



Planning Act 2008
Infrastructure Planning
(Applications Prescribed
Forms and Procedure)
Regulations 2009
APFP Reg. 5(2)(a)

Infrastructure
(Environmental Impact
Assessment)
Regulations 2017

North Lincolnshire Green Energy Park

Volume 6

Environmental Statement

6.2.15 Waste

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CONTENTS

1.	INTRODUCTION	1
2.	POLICY CONTEXT, LEGISLATION, GUIDANCE AND STANDARDS	2
2.2	Legislation.....	2
2.2.2	Waste Framework Directive 2008/98/EC	2
2.2.3	The Waste (England and Wales) Regulations 2011:	2
2.2.4	Hazardous Waste (England and Wales) Regulations 2005 (as amended)	3
2.2.5	Waste Management Duty of Care Regulations	3
2.2.6	National Planning Policy for Waste (2014).....	3
2.2.7	Waste Management Plan for England (2021)	3
2.3	Waste Standards, Guidance and Policy	4
2.3.1	National Planning Policy Framework 2021 and Planning Practice Guidance 2015 Onwards	4
2.3.2	Government Review of Waste Policy in England (2011).....	4
2.3.3	Waste Prevention Programme for England (2013)	4
2.3.4	Department for Environment, Food and Rural Affairs (DEFRA) Guidance on Applying the Waste Hierarchy (2011)	4
2.4	Local Area Plans.....	5
2.4.1	Local Planning Policy	5
2.4.2	Local Waste Management Plans	5
3.	CONSULTATION	7
4.	ASSESSMENT PARAMETERS	14
4.2	Project Details.....	14
4.3	Extent of the study	14
4.4	Cumulative Effects.....	15
4.5	Transboundary Impacts	15
4.6	Inter-Relationships with Other Topics	15
5.	ASSESSMENT METHODOLOGY AND SIGNIFICANCE CRITERIA	16
6.	BASELINE AND RECEPTORS	17
6.2	Local Waste Management Facilities	17
6.3	Regional Waste Management Facilities.....	21
6.4	Regional Waste Facility Availability and Capacity.....	25
7.	MITIGATION	26
7.2	Construction Waste Management.....	26
7.3	Operational Waste Management	27
7.4	General Good Practice Waste Management	29
8.	ASSESSMENT OF LIKELY EFFECTS.....	31
8.2	Construction Waste Arising.....	31
8.3	Operational Waste Composition and Quantities	32
9.	CONCLUSIONS	34
9.1	Construction Waste Management.....	34
9.2	Operational Waste Management	34
10.	REFERENCES	36

APPENDIX A FIGURES

List of Tables

Table 1: Scoping Consultation Responses	7
Table 2: Pre-application Consultation Responses	8
Table 3: Local Waste Management Facilities (sites within 10km)	18
Table 4: Landfills available in Lincolnshire (2019)	21
Table 5: Incinerators available in Lincolnshire (2019)	21
Table 6: Number of Permitted Waste Facilities in East Midlands (2019)	22
Table 7: Availability of incineration facilities that accepted waste in Lincolnshire in 2019	23
Table 8: Estimated Construction Waste Volumes.....	32

List of Figures

Figure 1: Waste Hierarchy (Source: DEFRA Guidance on applying the Waste Hierarchy)	5
Figure 2 ERF Process Flow Diagram	38
Figure 3 Concrete Block Manufacturing Facility Process Flow Diagram	39
Figure 4 Plastic Recycling Facility Process Flow Diagram	40

Acronyms and Abbreviations

Name	Description
ACT	Accelerated carbonation technology
CBMF	Concrete Block Manufacturing Facility
CEMP	Construction Environmental Management Plan
CoCP	Code of Construction Practice
DCO	Development Consent Order
DEFRA	Department for Environment Food and Rural Affairs
DoW CoP	Definition of Waste: Development Industry Code of Practice
EA	Environment Agency
EfW	Energy from Waste
ERF	Energy Recover Facility
ES	Environmental Statement
EU	European Union
EWC	European Waste Catalogue
FGTr	Flue Gas Treatment Residue
HDPE	High Density Polyethylene
IBA	Incinerator Bottom Ash
JMWMS	Joint Municipal Waste Management Strategy
MSW	Municipal Solid Waste
NLGEP	North Lincolnshire Green Energy Park
NPPF	National Planning Policy Framework
NPS	National Policy Statement
PEIR	Preliminary Environmental Information Report
PET	Polyethylene terephthalate

Name	Description
PP	Polypropylene
PRF	Plastic Recycling Facility
RDF	Refuse Derived Fuel
SMP	Soil Management Plan
WMP	Waste Management Plan
WMS	Waste Management Strategy

1. INTRODUCTION

- 1.1.1.1 This chapter provides the assessment of potential effects related to waste for the Project and forms part of the Environmental Statement (ES).
- 1.1.1.2 A full description of the Project is available in Chapter 3 Project Description and Alternatives (**Document Reference 6.2.3**).
- 1.1.1.3 This Chapter provides an assessment of waste generation during the construction and operational phases, considering the estimated volumes and the proposed options for recycling, recovery or disposal of waste in accordance with the applicable legislative framework, the waste hierarchy, and the capability of the existing local and regional waste management facilities.
- 1.1.1.4 The Chapter describes the assessment parameters and methodology, the baseline conditions of the site and receptors, embedded mitigation adopted for the purposes of the assessment, a summary of the likely significant effects arising and the measures required to mitigate any significant negative effects, and the likely residual effects thereafter.
- 1.1.1.5 This Chapter is intended to be read as part of the wider ES, with particular reference to inter-related sections, including Chapter 8 on Ground Conditions, Contaminated Land and Hydrogeology (**Document Reference 6.2.8**) and Chapter 13 Traffic and Transport (**Document Reference 6.2.13**).
- 1.1.1.6 The information presented in this Chapter has been supplemented based on feedback arising from consultation on the Preliminary Environmental Information Report (PEIR).

2. POLICY CONTEXT, LEGISLATION, GUIDANCE AND STANDARDS

2.1.1.1 The key legislation and policies relevant to the Project have been considered in Chapter 2: Policy and Legislative Context (**Document Reference 6.2.2**):

- The Infrastructure Planning (Environmental Impact Assessment) Regulation 2017 (as amended) (The Infrastructure EIA Regulations 2017);
- The Overarching Energy National Policy Statement (NPS) EN-1;
- National Policy Statement for for Renewable Energy Infrastructure (EN-3);
- National Policy Statement for Electricity Networks Infrastructure (EN-5);
- National Planning Policy Framework (NPPF) (2021);
- Planning Practice Guidance (PPG 2015 Onwards);
- Environmental Permitting Regulations 2016;
- Environmental Protection Act 1990; and
- Environment Act 2021

2.2 Legislation

2.2.1.1 A wide range of legislation, policies and guidance regulate the control and management of waste planning include the following:

2.2.2 *Waste Framework Directive 2008/98/EC*

2.2.2.1 The revised Waste Framework Directive clarifies the definition of 'waste' and other concepts such as 'recycling' and 'recovery'. It implements a revised 'Waste Hierarchy', expands the 'polluter pays' principle by emphasising producer responsibility and applies more stringent waste reduction and waste management targets for EU Member States. It also requires Member States to take measures to promote high quality recycling and to set up separate collections of paper, plastic, metal and glass.

2.2.2.2 Article 16 introduces the principles of self-sufficiency and proximity stating that the network shall enable waste to be disposed or recovered in one of the nearest appropriate installations, by means of the most appropriate methods and technologies, in order to ensure a high level of protection for the environment and public health. This is more generally known as the 'proximity principle'.

2.2.3 *The Waste (England and Wales) Regulations 2011:*

2.2.3.1 The Waste (England and Wales) Regulations 2011 transpose Directive 2008/98/EC on waste into national law in England and Wales. The regulations require the establishment of waste prevention programmes,

make related provisions in relation to waste prevention programmes and waste management plans, and impose duties in relation to the improved use of waste as a resource. The regulations require the Waste Hierarchy in Article 4 of the Waste Framework Directive to be applied in a priority order to require the separate collection of wastepaper, metal, plastic and glass, and prohibit mixing of those wastes once separately collected. It also makes provisions in relation to carriers of waste and brokers and dealers in waste.

