date, the sidings are operational, have signalling and are accessible by road, so there would be scope by agreement with Vossloh Cogifer for Dragonby Sidings to be used as a staging point for construction materials moved by rail, prior to the Flixborough Branch Line being reinstated.	The Applicant has no further comment
51	The Examiner asked who would sign off the construction and reinstatement of the railway to acceptable standard?	The Applicant explained that the railway works, including changes to Dragonby Sidings, reinstatement of the Flixborough Branch Line and the new railhead on site, would be of a scale requiring the involvement of the Office of Rail & Road (ORR), the Government's appointed regulatory body for all health and safety issues relating to rail transport. This is similar in nature to the works by Bristol Port Company and Network Rail, who in 2001 reinstated the 6-mile long Portbury branch line which had been closed to traffic for 15 years, linking to a new quayside rail terminal at Royal Portbury Docks. Unlike localised rail improvements which would typically be reviewed by Network Rail and/or a licenced rail Freight Operating Company (FOC) prior to the start of operations, the scale of the Applicant's proposals will necessitate the	The Applicant has no further comment but can pick up these points in the SOCG with NRIL.

Ref	Questions / Issues Raised at ISH1	Summary of Applicant's Response at ISH1	Applicant's Written Response
		involvement of ORR. In the event of a successful determination, the Applicant and its lead FOC partner will undertake detailed design of the rail works and associated method of works, and engage with ORR to seek the necessary agreements and approvals, including inspection of the rail works on completion, to enable rail services to be authorised to commence.	
52	The Examiner asked in terms of committing to the process you have identified, does the DCO commit you to that process?	The Applicant explained that for other DCOs like rail freight interchanges it would be highly unusual not to require notification of and prior approval of the ORR before the start of rail services. There is not a requirement that addresses this point re interacting with ORR, but in the event of a successful determination the ORR would be one of the key stakeholders for early engagement on the implementation of the Proposed Development.	<p>Post-determination, the areas where ORR would have an interest and/or locus would include:</p> <ul style="list-style-type: none"> - Network Licence (or exemption) under the Railways Act 1993. As the site and branch line was not in British Rail ownership at the time of privatisation in 1994, the Applicant should be exempt from the need to hold a Licence; - The provisions of Railways and Other Guided Transport Systems (Safety) Regulations 2006, the Applicant looking to appoint a Licenced rail Freight Operating Company to provide the Safety Management System (SMS) and Safety Certificate. - Safety review and approval of the rail-related Works #3 and #4 prior to the start of rail operations.
Agenda Item 7: The use of existing, new or modified pipelines to transport CO2 and H2			
53	<p>The Examiner asked the Applicant about the relationship to the proposed Zero Carbon Humber pipeline project.</p> <p>The Examiner also asked the Applicant about the relationship to the local</p>	<p>The Applicant gave an introduction as to what the pipeline Project is.</p> <p>Two separate projects. There is potential for a connection between the two facilities.</p> <p>Current assumption is for c55ktpa, which secures net carbon benefit and can act as a demonstrator for the technology and commercial proving of CCS on ERF. Option to export CO2 by river and by road to the quantities listed in the</p>	The Applicant has no further comment