2.2.4 Hazardous Waste (England and Wales) Regulations 2005 (as amended)

2.2.4.1 The Hazardous Waste (England and Wales) Regulations 2005 (as amended) set out the regime for the control and tracking of the movement of hazardous waste; waste that possesses hazardous properties that poses a threat to human health, or the environment is classified as hazardous waste. Wastes classified as hazardous are those listed in the List of Wastes included in the Hazardous Waste Directive 91/689/EC. Waste producers have a duty of care to investigate if they produce hazardous waste, segregate and store it appropriately, ensure that waste is managed correctly, and hazardous waste movement is done with the correct documentation and necessary records maintained.

2.2.5 Waste Management Duty of Care Regulations

2.2.5.1 Section 34 of the Environmental Protection Act 1990 imposes a duty of care as a legal requirement for those dealing with certain kinds of waste to take all reasonable steps to keep it safe.

2.2.6 National Planning Policy for Waste (2014)

2.2.6.1 The National Planning Policy for Waste (2014) contains the core principles of the 'plan led' approach, with a continued focus of moving waste up the Waste Hierarchy. The policy document details waste planning policies to enable a "more sustainable and efficient approach to resource use and management", for instance, the design and layout of new infrastructure should supplement sustainable waste management.

2.2.7 Waste Management Plan for England (2021)

2.2.7.1 The Department for Environment Food & Rural Affairs (DEFRA) published a National Waste Management Plan for England in January 2021. "The plan focuses on waste arisings and their management. It is a high-level, non-site-specific document. It provides an analysis of the current waste management situation in England and evaluates how the Plan will support implementation of the objectives and provisions of the Waste (England and Wales) Regulations 2011. It will be supplemented by a Waste Prevention Programme for England: Towards a Resource Efficient Economy which has yet to be published. This will set out plans for preventing products and materials from becoming waste, including by greater reuse, repair and

remanufacture supported by action to ensure better design to enable this to be done more easily.”

2.3 Waste Standards, Guidance and Policy

2.3.1 *National Planning Policy Framework 2021 and Planning Practice Guidance 2015 Onwards*

2.3.1.1 The National Planning Policy Framework (NPPF) does not have waste specific policies, but includes an environmental objective to use natural resources sensibly, and to minimise waste and pollution. It states that strategic policies should make provision for waste management and where practical, take account of substitute or secondary and recycled materials and minerals waste when supplying materials. The Planning Practice Guidance (PPG) for waste provides further information in support of the implementation of waste planning policy, such as the role of waste planning in meeting objectives, implementing the waste hierarchy and what types of waste planning authorities plan for e.g. municipal and household waste.

2.3.2 *Government Review of Waste Policy in England (2011)*

2.3.2.1 The Government Review of Waste Policy in England (2011) contains actions and commitments, which together set a clear direction towards a zero-waste economy.

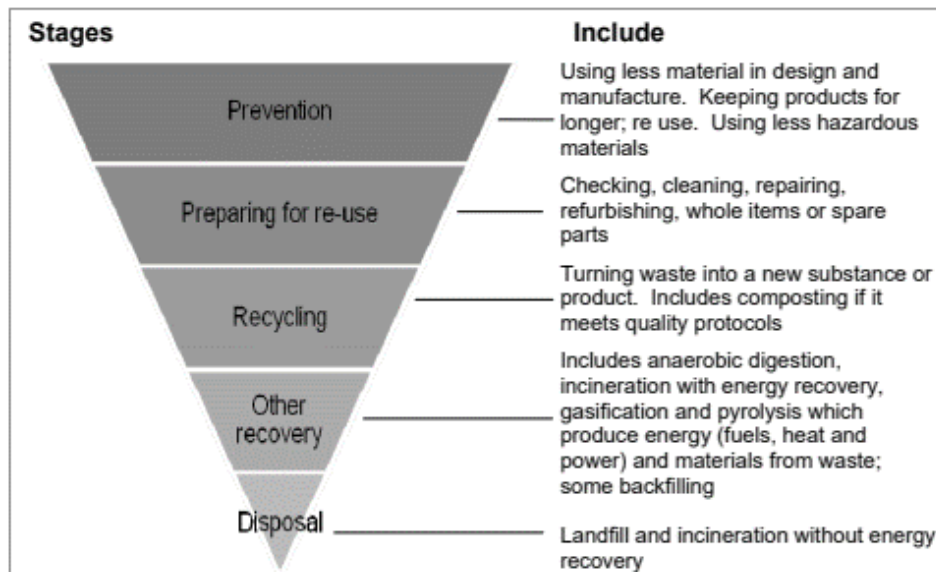
2.3.3 *Waste Prevention Programme for England (2013)*

2.3.3.1 The Waste Prevention Programme for England (2013) sets out key roles and actions that should be taken to move towards a more resource efficient economy. In addition, actions are described for the government to support this move, it also highlights actions businesses, the wider public sector, the civil society and consumers can take to benefit from preventing waste. The efficient use of resources, designing and manufacturing products for optimum life and repairing and reusing more products could be cost beneficial, as well as provide opportunities for economic growth, and enhancing the environment at the same time. The Environmental Agency are consulting on a new Waste Prevention Programme for England: Towards a Resource Efficient Economy.

2.3.4 *Department for Environment, Food and Rural Affairs (DEFRA) Guidance on Applying the Waste Hierarchy (2011)*

2.3.4.1 The Waste Hierarchy is set out at Article 4 of the revised Waste Framework (Directive 2008/98/EC). It ranks waste management options according to what is most favourable for the environment. The top priority is to prevent waste from being produced in the first instance. Where waste is produced, the lower level gives priority to preparing it for reuse, recycling, recovery, and disposal as a last resort.

Figure 1: Waste Hierarchy (Source: DEFRA Guidance on applying the Waste Hierarchy)



2.4 Local Area Plans

2.4.1 Local Planning Policy

2.4.1.1 The North Lincolnshire Local Plan was adopted in May 2003. Parts of this plan have since been replaced by the Local Development Framework. The Local Development Framework includes the Core Strategy, which sets out the long-term vision for North Lincolnshire and provides a plan for managing growth and development in the area up to 2026. It is part of the development plan for North Lincolnshire and is used to make decisions on planning applications. North Lincolnshire Council is currently preparing a new Local Plan for North Lincolnshire, and on 15 October 2021 began public consultation on the Publication Draft which is open for comments until 26 November 2021. Once adopted, it will eventually replace both the 2003 Local Plan and the Local Development Framework plans. Appendix B of Chapter 2 Policy and Legislative Context (**Document Reference 6.2.2**) lists the policies considered relevant to the Project.

2.4.2 Local Waste Management Plans

2.4.2.1 North Lincolnshire Council published a Waste Management Strategy in May 2012. The document sets out a description of the systems that are in place, how they are performing, and the initiatives needed to adapt to the future. The Plan states that waste needs to be managed in a more sustainable way and that a sustainable approach is required to meet new legislation, which gives a much higher priority to waste prevention, recycling and treating waste to recover value from it. The waste strategy adheres to the Waste Hierarchy aims and ensures delivery of the strategy has limited risks.

- 2.4.2.2 The implementation of the Waste Management Strategy intends to enable the Council to meet statutory targets related to waste, reduce the amount of biodegradable waste landfilled and prepare for zero waste.
- 2.4.2.3 The Council promotes sustainable waste management by:
- Requiring Site Waste Management Plans for future major developments to minimise waste;
 - Requiring the integration of facilities for waste minimisation, re-use, recycling and composting, in association with the planning, construction and occupation of new development; 303842/EVT/EES/02/A 10th May 2012 Municipal Waste Management Strategy 19 North Lincolnshire Council;
 - Providing guidance on minimising potential social, environmental and economic impacts that are likely to arise in the development of waste infrastructure; and
 - Establishing a planning policy framework that identifies suitable locations for waste management.
- 2.4.2.4 The document also discusses landfill allowances and states that the Council will not be able to meet longer-term landfill allowance targets until a suitable treatment facility has been installed to treat the remaining waste generated above the allowance.
- 2.4.2.5 The Waste Management Strategy for Lincolnshire was adopted in January 2019 as a regional strategy by Lincolnshire County Council and provides a Joint Municipal Waste Management Strategy (JMWMS) for the region. It outlines the current situation surrounding waste management and forecasts a growth scenario for an increase of 15% in waste per head growth by 2031 (approximately 50,000 tonnes of extra household waste).
- 2.4.2.6 It states that there is a limited future availability of landfill and outlines the fact that the Hykeham EfW Plant does not have the capacity to process the forecasted quantities of residual waste.
- 2.4.2.7 A key objective of the Strategy is to assess what further waste processing/disposal capacity is required and, as necessary, seek to secure appropriate capacity.