Ref	Questions / Issues Raised at ISH1	Summary of Applicant's Response at ISH1	Applicant's Written Response
	gas distribution network for the transport of H2	<p>DCO – in application. Could expand if there was a market need and commercial drivers were in place</p> <p>There is space for a CO2 export pipeline within the new access road, directed to the south of the ERF. An extension to the network would be required to construct the pipelines to transport CO2 to the Zero Carbon Humber Pipeline. The routing involves crossing National Highways infrastructure if directed south parallel to the M181. If directed through Scunthorpe to the British Steel site, it would require routing of the pipeline along the A1077 using a similar to the northern DHN/PWN, but further south and east. Another option is to route alongside the reinstated railway.</p> <p>Sarah Clarke (BDB Pitmans on behalf of National Gird Carbon Limited (NGCL)) stated that there was nothing further to add on behalf of NGCL. Confirmed that NGCL are undertaking statutory consultation for their project and that the project does not currently include a connection between the pipeline and the Application.</p>	
54	The Examiner asked if NGC does not facilitate a connection, how does the application create a connection otherwise?	<p>Sarah Clarke explained that the NGCL project has been through a process of identifying a preferred route and are consulting on this. The Applicant confirmed that when the Application was submitted there wasn't a defined preferred route that had come forward, so the Applicant couldn't include that in the Application. The Applicant is anticipating how the Project could link in – that would require additional consent outwith both DCO applications currently.</p> <p>Sarah Clarke (BDB Pitmans) confirmed that in consultation documents NGCL has made clear the pipelines will include future capacity for connections.</p>	The Applicant has no further comment
55	The Examiner asked what weight we can attribute to a future connection and if there is anything in this Application that can provide an assurance as there is so much up in the air. This Application does not have a physical	The Applicant explained that it is still considering how this is best presented to this examination. Will also be making representations to the separate NGCL DCO pipeline project. Can provide additional info to the weight you might be able to attribute to the possibility of the connection – including proximity. It may be that during the next six months we can introduce further information.	The Applicant has no further comment

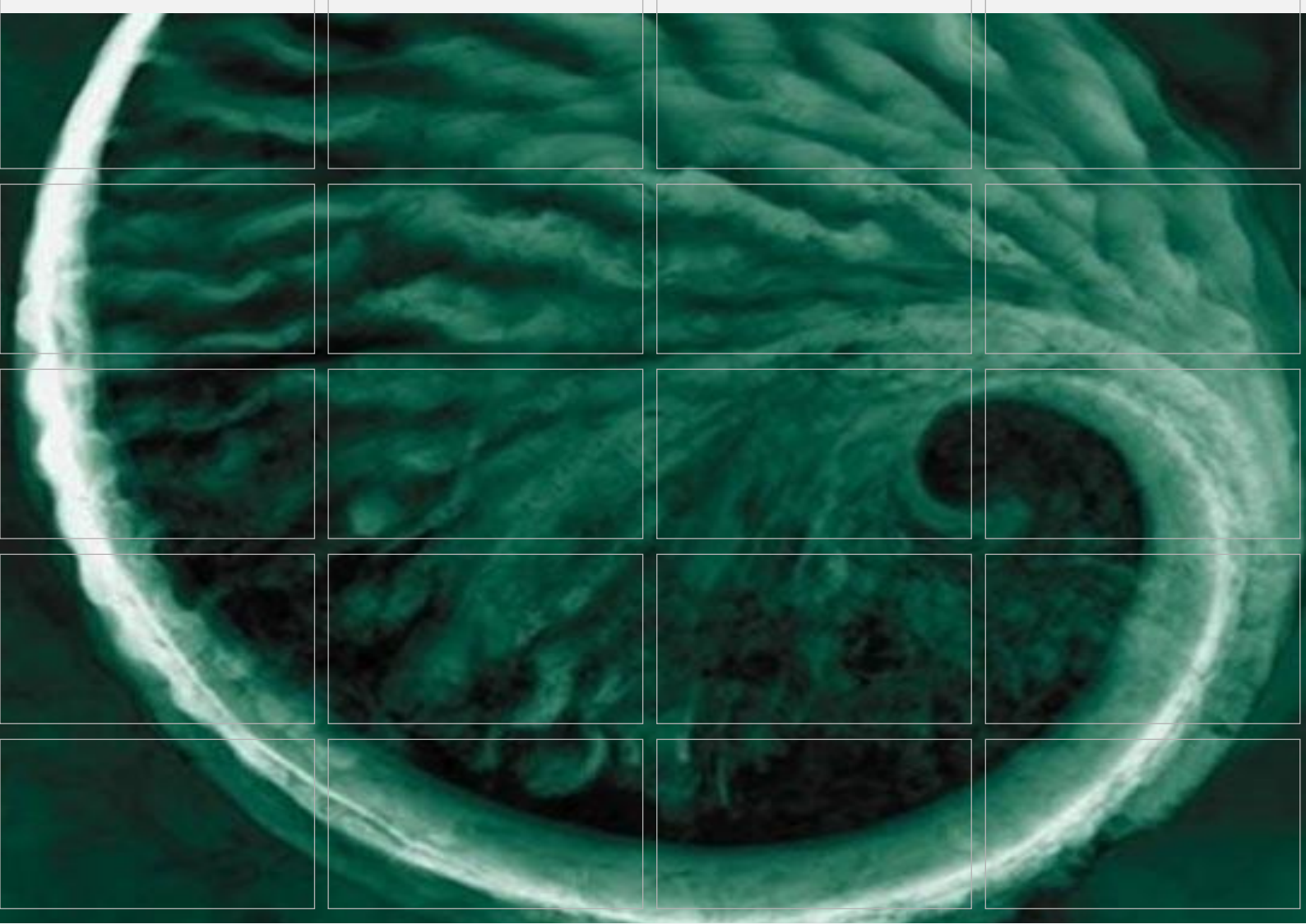
Ref	Questions / Issues Raised at ISH1	Summary of Applicant's Response at ISH1	Applicant's Written Response
	connection to the potential route that is yet to be certain. How would this possible opportunity be presented to SoS and what weight to it?		
56	The Examiner asked the Applicant to clarify the balance of the benefit of removing CO2 versus the loss of electricity generation.	The Applicant explained that the CCUS requires energy in two forms, as heat and as electrical power. The demands are fairly linear – set quantity of heat and power tonne of CO2 captured. Difficult to say without running the calculations, what the balance would be.	Please see Appendix 2.
57	Simon Nicholson stated that 55,000 tonnes per annum collected. What % was that is overall emissions from the site?	The Applicant explained that combusting a tonne of waste generates approx. a tonne of emissions	The Applicant has no further comment
58	The Examiner asked what is limiting that at the minute?	The Applicant explained that the drive for energy efficiency and commercial limitations – carbon capture is currently just a cost at present.	The Applicant has no further comment
59	The Examiner asked the Applicant to move on to point 2.	The Applicant explained that the scheme contains two AGIs, one in the north, and one in the south. Hydrogen cannot currently be exported into the gas grid and as such no powers have yet been sought to connect. The current limit is 0.1%, and there are material science issues. There are two AGIs within the scheme for the eventual purpose of exporting hydrogen to the gas grid, increasing the flexibility for the injection of hydrogen into the gas grid.	The Applicant has no further comment