3. CONSULTATION

3.1.1.1 Table 1 and Table 2 below respectively present excerpts from the scoping opinion received from the Planning Inspectorate and consultation responses on the PEIR specific to the Waste assessment. The tables describe how each response has been addressed, and, as appropriate where more information can be found in the ES.

Table 1: Scoping Consultation Responses

PINS ID	Issue	Inspectorate's comments	Response / Action	Reference within this document
4.12.6	Proposed to be scoped out: Waste	The Inspectorate does not agree that an assessment of construction and operational waste can be scoped out of the ES. The ES should assess any impacts from waste produced from the construction and operation of the Proposed Development which are likely to result in significant effects.	Construction and operational waste impacts are addressed in this Chapter 15.	N/A
N/A	Waste hierarchy compliance and assessment of waste effects	Public Health England response: The applicant should demonstrate compliance with the waste hierarchy (e.g. with respect to re-use, recycling or recovery and disposal). For wastes arising from the development the ES should assess: <ul style="list-style-type: none"> ■ the implications and wider environmental and public health impacts of different waste disposal options ■ disposal route(s) and transport method(s) and how potential impacts on public health will be mitigated 	Construction and operational waste impacts, including compliance with the waste hierarchy, are addressed in this Chapter 15 and in RDF Supply Assessment (Document Reference: 5.2).	Sections 7 and 8

3.1.1.2 Table 2 presents relevant comments made during Section 42 and Section 47 consultation specific to waste. The table describes how each response has been addressed by the Project. Responses have been included when they are directly relevant to the Infrastructure Planning (Environmental Impact Assessment) Regulation 2017 (the Infrastructure EIA

Regulations 2017), have required a technical clarification and / or further impact assessment. The full set of responses is contained in the Consultation Report (**Document Reference: 7.1 Appendix I-1**).

3.1.1.3 The consultee types for the purposes of statutory consultation under the Planning Act 2008 are as follows:

- s42(a) is with prescribed consultees;
- s42(b) is with local authorities;
- s44 is with consultees with an interest in land; and
- s47 is with the local community.

Table 2: Pre-application Consultation Responses

Consultee Type	Consultee	Comments	Response / Action	Reference within this document
S24(a)	Burton upon Stather Parish Council	What will happen to heavy metals and carcinogenic chemicals that are removed from the flue ash and fly ash as you have stated that no waste will be going off site?	<p>Heavy metals are controlled in the ERF by dosing activated carbon into the flue gas. The heavy metals absorb into the activated carbon. The activated carbon then collects on the bag filter with reacted material and unreacted reagents.</p> <p>This collection of material is called flue gas treatment residue (FGTr) and is normally transferred for off-site treatment as a hazardous waste. It is classified as hazardous due to its high pH.</p> <p>The facility includes a flue gas treatment process, which reprocesses this residue using an accelerated carbonation technology (ACT). In the ACT process, FGTr is mixed with cement, quarry fines and water to form a slurry. The slurry is then cured in a damp environment, which has a strong concentration of carbon dioxide. The slurry cures into a lightweight aggregate, with hazardous content encapsulated within the aggregate. The ACT process has been used at other facilities in the UK to FGTr into a lightweight</p>	N / A

Consultee Type	Consultee	Comments	Response / Action	Reference within this document
			aggregate.	
S24(a)	Burton upon Stather Parish Council	It has not been clarified as to how the plastic that will be recycled will be transported to the site.	The PRF will take source-segregated waste plastics (PET, HDPE, and PP) from RDF which will be delivered to the ERF by a combination of rail, road and river transport, the details of which are presented in Chapter 15: Waste of the Environmental Statement (Document Reference 6.2.15).	N / A
S47	Local Community	Will local landfill rubbish be recycled at this site or as usual will the council impose restrictions which in turn encourages fly tipping.	There is a regional need for a waste treatment facility to intercept the volume of RDF currently being exported and the volume of household waste currently being landfilled in the East Midlands region. The 'proximity principle' will be applied, whereby waste will be sourced as close to the point of generation as reasonably practicable. However, it is not within the scope of the DCO for us to comment on restrictions that the Council may or may not impose.	6.4.1.4 7.2.1.11 8.2.1.5 8.3.1.12
S47	Local Community	I hope the council use and develop this energy park instead of returning to old habits in a few years. They really need to invest a lot more in recycling instead of landfill or refusing rubbish which leads to fly tipping.	The Applicant and proposed operator of the Project is Solar 21 – a company which sources, develops, and manages green energy projects. The Project combines technologies to capture, store and use by-products from the energy recovery process and is considered a greener alternative to landfill.	N / A
S47	Local Community	As part of the North Lincolnshire green initiative will more rubbish bins be provided in and around the towns/villages to help prevent littering.	The Project will provide an ERF for the wider region, as well as combined technologies to capture, store and use by-products from the energy recovery process. The local authority is responsible for the provision of waste receptacles.	N / A
S47	Local Community	Roxby have been complaining about manchester waste forever and NLC have failed the local area.	The 'proximity principle' will be applied on this Project, whereby waste will be sourced as close to the point of generation as reasonably practicable.	7.2.1.11 8.2.1.5 8.3.1.12

Consultee Type	Consultee	Comments	Response / Action	Reference within this document
S47	Local Community	Will NLGEP replace the Roxby facility? is there any waste water facility?	The Project is not intended as a replacement for the Roxby facility. Its key purpose is to divert waste away from landfill.	N / A
S47	Local Community	will local council waste be a feed? The crosby warren site looks dodgy.	Refuse Derived Fuel (RDF) will be sourced from UK only and there is a regional need for a waste treatment facility to intercept the volume of RDF currently being exported and the volume of household waste currently being landfilled in the East Midlands region. Therefore, the 'proximity principle' will be applied, whereby waste will be sourced as close to the point of generation as reasonably practicable. We have assessed waste in Chapter 15 Waste of the Environmental Statement (Document Reference 6.2.15).	6.4.1.4 7.2.1.11 8.2.1.5 8.3.1.12
S47	Local Community	Is the refuse coming from abroad.	The 'proximity principle' will be applied, whereby waste will be sourced as close to the point of generation as reasonably practicable. Refuse Derived Fuel will be sourced from UK only. We have assessed waste in Chapter 15 Waste of the Environmental Statement (Document Reference 6.2.15).	6.4.1.4 7.2.1.11 8.2.1.5 8.3.1.12
S47	Local Community	Firstly, residents have raised concerns that the proposals are seemingly for the construction of an incinerator that would bring waste from other parts of the country.	We have assessed waste in Chapter 15 Waste of the Environmental Statement (Document Reference 6.2.15). There is a regional need for a waste treatment facility to intercept the volume of RDF currently being exported and the volume of household waste currently being landfilled in the East Midlands region. The 'proximity principle' will be applied, whereby waste will be sourced as close to the point of generation as reasonably practicable.	6.4.1.4 7.2.1.11 8.2.1.5 8.3.1.12
S47	Local Community	This is an incinerator for household waste and not the green energy project we were initially led to believe it was. With that in mind, and given the weight of residents' concerns, I	We have assessed waste in Chapter 15 Waste of the Environmental Statement (Document Reference 6.2.15). There is a regional need for a waste treatment facility to intercept the volume of refuse derived fuel	6.4.1.4

Consultee Type	Consultee	Comments	Response / Action	Reference within this document
		would not support the proposals.	(RDF) currently being exported and the volume of household waste currently being landfilled in the East Midlands region.	
S47	Local Community	The importation of waste, whether it be from within the UK or from further afield is not something that residents in this area should have to accept, given that for many years local residents have suffered the impacts of odour, flies, and transport of waste into two major landfill sites. The belief is that North Lincolnshire, in particular this area, has already done enough with regard to accepting waste from other areas. This goes against the waste proximity principal whereby the Waste Regulations highlight that transportation of waste can incur significant environmental and nuisance impacts as well as unwanted additional costs. Therefore, such waste processing facilities should be as near to the point of production as possible. This is not the case here where waste will be taken in from far and wide.	The 'proximity principle' will be applied, whereby waste will be sourced as close to the point of generation as reasonably practicable. We have assessed waste in Chapter 15 Waste of the Environmental Statement (Document Reference 6.2.15) .	6.4.1.4 7.2.1.11 8.2.1.5 8.3.1.12
S47	Local Community	The proposed incineration site is very unacceptable and should be removed. Wheelie bin waste has about 12% Plastics which should never be burnt. We should encourage more recycling since the true reduction in CO2 is minimal from incineration but the long-term health and environmental issues are considerable. plants emit almost as much carbon dioxide per kilowatt hour of electricity they export to the grid, as a coal-fired power plant. Hows we get better at recycling the balance will tip towards landfill. We must protect our environment and and the	The Project combines technologies to capture, store and use by-products from the energy recovery process; for example, the plan incorporates a polymer production facility (PPF) that will take source-segregated waste plastics (PET, HDPE, and PP) from RDF and treat it to produce pellets or flakes of 'raw' plastics, free of contaminants that can be used to manufacture new plastic products without the use of fossil fuels. Given that there is a regional need for a waste treatment facility to intercept the volume of RDF currently being exported, as well as considering the volume of household waste currently being landfilled in the East Midlands region, the effects on local capacity	6.4.1.4 7.3 9.2

Consultee Type	Consultee	Comments	Response / Action	Reference within this document
		health of our local residents and stop the incineration proposal the companies fiddle the figures to make it look Green when the reality is there is little difference. Other projects are good but stop the incinerator.	can be considered to be positive.	
S47	Local Community	Do not want waste incinerator. Goes against the plans. Goes against the environment.	Given that there is a regional need for a waste treatment facility to intercept the volume of RDF currently being exported, as well as considering the volume of household waste currently being landfilled in the East Midlands region, the effects on local capacity can be considered to be positive.	6.4.1.4 9.2
S47	Local Community	Government policy regarding these incinerator sites needs close scrutiny as to whether they should be built at all never mind on this scale.	There is a regional need for a waste treatment facility to intercept the volume of RDF currently being exported and the volume of household waste currently being landfilled in the East Midlands region. The effects of the Project on local capacity can therefore be considered to be positive.	6.4.1.4 9.2
S47	Local Community	I would be interested to hear how Solar 21 can use its reputation as a leader in greener energy to shape government policy on waste. Wouldn't it be wonderful to have less waste to dispose of in the first place? Also, there is a lot of environmental destruction linked to the production of plastics and other waste products in the first place. Please help with this in any way you can.	In accordance with the waste hierarchy, we will always seek to reduce, re-use or recycle waste first - that is why our proposals include a Plastic Recycling Facility. We will also educate people about living sustainably at the Visitor Centre.	Chapter 2 Project Description and Chapter 15 Waste, 7.3
S47	Local Community	How is this a green energy park when you are disposing of waste? Where is all of the waste coming from? You have stated that it will save from going to landfill, you are going to incinerate material on the plant. It is not a green plant, a refuse collection plant and disposal more like.	The Project combines technologies to capture, store and use by-products from the energy recovery process. In accordance with the waste hierarchy, we will always seek to reduce, re-use or recycle waste first - that is why our proposals include a Plastic Recycling Facility. We have assessed impacts on climate change - how 'green' the project is - in Chapter 6: Climate of the Environmental Statement (Document Reference	Chapter 6 Climate Chapter 15 Waste: 7.2.1.11 8.2.1.5 8.3.1.12

Consultee Type	Consultee	Comments	Response / Action	Reference within this document
			<p>6.2.6). Compared to the alternative of managing waste through landfill, we expect operation of The Project to result in an overall reduction in the release of the greenhouse gases which contribute to climate change. Indeed, there is a regional need for a waste treatment facility to intercept the volume of RDF currently being exported and the volume of household waste currently being landfilled in the East Midlands region. The 'proximity principle' will be applied, whereby waste will be sourced as close to the point of generation as reasonably practical.</p>	

4. ASSESSMENT PARAMETERS

4.1.1.1 The following section defines the scope and boundaries of the waste assessment.

4.2 Project Details

4.2.1.1 The Energy Park Land is located on land within and to the south of Flixborough Industrial Estate, to the west of Scunthorpe, North Lincolnshire. This element of the Project encompasses an area within and adjacent to Flixborough Wharf (RMS Trent Ports) on the east bank of the River Trent.

4.2.1.2 The Flixborough Wharf and Flixborough Industrial Estate together form an industrial complex that has supported a range of businesses and industrial activities since the early 1900s. Existing infrastructure includes roads, a rail spur, a 155 m long wharf, weigh bridge, cranes, warehousing and stock sheds, workshops and portable offices.

4.2.1.3 Land adjacent to the Flixborough Industrial Estate included within the Energy Park Land, is currently a mix of both brownfield land and areas used for arable agriculture, comprising a number of fields separated by hedgerows and well-established drainage ditches, which are maintained by the internal drainage board.

4.2.1.4 There are a number of buildings and structures that require demolition prior to the commencement of the Energy Recovery Facility (ERF) as detailed in Chapter 3 Project Description and Alternatives (**Document Reference 6.2.3**).

4.2.1.5 Site clearance and excavations will be required for the Project. Generally, based on site history and Ground Investigation reports, most of the site is expected to be non-contaminated.

4.2.1.6 There are some areas of land that have the potential for being contaminated, including around the port area which is known to have past industrial use, and land adjacent to the Flixborough Industrial Estate, although borehole analysis undertaken across the site has not revealed significant contamination.

4.2.1.7 Given the industrial legacy, there may be contaminated land requiring disposal and treatment arising from the excavations. Chapter 8 on Ground Conditions, Contaminated Land and Hydrogeology (**Document Reference 6.2.8**) addresses the potential of contaminated land.

4.3 Extent of the study

4.3.1.1 This Chapter assesses waste anticipated to be produced during the construction and operational phases of the Project.

- 4.3.1.2 Other topic chapters have covered the impacts of waste generated on site relevant to the receptors of the specific topic, including Chapter 8 on Ground Conditions, Contaminated Land and Hydrogeology (**Document Reference 6.2.8**), which addresses the impact of contaminated materials excavated during construction and Chapter 13 Traffic and Transport (**Document Reference 6.2.13**), which addresses effects relating to the vehicles arriving and departing from the site, which would include those transporting waste away from the site during the construction phase.
- 4.3.1.3 The study also considers effects on the local and regional waste management and treatment infrastructure where disposal and treatment for waste arising from the site will be managed.

4.4 Cumulative Effects

- 4.4.1.1 Cumulative effects are considered as an inherent part of the assessment. The potential effects on the capacity of local waste management infrastructure take into account the ongoing demands on such infrastructure from other projects and activities.

4.5 Transboundary Impacts

- 4.5.1.1 There will be no transboundary impacts as no construction or operational waste will be exported out of the UK for disposal. All waste arising will be managed at UK facilities. Refuse Derived Fuel (RDF) feedstock will be sourced from treatment and aggregation sites within the UK.

4.6 Inter-Relationships with Other Topics

- 4.6.1.1 Regarding the inter-relationships with other topics, the impacts of waste generated onsite have been also addressed in other relevant chapters, including Chapter 8 Ground Conditions, Contaminated Land and Hydrogeology (**Document Reference 6.2.8**) and Chapter 13 Traffic and Transport (**Document Reference 6.2.13**).

5. ASSESSMENT METHODOLOGY AND SIGNIFICANCE CRITERIA

- 5.1.1.1 There are no specific guidelines available for waste assessment. This assessment was carried out by taking into consideration relevant legislation, policy and guidance related to waste management and application of the Waste Hierarchy, in order to derive the significance of likely effects.
- 5.1.1.2 The assessment of waste generation effects undertaken in this chapter is based on the following assumptions:
- Construction wastes quantities and excavations are unconfirmed, but reasonable worst-case assumptions have been made as outlined in Section 8 of this Chapter.
 - The specific breakdown for the construction phase of waste volumes arising by waste type, the nature of the materials, (e.g. hazardous, non-hazardous or inert material) and treatment requirements (i.e. whether it can be disposed of onsite or removed for treatment off-site) are yet to be determined, as is normal at this stage in a project's development. Estimated percentages have been made based on a combination of the Project and knowledge of similar projects.
 - Operational waste volumes have been estimated based on the expected capacity of the Project, and the likely volumes of waste that can be recovered and recycled. Where possible, waste products will be treated and managed on site. This includes the cleaning and maturation of bottom ash where the metals will be recycled and the cleaned bottom ash used in the production of concrete products. The fly ash and flue gas treatment residues will be mixed with carbon dioxide (CO₂) captured from the flue gas to produce a cementitious product on site. The waste resulting from the plastic recycling process will be sent to the ERF for energy recovery.
- 5.1.1.3 The estimated waste volumes arising from the construction and operation phases have been considered, to determine the likely significant residual effects. The significance of effects is considered in two ways:
- The extent to which the waste hierarchy can be applied to address the different wastes arising from the Project, such that a large proportion of a waste type needing disposal would be considered to be a likely significant effect; and
 - The extent to which existing facilities are able to accommodate different waste types arising from the Project, such that the capacity of existing facilities being compromised would be considered as a likely significant effect.
- 5.1.1.4 Baseline data used for the purposes of the assessment was gathered using publicly available data sources, which have been referenced throughout.