Ref	Questions / Issues Raised at ISH1	Summary of Applicant's Response at ISH1	Applicant's Written Response
60	The Examiner asked how much weight was given to injecting hydrogen?	<p>The Applicant explained that there would be injections at a date when that is feasible. The 2021 UK Government provided a hydrogen strategy – eg project union. The aim is to inform National Grid on how they can convert pipelines, but the study is still ongoing.</p> <p>Intention is to connect to the local network for export of hydrogen, but only if hydrogen addition to the local gas grid is feasible and permitted.</p> <p>Not producing in sufficient volume to feed into the East Coast Cluster dedicated hydrogen network. Export would require routing alongside carbon export pipeline if brought forwards.</p> <p>Intention to connect to the grid in the first instance. It would follow the same route as the carbon capture pipeline if it was to be included</p>	The Applicant has no further comment
61	Simon Nicholson asked if hydrogen is not available until 2030s, what will happen to the hydrogen in the meantime and will the plan be viable?	The Applicant explained that there is another use for the hydrogen – hydrogen refuelling. Also potential for creating virtual pipelines where it is put into tankers and transported to users around the country	The Applicant has no further comment
Agenda Item 8: Review of issues and actions			
62	The Examiner agreed with the parties an agreed list of issues and actions	<p>The Applicant agreed with the Examiner the following:</p> <ol style="list-style-type: none"> 1. Review inconsistencies in the description of the development (within the Application Form, Draft DCO and Chapter 3). The ExA clarified that the description of generating station doesn't use same format of words in each and leads to a degree of confusion as to what it is the Applicant is proposing). 2. Respond to Mr Nicholson's concerns about landfill waste generated from ERF operations going on at this site 	<p>The Applicant's responses to the actions are as follows:</p> <ol style="list-style-type: none"> 1. We will address these points in our responses to ExA Qs 1.0.9 and 1.0.10 at Deadline 2. 2. Paragraph 8.3.1.4 of the waste chapter of ES (APP-063) refers to a very small amount of rejected incinerator bottom ash from the concrete block manufacturing facility which will go to landfill.

Ref	Questions / Issues Raised at ISH1	Summary of Applicant's Response at ISH1	Applicant's Written Response
		<ol style="list-style-type: none"> 3. Response to question raised by the ExA in respect of the weight attributed to hydrogen injected into gas system 4. Breakdown of waste composition 5. Consider with ABP how the final navigation risk assessment will be facilitated and will be signed off by ABP and consider whether that should be within a requirement or some other mechanism. 6. Look at whether planning consent for 24 hour operation of the Wharf can be found or if not what evidence the Applicant is relying upon for 24 hour operation 7. Relationship to operation of Flixborough Wharf Ltd and RMS Trent Ports to be explained and the current position with this. 8. Note on role of Office for Road and Rail in respect of rail connection whether that needs to be having any mechanism of being secured or delivered through permitting regime 9. Note on relationship between removal of CO2 and electricity generation and how those two work together/pull apart 10. Revised RDF Report to be submitted on Deadline 1. 	<ol style="list-style-type: none"> 3. Please see the Applicant's response at line 22 of this document. 4. See Appendix 1 of this document. 5. The Applicant is to address this in the SoCG with ABP. 6. The Applicant is liaising with North Lincolnshire Council to obtain a copy of the relevant permission. 7. The Applicant will respond to this at a later date. 8. Please see explanation provided at line 52 of this document. 9. Please see explanation at Appendix 2 of this document. 10. Please see the revised RDF Report submitted at Deadline 1.

APPENDIX 1

Waste Composition Assumptions Made to Enable Carbon Balance Assessment



North Lincolnshire Green Energy Park Climate Change Assessment

Waste Composition Assumptions Made to
Enable Carbon Balance Assessment

30 November 2022

Document details	
Document title	North Lincolnshire Green Energy Park Climate Change Assessment
Document subtitle	Waste Composition Assumptions Made to Enable Carbon Balance Assessment
Date	30 November 2022
Version	1.0
Author	Donald Reid, Simon Aumônier
Client Name	Solar 21

Document history

Version	Revision	Author	Reviewed by	ERM approval to issue		Comments
				Name	Date	
01	01	Donald Reid	Simon Aumônier	Simon Aumônier	30 November 2022	

Signature Page

3030 November 2022

North Lincolnshire Green Energy Park Climate Change Assessment

Waste Composition Assumptions Made to Enable Carbon Balance Assessment



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BACKGROUND

As part of the climate change assessment, ERM has conducted a carbon balance of the development, taking into account the emissions of carbon dioxide associated with the combustion of RDF and the avoided greenhouse gas emissions associated with, inter alia, the diversion of this residual waste from landfill, the supply of energy as electricity and heat and the avoidance of virgin material consumptions.

An assessment of this nature requires assumptions to be made concerning the composition of the RDF. This is because each material component has a different calorific value and the balance of components determines the overall calorific value of the fuel, how much of it is burned in the EfW plant and how much energy is recovered. The composition also determines the balance between 'fossil' carbon and 'biogenic' carbon in the fuel; where biogenic carbon is assumed by convention not to contribute to net greenhouse gas emissions because it is deemed to be in a closed cycle.

Overall Composition of Residual Waste RDF

The percentage breakdown of the RDF assumed to be received is shown in Table 1 below. This is as calculated and for the purposes of conducting an indicative carbon balance only. The presentation of the composition should not be taken to indicate either a level of precision or the predicted actual composition of the waste received.