6. BASELINE AND RECEPTORS

- 6.1.1.1 The study area is within the Flixborough Wharf and Flixborough Industrial Estate, which historically has supported a range of businesses and industrial activities.
- 6.1.1.2 There is the potential that due to historic usage, land and soil may be contaminated in places. Reasonable assumptions have been applied as to the percentages of excavated soil that could be contaminated.
- 6.1.1.3 The volume of construction waste and excavations is unconfirmed, but reasonable assumptions have been made, along with estimated percentages of potentially contaminated material that may be hazardous.
- 6.1.1.4 There are a number of buildings and structures that require demolition prior to the commencement of the Project. These buildings and structures will likely be demolished at the beginning of the first phase of construction when construction compounds are being established.
- 6.1.1.5 The construction programme estimates that construction will be completed in six phases and several sub-phases across six years.
- 6.1.1.6 The volume of operational waste to be accepted into the ERF and waste arising as a result of the various processes have been estimated for design purposes of this assessment.
- 6.1.1.7 Waste management facilities available locally and regionally were considered for the assessment. This included the number of facilities available and their capacity, both from the perspective of accepting waste arising from the Project and the impact the Project could have on easing capacity issues.

6.2 Local Waste Management Facilities

- 6.2.1.1 Local waste management facilities were identified from the Environment Agency Public Register (EA, 2021). The search radius was limited to 10 km of the Project (based on postcode DN15 8SE). This was in order to assess the local waste capacity, both from the availability of local waste management facilities to accept similar types of waste that the Project may accept, and waste arising from the construction phase of the site's development.
- 6.2.1.2 There are 35 registered waste management facilities recorded within 10 km the Project. This includes facilities likely to accept limited volumes of waste e.g. recycling centres taking recovered ferrous and non-ferrous metals. Table 3 lists all 35 facilities in the vicinity.

Table 3: Local Waste Management Facilities (sites within 10km)

Name	Licence No.	Address	Distance (km)	Facility Type
Michal Kucharski	WE2736AB/A001	Unit 6, Second Avenue, Flixborough, DN15 8SD	0.43	S1517
M R F Glass Recycling Limited	AB3004MY/A001	Groveport, Grove Wharf, Gunness, Scunthorpe, N Lincolnshire, DN15 8AU	2.15	A16
Groveport Logistics Limited	AP3595LY/V003	Groveport, Gunness, Scunthorpe, N Lincolnshire, DN15 8UA	2.33	A11
Northern Waste Group Limited	CB3202CZ/V003	Stirling Business Park, Park Farm Road, Foxhills Ind Estate, Scunthorpe, N. Lincolnshire, DN15 8QP	2.33	A11
Suez U K Environment Ltd	YP3195NE/V005	Dragonby Landfill Site A, Normanby Road, Scunthorpe, N Lincolnshire, DN15 8QZ	2.77	A01
A 2 Z Motorparts Limited	HB3107HG/A001	Unit 2, 4, Hebden Road, Scunthorpe, N Lincolnshire, DN15 8DT	2.85	S1517
Overhall Contractors Limited	DB3703MC/A001	Normanby Road, Scunthorpe, N Lincolnshire, DN15 8QZ	3.01	S0811
North Lincolnshire Council	RP3094NM/A001	Land/ Premises At, Normanby Road, Scunthorpe, N Lincolnshire, DN15 8QZ	3.02	A02
Aaraav Metal Recycling Limited	FB3804KV/T001	Pps Metal Recycling, Wybeck Road, Mannaberg Way, Scunthorpe, N Lincolnshire, DN15 8XF	3.64	A19
Carmax Auto LTD	WE6831AA/A001	Byfield Works, Wybeck Road, Scunthorpe, DN15 8QR	3.74	S1518
Ellgia Limited	WP3397FZ/V006	Pit Bottom, Winterton Road, Scunthorpe, N Lincolnshire, DN15 0DH	4.56	A11
Ellgia Limited	LP3990CY/V004	Pit Bottom, Winterton Road, Scunthorpe, N Lincolnshire, DN15 0DH	4.61	A09
Ellgia Limited	YP3090CV/V002	Pit Bottom, Off Winterton Road, Scunthorpe, N Lincolnshire, DN15 0DH	4.64	A16
Biffa Waste Services Limited	HB3609UH/T001	Land/ Premises At, Roxby Sidings, Roxby, Scunthorpe, N Lincolnshire, DN15 0DB	5.01	A11
Koppers Landfill Limited	KB3000CZ/T001	Dawes Lane, Scunthorpe, N Lincolnshire, DN15 6UR	5.03	A07
M A Global Parts Ltd	JB3407MD/T001	10, High Street East, Scunthorpe, N Lincolnshire, DN15 6UH	5.09	A20
British Steel Limited	DB3103KJ/V002	Crosby Warren Landfill, P O Box 1, Brigg Road, Scunthorpe, N Lincolnshire, DN16 1BP	5.33	A07

Name	Licence No.	Address	Distance (km)	Facility Type
Suez Recycling And Recovery U K Ltd	CP3390CP/V004	Crosby Warren, Off Dawes Lane, Scunthorpe, N Lincolnshire, DN15 6UW	5.56	A11
North Lincolnshire Council	DP3097FC/V003	Cottage Beck Transfer Station, Cottage Beck Road, Scunthorpe, N Lincolnshire, DN16 1TS	5.81	A09
North Lincolnshire Borough Council	KB3737RF/T001	Cottage Beck Civic Amenity Site, Cottage Beck Road, Scunthorpe, N Lincolnshire, DN16 1TS	5.84	A13
Wingate Michael	BB3101XU/A001	The Old Iron Stone Mines, Thealby Lane, Thealby, Scunthorpe, N Lincolnshire, DN15 9AG	5.84	S0803
Lincs Motorcycle Breakers Ltd.	WE2853AA/A001	20, Northampton Road, Scunthorpe, DN16 1UJ	5.94	S1517
L A S Metals Limited	MB3033DB/V003	5-7, Banbury Road, Scunthorpe, N Lincolnshire, DN16 1UL	5.96	A20
Acetech Metals LTD	WE9406AA/A001	Acetech Metals, Dawes Lane, Scunthorpe, DN16 1DN	6.01	S1514
G P S Mobile Crushing Services Limited	AB3001LN/V004	52b & 52c, Colin Road, Scunthorpe, N Lincolnshire, DN16 1TT	6.10	A16
North Lincolnshire Council	DB3905LR/A001	21, Midland Road, Midland Road Ind Est, Scunthorpe, N Lincolnshire, DN16 1DQ	6.15	S1504
B M S Direct 2 U Ltd	JB3608UH/T001	Cooper House, Grange Lane North, Scunthorpe, N Lincolnshire, DN16 1BN	6.88	SR/21
S P B Aggregates Ltd	HB3706XT/T001	39, Hoylake Road, South Park Industrial Est, Scunthorpe, N Lincolnshire, DN17 2AZ	7.59	SR/12
Edley R C	WP3797FY/V005	3-6, Scotter Road South, Bottesford, Scunthorpe, N Lincolnshire, DN17 2BT	7.94	A19
North Lincolnshire Borough Council	KB3736RT/T001	Winterton C A Site, North Street, Winterton, Lincolnshire, DN15 9QN	8.45	A13
Severn Trent Water Ltd	ZP3598EY/V002	Scunthorpe S T W, Scotter Road South, Bottesford, Scunthorpe, N Lincolnshire, DN17 2BU	8.84	A23
Rockscape Energy Limited	FB3100GN/A001	Northmoor Farm, Crowle, N Lincolnshire, DN17 4DA	9.09	SR/17
Greenacres Pet Crematorium Limited	WE6161AA/A001	Greenacres, Scunthorpe, DN17 3AL	9.34	S0824

Name	Licence No.	Address	Distance (km)	Facility Type
Bill Jones & Steve Jones	DP3597FJ/V005	The Old Brick Works, Ealand, Scunthorpe, N Lincolnshire, DN17 4JP	9.40	SR/21
4 Recycling Ltd	GB3202XN/A001	Reading Gate, Swinefleet, Goole, East Yorkshire, DN14 8DT	9.66	A16

6.3 Regional Waste Management Facilities

6.3.1.1 The potential regional waste management capacity for the East Midlands (Lincolnshire) Region was evaluated using data from the Environment Agency. The following tables provide a summary for the East Midlands (Lincolnshire) Region (Waste Data Interrogator EA, 2019).