Table 1 Overall assumed composition of RDF received

Waste Fraction	Percentage contribution of RDF composition
Paper and card	40.0%
Plastic film	11.6%
Dense plastic	11.4%
Textiles	5.2%
Absorbent hygiene products	4.0%
Wood	6.4%
Combustibles	12.5%
Non-combustibles	0.4%
Glass	0.2%
Organic	6.7%
Ferrous metal	0.5%
Non-ferrous metal	0.5%
Fine material <10mm	0.2%
Waste electrical and electronic equipment	0.1%
Specific hazardous household	0.1%

Sources of waste composition data

Waste composition varies from day to day from source to source and with season, whilst statistics on waste composition are far from exhaustive. Nonetheless, the range of composition to be expected is relatively well understood by waste management operators. Minor drift in composition can also be expected as a result of trends in consumption and in response to policy instruments. In the case of the fuel for a future development, it is clearly not possible to predict precisely what will be the composition

of its fuel, whilst at the same time it is necessary to make some forecast for the purposes of assessing its likely impacts and benefits.

ERM has drawn on reliable sources of waste composition data for the two major types of waste that are expected to contribute to the RDF throughput of the plant, residual household waste and residual commercial and industrial (C&I) waste. These are presented in Table 2 and Table 3, respectively.

Table 2 Composition of residual household waste

Waste Fraction	Percentage contribution of residual waste composition
Paper and card	21.1%
Plastic film	8.2%
Dense plastic	7.8%
Textiles	5.5%
Absorbent hygiene products	4.1%
Wood	2.3%
Combustibles	5.3%
Non-combustibles	3.8%
Glass	2.6%
Organic	32.0%
Ferrous metal	2.4%
Non-ferrous metal	1.1%
Fine material <10mm	2.2%
Waste electrical and electronic equipment	1.1%
Specific hazardous household	0.5%

Table 3 Composition of residual C&I waste

Waste Fraction	Percentage contribution of residual waste composition
Paper and card	25.7%
Plastic film	11.3%
Dense plastic	11.4%
Textiles	3.3%
Absorbent hygiene products	0.6%
Wood	5.1%
Combustibles	9.3%
Non-combustibles	5.0%
Glass	1.8%
Organic	17.9%
Ferrous metal	2.4%
Non-ferrous metal	1.2%
Fine material <10mm	3.2%
Waste electrical and electronic equipment	1.0%
Specific hazardous household	0.7%

Manipulation of waste composition data to predict RDF composition

ERM has assumed that the RDF received at the facility will comprise a mix of 50% residual household waste and 50% residual C&I waste, where the initial composition of these streams is as presented in Table 2 and Table 3 respectively.

We have assumed a degree of processing of these waste streams, and that a proportion of metals, inert materials, plastics and kitchen wastes will be removed as this processing occurs. These materials can be assumed to report to recycling and composting facilities and will contribute to the increase envisaged by policy in the rate of recycling. The benefits of this additional recycling and composting have not been taken into account in the assessment, since they are outside of the scope of the carbon balance of the facility itself.

Critical in this manipulation is the need to arrive at a calorific value for the indicative fuel composition that is consistent with the design of the facility. In practice, composition and calorific value will vary, and some balancing will be carried out at the facility itself, whilst its firing envelope allows it to use as a fuel RDF with quite a wide range of specification.

The adjustment made in allowing for the effect of processing of RDF, in order to end up at the design calorific value, is shown in Table 4.

Table 4 Manipulation of overall composition of RDF

Waste Fraction	Residual household and residual C&I waste on a 50:50 basis	Proportion carried over into RDF	Adjustment made to base composition, as calculated	Percentage contribution of RDF composition
Paper and card	23.4%	95%	22.230%	40.0%
Plastic film	9.8%	66%	6.435%	11.6%
Dense plastic	9.6%	66%	6.336%	11.4%
Textiles	4.4%	66%	2.904%	5.2%
Absorbent hygiene products	2.4%	95%	2.234%	4.0%
Wood	3.7%	95%	3.527%	6.4%
Combustibles	7.3%	95%	6.957%	12.5%
Non-combustibles	4.4%	5%	0.221%	0.4%
Glass	2.2%	5%	0.110%	0.2%
Organic	25.0%	15.0%	3.743%	6.7%
Ferrous metal	2.4%	12.5%	0.300%	0.5%
Non-ferrous metal	1.2%	26%	0.299%	0.5%
Fine material <10mm	2.7%	5%	0.135%	0.2%
Waste electrical and electronic equipment	1.1%	5%	0.053%	0.1%
Specific hazardous household	0.6%	5%	0.030%	0.1%

Characteristics of waste components

In order to complete the carbon balance assessment, it is necessary to understand the characteristics of each component of the predicted RDF, for example, its calorific value in order to estimate the overall calorific value of the fuel.