6.3.1.2 Table 4 lists the available landfills and their capacity in 2019. Landfill facilities included may only accept non-hazardous waste.

Table 4: Landfills available in Lincolnshire (2019)

All figures are provided in 000s cubic metres	Lincolnshire	
	Landfill inputs 2019	Landfill Capacity 2019
Landfill Type*		
Non Hazardous	381	9,030
Non Hazardous Restricted	0	0
Inert	78	1,331
Total	459	10,475

Table notes:

Data for 2019 is classified into Landfill Directive categories.

2019 landfill capacity data was obtained from environmental monitoring reports required by permits or directly from the operator.

6.3.1.3 Table 5 shows incinerators available and their capacity in 2019, which indicates the availability of similar waste management options to the Project.

Table 5: Incinerators available in Lincolnshire (2019)

All figures are provided in 000s cubic metres	Lincolnshire	
	Incineration throughput 2019	Incineration capacity 2019
Incineration type*		
Co-Incineration of Hazardous Waste	96	461
Municipal and/or Industrial & Commercial	178	170
Total	274	631

Table notes: This data is for the operational incineration facilities that accepted waste from off-site sources. It does not include facilities that burned waste from their own in-house processes or were non or pre-operational.

*No co-incineration, hazardous, animal by-product/carcass, sewage sludge, biomass/waste wood or clinical capacity.

6.3.1.4 Table 6 below indicates the total number of permitted waste facilities by waste treatment method in the Lincolnshire region. This would include smaller permitted facilities as well as those with a regional capacity.

Table 6: Number of Permitted Waste Facilities in East Midlands (2019)

Lincolnshire	
Landfill	4
On/In Land Disposal	4
Incineration	2
Transfer	33
Treatment	49
Metal Recovery	19
Mobile Plant	11
Combustion	1
Storage	4
Total	127

Table Notes: The number of active sites in 2019 represents those who submitted waste returns in these categories.

6.3.1.5 Table 7 shows the availability of incineration facilities that accepted waste in Lincolnshire during 2019.

Table 7: Availability of incineration facilities that accepted waste in Lincolnshire in 2019

Operator Name	Site Name	Site Address	Type	Permit Number	Total Waste Removed 2019 (tonnes)
Renewi UK Services Limited	Bentinck Generating Site - EPR/GP3636UH	Fosse Way, Widmerpool, Nottingham, Nottinghamshire, NG12 5PS,	Municipal Waste Incinerator	AP3432QC	28492.67
JG Pears Power (O&M) Ltd	Biomass Power Plant, Widmerpool, Nottingham EPR/QP3936AX	Bentinck Generating Site, Mill Lane, Kirkby in Ashfield, Nottinghamshire, NG17 9LG,	Co-Incinerator (Haz)	BL3269IH	13850.686
Castle Cement Limited	Boston Energy Production Facility EPR/UP3131DF	Boston Energy Production Facility, Riverside Industrial Estate, Marsh Lane, Boston, PE21 7TN,	Co-Incinerator (Haz)	BM0486IT	8381.96
Nexterra Operations Limited	Chelveston Non-Recyclable Plastic to Fuel Facility EPR/LP3592NM	Derby Alternative Energy Plant, Unit 1C and 1D Trafalgar Park, Victory Road, Derby, DE24 8DX,	Co-Incinerator	BP3731VJ	12904.19
Biomass UK No.3 Limited	Derby & Derbyshire Waste Treatment Centre - EPR/KP3236HW	Eastcroft Energy from Waste Plant, Cattle Market Road, Nottinghamshire, NG2 3JH,	Municipal Waste Incinerator	EP3034SN	885.98
Steetley Dolomite Limited	Derby Alternative Energy Plant EPR/FP3739VA	Hope Works, Pindale Road, Hope Valley, Derbyshire, S33 6RP,	Municipal Waste Incinerator	FP3739FS	258.267
Breedon Cement Limited	Eastcroft EFW Plant - EPR/EP3034SN	JG Pears Power (O&M) Ltd, Marnham Road, Newark, Nottinghamshire, NG23 6SP,	EFW Incinerator	FP3739VA	4605.49
Equitix ESI CHP (Nottingham) Limited	Hope Cement Works - EPR/BP3731VJ	Ketton Works, Ketton, Stamford, Lincolnshire, PE9 3SX,	Municipal Waste Incinerator	GP3636UH	1964.28

Operator Name	Site Name	Site Address	Type	Permit Number	Total Waste Removed 2019 (tonnes)
WasteNotts (Reclamation) Ltd	JG Pears Power (O&M) Ltd - EPR/MP3235CC	Land opposite the cottage , Upper Higham Lane, Higham Ferrers , Northamptonshir, NN10 0SU,	Municipal Waste Incinerator	KP3236HW	41388.22
FCC Environment (Lincolnshire) Limited	Ketton Works EPR/BM0486IT	Lincolnshire EfW Facility, Paving Way, off Whisby Road, North Hykeham, Lincoln, Lincolnshire, LN6 3QZ,	Animal By-Products Incinerator	MP3235CC	42355.38
Greenfield Properties UK Limited	Lincolnshire EfW Facility - EPR/FP3739FS	Sinfin Integrated Waste Treatment Facility, Sinfin Lane, Derbyshire, DE24 9GF,	EFW Incinerator	QP3936AX	3196.32
CEG Technology UK Limited	Welland Bio Power - EPR/AP3432QC	Welland Bio Power, Pebble Hall Farm, Theddingworth, Northamptonshire, LE17 6NJ,	Co-Incinerator (Haz)	UP3131DF	446.806
Warwick Energy (Bentinck) Limited	Whitwell Quarry Lime works	Whitwell Works, Southfield Lane, Whitwell, Worksop, Nottinghamshire, S80 3LJ,	Co-Incinerator (Haz)	YP3038JT	8.5

6.4 Regional Waste Facility Availability and Capacity

- 6.4.1.1 There are a number of landfill and incineration facilities within the East Midlands region with limited remaining capacity.
- 6.4.1.2 Most recent reports date from 2019, capacity would have since reduced further. Incinerator capacity was at or reaching capacity as shown in Table 5 and Table 7. Landfill facilities have limited capacity as shown in Table 4 when comparing the input in 2019 versus the remaining available capacity. Waste Interrogator Data (2019) shows landfill trends from 1998/99 to 2019 which shows a 50% reduction in landfill capacity. In 1998/99, Lincolnshire had 20,237,000 cubic metres of landfill capacity, in 2019 this has reduced to 10,475,000 cubic metres. This includes inert, non-inert and restricted user (non-hazardous and hazardous restricted landfill) sites. This rate of reducing landfill capacity is forecasted to increase with the strategy to remove landfill from the waste management options.
- 6.4.1.3 Waste arising from construction activities that cannot be recovered will be managed by local waste management facilities. The waste arising will be minimal and spread across a long period to ease capacity issues on existing infrastructure.
- 6.4.1.4 The regional need for this facility is to intercept the volume of RDF currently being exported through the Humber ports and the volume of household waste currently being landfilled in the East Midlands region. In addition, the closure of landfill sites and the tariffs being placed on exported waste due to waste levies being imposed by EU countries such as the Netherlands, will require additional energy recovery infrastructure to manage the excess waste above incinerator or landfill capacity. The report undertaken by AFRY titled 'RDF Supply Assessment' (**Document Reference 5.2**) analyses and forecasts waste availability in the region in detail. The report states that in a scenario in which England meets its existing recycling targets, an additional 4.7 million tonnes of recovery capacity is required to ensure that residual waste that cannot be recycled can be processed for energy recovery in 2035. The report also states that the Project is among the small minority of pipeline projects which are well placed to connect to a Carbon Capture, Usage, and Storage cluster.
- 6.4.1.5 Section 5.5.3 of the North Lincolnshire Council Waste Management Strategy discusses landfill capacity and states that the availability of current landfills cannot be guaranteed, input needs to reduce and additional landfill capacity may still be required over the longer term. The Waste Strategy for Lincolnshire forecasts a waste per head of population increase of 15% by 2031 with limited landfill and incinerator capacity to meet the increase.