The key characteristics of each component as presented in Table 5, below.

The calorific value of this RDF composition is calculated to be 13.97 MJ/kg, close to the design value of 14.00 MJ/kg. This minor discrepancy is an artefact of the sources and manipulations of indicative sources of waste fuel. It will not lead to a significant error in the calculate carbon balance and impacts and benefits of the facility, as calculated. These are in any case only a strong indication of their scale, given the future fuel cannot be understood with absolute precision.

Table 5 Waste component characteristics

Waste Fraction	Percentage contribution of RDF composition	Moisture	Percentage biogenic carbon (wet weight)	Percentage biogenic carbon (wet weight)	Percentage fossil carbon (wet weight)	Biogenic carbon (%) MELMod DDOC	Net calorific value (MJ/kg wet weight)	Percentage ash content	Percentage ferrous metals content (%)
Paper and card	40.0%	24.08%	31.6%	31.6%	0.0%	15.7%	11.24	8.08%	
Plastic film	11.6%	28.47%	47.3%	0.0%	47.3%	0.0%	21.28	10.35%	
Dense plastic	11.4%	10.48%	54.4%	0.0%	54.4%	0.0%	24.86	8.46%	
Textiles	5.2%	19.12%	39.9%	19.9%	19.9%	6.7%	14.33	4.55%	
Absorbent hygiene products	4.0%	62.88%	18.5%	14.8%	3.7%	4.3%	5.53	2.44%	
Wood	6.4%	9.60%	43.8%	43.8%	0.0%	12.5%	16.84	1.80%	
Combustibles	12.5%	18.07%	38.4%	23.0%	15.4%	11.0%	14.06	12.86%	
Non-combustibles	0.4%	5.56%	7.0%	4.2%	2.8%	0.0%	2.57	82.14%	
Glass	0.2%	1.75%	0.3%	0.3%	0.0%	0.0%	1.42	96.85%	
Organic	6.7%	61.95%	14.1%	14.1%	0.0%	9.4%	3.59	9.31%	
Ferrous metal	0.5%	10.38%	0.0%	0.0%	0.0%	0.0%	0.00	100.00%	100.0%
Non-ferrous metal	0.5%	8.98%	0.0%	0.0%	0.0%	0.0%	0.00	100.00%	
Fine material <10mm	0.2%	40.99%	13.7%	0.0%	13.7%	6.3%	3.48	36.91%	
Waste electrical and electronic equipment	0.1%	10.11%	15.8%	0.0%	15.8%	0.0%	7.06	21.68%	
Specific hazardous household	0.1%	12.37%	7.7%	0.0%	7.7%	0.0%	7.54	34.19%	

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APPENDIX 2

NOTE ON CARBON CAPTURE AND ENERGY EFFICIENCY

The below chart shows an indicative relationship between the carbon capture capacity of the facility and the power output of the facility in respect of the Scheme.

Gross and net power decline at different rates. Gross power reduces due to steam extraction from the ERF steam turbine for the CCS system, which reduces the quantity of steam expanded to vacuum. Net power reduces due to lower gross power, compounded by electrical power demands of the CCS for mechanical components such as pumps, fans and compressors.

The trend assumes a constant Z factor, that is that the steam turbine extraction has been designed for each operational point on the graph rather than that the capture rate is increased gradually. Additionally, the demands of the CCS facility will depend on the technology provider chosen, and the detailed design of the capture plant. The values used to create this trend are the same used for the DCO application, which were provided by Aker Carbon Capture.