7. MITIGATION

7.1.1.1 This section describes the mitigation measures considered in the assessment of effects. This includes mitigation that is integral to the design of the Project and good practice mitigation measures that the Project is committed to adopting. All the mitigation measures are committed to by the Project and the significance of the residual environmental effects takes into account adoption of these measures.

7.2 Construction Waste Management

7.2.1.1 A detailed construction Waste Management Plan (WMP) will be developed as part of the Construction Environmental Management Plan (CEMP), in consultation with the Environment Agency and North Lincolnshire Council. An outline construction WMP is provided as an appendix to the Code of Construction Practice (CoCP) (**Document Reference 6.3.7**). The detailed plan will identify:

- responsibilities for waste management;
- the waste category and quantities of materials generated;
- measures to reduce waste generation;
- opportunities for recycling and/or re-use;
- proposed treatment and disposal routes; and
- licensing requirements.

7.2.1.2 The WMP will include an audit programme to be undertaken to demonstrate compliance with statutory requirements.

7.2.1.3 Actual waste volume arisings will be monitored during the construction phase.

7.2.1.4 Spoil arising from the works that is classed as 'acceptable fill' will be used in construction works wherever practicable (dependent upon compliance with existing waste management legislation). The CL: AIRE Definition of Waste: Development Industry Code of Practice (DoW CoP) will be employed, allowing the reuse of excavated materials.

7.2.1.5 The disposal of waste, including any surplus spoil, will be minimised so far as is reasonably practicable. The environmental and development benefits from the use of surplus material will be maximised in order to reduce pressure on existing disposal facilities. The DoW CoP will be employed, allowing the movement and reuse of excavated materials between different parts of the site.

7.2.1.6 The WMP, along with best practice measures for the minimisation and management of waste, will be a component part of the CEMP (refer to CoCP, **Document Reference 6.3.7**).

- 7.2.1.7 The CEMP will be produced by the construction contractor in accordance with the provisions of the CoCP and include details on waste management during construction phases, including how it will be dealt with in compliance with relevant legislation.
- 7.2.1.8 Construction waste will be segregated into different labelled bunkers or segregated spoil heaps on site to facilitate reuse, appropriate disposal and to avoid contamination.
- 7.2.1.9 If encountered, hazardous waste, such as contaminated soils or asbestos, requiring special measures would be segregated from non-hazardous material, clearly labelled, stored temporarily and handled in accordance with relevant regulations, and transported in appropriate containers by licensed waste carriers to be treated at a licensed waste facility. Any contaminated material encountered will be removed from the site if on-site remediation is not practicable.
- 7.2.1.10 Material that is considered reusable in the construction of the Project or associated works will be stockpiled in accordance with a material movement and stockpile strategy to be drafted and included in the Soil Management Plan (SMP) to be included in the CEMP. An outline SMP is provided as an appendix to the CoCP (see Annex 7 to the ES, **Document Reference 6.3.7**). The SMP will describe the working methods for the removal, segregation, and organised stockpiling of excavated material across the whole Project. Based on the outcome of the material assessment, areas within the Order Limits will be identified for stockpiling of topsoil, subsoil, reclaimed construction material and material unsuitable for reuse, which would be removed from the site.
- 7.2.1.11 The proximity principle will be applied, whereby construction waste material unsuitable for reuse that is exported off-site will be treated or disposed of as close to the point of generation as reasonably practicable.
- 7.2.1.12 Appropriate analysis of material that is considered reusable in the construction of the Project will be carried out to establish if it is suitable for the proposed use, does not contain material that can cause harm to human health or the environment and does not require further treatment prior to use.
- 7.2.1.13 Concrete and demolition rubble will be assessed to establish if it can be crushed, screened and used as recycled aggregate for backfill. Such processing may be done on or off-site by a suitable contractor.
- 7.2.1.14 Biodegradable waste from vegetation clearance and tree removal will be sent for local composting or anaerobic digestion.

7.3 Operational Waste Management

- 7.3.1.1 The feedstock for the ERF will be RDF and non-hazardous household and commercial waste, with an anticipated feedstock of up to 760,000 tonnes to be accepted at the ERF per annum. This tonnage includes the feedstock

- for the plastic recycling facility which is estimated to total of up to 25,000 tonnes.
- 7.3.1.2 The RDF accepted as fuel is not considered as a waste derived from the Project.
- 7.3.1.3 The Project aims to be as sustainable and energy efficient as possible, by taking waste and turning it into a usable commodity. It is for this reason that the ERF is coupled with a concrete block manufacturing facility (CBMF), which will take the waste generated by the ERF (in the form of incinerator bottom ash (IBA) and Flue Gas Treatment Residue (FGTr)) and turn it into a valuable product. The CBMF will receive approximately 125,000 tonnes of treated IBA and FGTr per year.
- 7.3.1.4 IBA and FGTr from the ERF will be transferred to the CBMP following on-site treatment. The ash handling and treatment facility will not generate any solid waste, but will process the ash from the ERF with the captured CO₂ to formulate cement.
- 7.3.1.5 The CBMF will combine the treated ash with imported sand and cement, delivered by road, river and train, to manufacture 285,000 tonnes of concrete blocks per year. The manufactured blocks will then be exported to market from the Project via road, river and train.
- 7.3.1.6 This process will result in a small quantity of rejected incinerator bottom ash requiring disposal via landfill. It is assumed the rejected incinerator bottom ash will be non-hazardous.
- 7.3.1.7 A plastic recycling facility (PRF) will be constructed to take source-segregated waste plastics (PET, HDPE, and PP) and treat this incoming feedstock through a series of washing, grinding, sorting and extruding process to produce polymers, pellets or flakes of 'raw' plastic, free of contaminants, which can then be used to manufacture new plastic products without the use of fossil fuels.
- 7.3.1.8 Ferrous metals arising from the plastic recycling facility will be recovered for recycling or sale and oversize material will be fed into the ERF.
- 7.3.1.9 Approximately 24,000 tonnes of clean and re-usable plastic flakes or polymers will be produced per annum, which would displace the use of fossil fuels. Up to 500 tonnes per annum of metals will be produced, with up to 500 tonnes of unsuitable oversize material processed by the energy recovery facility.
- 7.3.1.10 A water treatment facility will take water from the mains supply and treat it to remove impurities to make it suitable for use in the boiler and carbon capture plant. The rejected water from this process will be used in other processes within the ERF and will ultimately be discharged to the bottom ash extractor. The ERF will be designed to be zero-discharge, with no effluent discharged to sewer. However, effluent may be created by high

water demand and in this event would be stored on site and either discharged to the local sewerage network or exported via tankers.

7.4 General Good Practice Waste Management

7.4.1.1 Best practice measures are required to minimise waste, improve reuse, recovery and recycling, and to facilitate high standards of waste management. This is in addition to specific construction and operational waste management measures.

7.4.1.2 The waste hierarchy will be applied to reduce waste, reuse, recycle or recover materials to reduce the effects of waste generation and treatment.

7.4.1.3 The waste producer has a duty of care and legal responsibility to ensure that waste products are managed safely and in compliance with applicable regulations.

7.4.1.4 Regulations require that the following actions will be applied to the extent they are relevant:

- Store waste in a secure place;
- Use suitable containers that will stop waste escaping;
- Keep liquid hazardous waste in a dedicated area, preferably inside a building with an impermeable bund or barrier to contain spills and leaks;
- Classify waste appropriately as per the European Waste Catalogue (EWC);
- Label containers clearly with the type of waste they contain;
- Use covers to reduce rainwater contamination, waste blowing away or contamination that would reduce the waste from being reused;
- Store different types of waste separately, so that they do not contaminate each other so that they can be reused more easily and the site's operator can complete the waste transfer note correctly;
- Prohibit the mixing of hazardous and non-hazardous waste;
- Maintain intact impermeable floors so that any spillage (solids or liquids) cannot escape and cause land or groundwater contamination, or further deterioration of floors;
- Have sufficient space and storage systems to enable products to be segregated;
- Abide by the maximum periods and volumes of wastes that can be temporarily stored on site prior to collection;
- Maintain waste records for a minimum of 3 years including the quantity, nature, origin and, where relevant, the destination, frequency of collection, mode of transport and treatment method of the waste; and

- Only use waste vendors with the appropriate permits to collect, handle, and transport and treat the waste in accordance with applicable regulations.

8. ASSESSMENT OF LIKELY EFFECTS

8.1.1.1 This section identifies and assesses effects arising from the generation of waste during the construction and operational phases of the Project. The assessment of significance takes into consideration the mitigation measures described in Section 7.

8.2 Construction Waste Arising

8.2.1.1 For the purposes of this assessment, worst-case assumptions have been made for the generation of material from the construction phase for site clearance, excavations and ancillary works as shown in Table 8.

8.2.1.2 The detailed composition of material generated during the construction phase has not been shown; however, reasonable worst-case assumptions have been made on the likely volumes and percentages of hazardous waste arising.

8.2.1.3 It has been assumed for the purposes of this assessment that as much non-hazardous and inert waste arising from site clearance and excavations as possible will be recovered and reused in accordance with the waste hierarchy. There will be sufficient capacity on the site to reuse non-hazardous excavated material. It is not expected that large amounts of such material will require removal from the site and subsequently the effects on existing capacity at local and regional waste management facilities are not likely to be significant.

8.2.1.4 There are a number of buildings and structures that require demolition prior to the commencement of construction of the Project. There has been no allowance for re-use and recycling of materials from the demolition of the buildings and structures. However, the waste arising from demolition activities is not expected to give rise to significant effects on existing capacity at regional waste management facilities. The agricultural grain storage facility will be dismantled and moved to another site on the land owners' estate.

8.2.1.5 It has been assumed that waste arising for removal and disposal off site will be treated at local or regional waste management facilities taking into consideration the proximity principle for waste management.

8.2.1.6 The Indicative Phasing Plan for the Project (**Document Reference: 4.9**) anticipates that the construction will be in six phases and several sub-phases over six years, which will spread out the generation of waste over an extended timeframe, which will also alleviate the small residual pressure on existing capacity.

8.2.1.7 The sensitivity of the local waste treatment and disposal facilities is insignificant as the volumes of waste after mitigation over this period are limited. It is unlikely that there will be significant direct, permanent or long-term effects on local waste treatment and disposal facilities.

8.2.1.8 Likely effects that have been identified during the construction phase of the Project are not expected to give rise to significant long-term effects.

Table 8: Estimated Construction Waste Volumes

Construction Activity	Volume of material generated (m ³)	Waste Hierarchy Application
Site Strip	106,900	Reuse off site
Earthworks (Cut)	80,960	Reuse on site
	20,240	Disposal
Flood Retention	6,300	Reuse on site
	700	Disposal
	8,319	Reuse on site
	924	Disposal
Utilities	3080	Reuse on site
	344	Disposal
	48.5	Reuse on site
	6	Disposal
Site Clearance	112,800	Reuse off site
	28,200	Disposal
Railway	4,200	Reuse off site
Demolition (foundation from demolished building)	11,854	Reuse off site
	1,317	Disposal
Demolition (buildings)	98,738	Disposal

8.3 Operational Waste Composition and Quantities

8.3.1.1 The feedstock for the ERF will be RDF and non-hazardous household and commercial waste, with an anticipated feedstock of up to 760,000 tonnes to be accepted at the ERF per annum as shown in Appendix A.

8.3.1.2 The primary sources of wastes and effluents in the ERF will be ash from the combustion process, flue gas and flue gas treatment residues from the water treatment plant. Both incinerator bottom ash (IBA) and FGTr will be transferred to the concrete manufacturing plant following on-site treatment.

8.3.1.3 An estimated approximately 125,000 tonnes of treated IBA and FGTr per year will be generated which will be used in the CBMF for the manufacture of concrete or concrete blocks. The ash handling and treatment facility will not generate any notable volumes of solid wastes but will process the waste from the ERF to make it re-usable within the CBMF as shown in Appendix A.

- 8.3.1.4 The manufacture of concrete blocks will generate approximately 2,720 tonnes per annum of rejected incinerator bottom ash for disposal via landfill as shown in Appendix A, Figure 3.
- 8.3.1.5 Approximately 3,750 tonnes of ferrous metals per annum will be recovered for recycling from the CBMF as shown in Appendix A, Figure 3.
- 8.3.1.6 The PRF will generate up to 9,800 tonnes of waste water per year, up to 500 tonnes of metals and up to 500 tonnes of oversize materials. Metals will be removed from site for recycling or sale and oversize material will be disposed of in the ERF as shown in Appendix A, Figure 4.
- 8.3.1.7 Effluent from the water treatment facility created by high water demand will be stored on site and either discharged to the local sewerage network or periodically removed by tanker to an appropriately licenced waste treatment facility.
- 8.3.1.8 Municipal and recyclable waste will be generated by offices, shop, bathrooms etc. Waste from these facilities will be collected as part of the wider municipal waste collection and recycled or disposed of by a licenced waste contractor or fed into the ERF. The operational municipal waste arising is considered to be negligible.
- 8.3.1.9 The electric vehicle and hydrogen (H₂) re-fuelling station will not generate any waste as a result of its primary operational function.
- 8.3.1.10 The waste removed from site for disposal is expected to be a small percentage of overall volumes accepted and generated; therefore, subsequent effects of any eventual disposal are not likely to be significant.
- 8.3.1.11 As there is a regional need for a waste treatment facility to intercept the volume of RDF currently being exported through the Humber ports and the volume of household waste currently being landfilled in the East Midlands region the effects on local capacity can be considered to be positive.
- 8.3.1.12 The Project will enable the proximity principle whereby waste will be disposed or recovered near to source, by means of the most appropriate methods and technologies, in order to ensure a high level of protection for the environment and public health.
- 8.3.1.13 Likely negative effects that have been identified as potentially occurring as a result of the operational phase of the Project are considered not significant.

9. CONCLUSIONS

9.1 Construction Waste Management

- 9.1.1.1 The greatest potential impacts regarding waste management will be during the construction phases from site preparation, excavation and potential encounters with contaminated materials.
- 9.1.1.2 The implementation of measures contained in the Construction WMP and best practice measures related to waste management as outlined in Section 7 of this Chapter will mitigate the majority of effects from the construction phase. Addressing issues associated with encountering contaminated materials will be addressed through the CEMP (see also Chapter 8 Ground Conditions, Contaminated Land (**Document Reference 6.2.8**), and the outline Remediation Strategy appendix to the CoCP, Annex 7 (**Document Reference 6.3.7**)).
- 9.1.1.3 There has been no allowance made at this stage of the assessment for re-use and recycling of materials from the demolition of the buildings and structures. Assessment at the time of construction will be required within the CEMP and Construction WMP to establish the amount of non-hazardous and inert waste, which will arise from demolitions and can be recovered and reused to further reduce the volumes of waste removed from site.
- 9.1.1.4 As construction methods are further developed, the aim will be to maximise the balancing of cut and fill so that possible inert and non-hazardous material from site clearance and excavations can be stockpiled and reused to reduce the use of imported material to backfill foundations and minimise the volumes removed from site.
- 9.1.1.5 As there is further potential to apply the waste hierarchy and likely to be no significant effects on existing waste management capacity, with the mitigation described in this chapter there will be no significant effects associated with construction waste management.
- 9.1.1.6 Monitoring will be undertaken as a normal part of the Construction WMP.

9.2 Operational Waste Management

- 9.2.1.1 With the proposed mitigation in place, as identified in Section 7.3 and 7.4, and the requirement to operate within the conditions of an Environmental Permit there will be no significant waste management effects during operation.
- 9.2.1.2 As there is a regional need to intercept the volume of RDF currently being exported through the Humber ports and the volume of household waste currently being landfilled in the East Midlands region, the effects on local capacity can be considered to be positive.

9.2.1.3 Monitoring will be undertaken during operation in accordance with the environmental permit.

10. REFERENCES

- National Planning Policy Framework (2021)
- Waste Management Plan for England (2021)
- Waste Data Interrogator (2019)
- Waste Hierarchy Guidance
- UK Environmental Agency Public Registers
- North Lincolnshire Waste Management Strategy (2012)
- Waste Management Strategy for Lincolnshire (2019)
- North Lincolnshire Local Plan (2003)
- Waste Policy in England (2011)
- National Planning Policy for Waste (2014)

APPENDIX A FIGURES

May 2022

Figure 2 ERF Process Flow Diagram

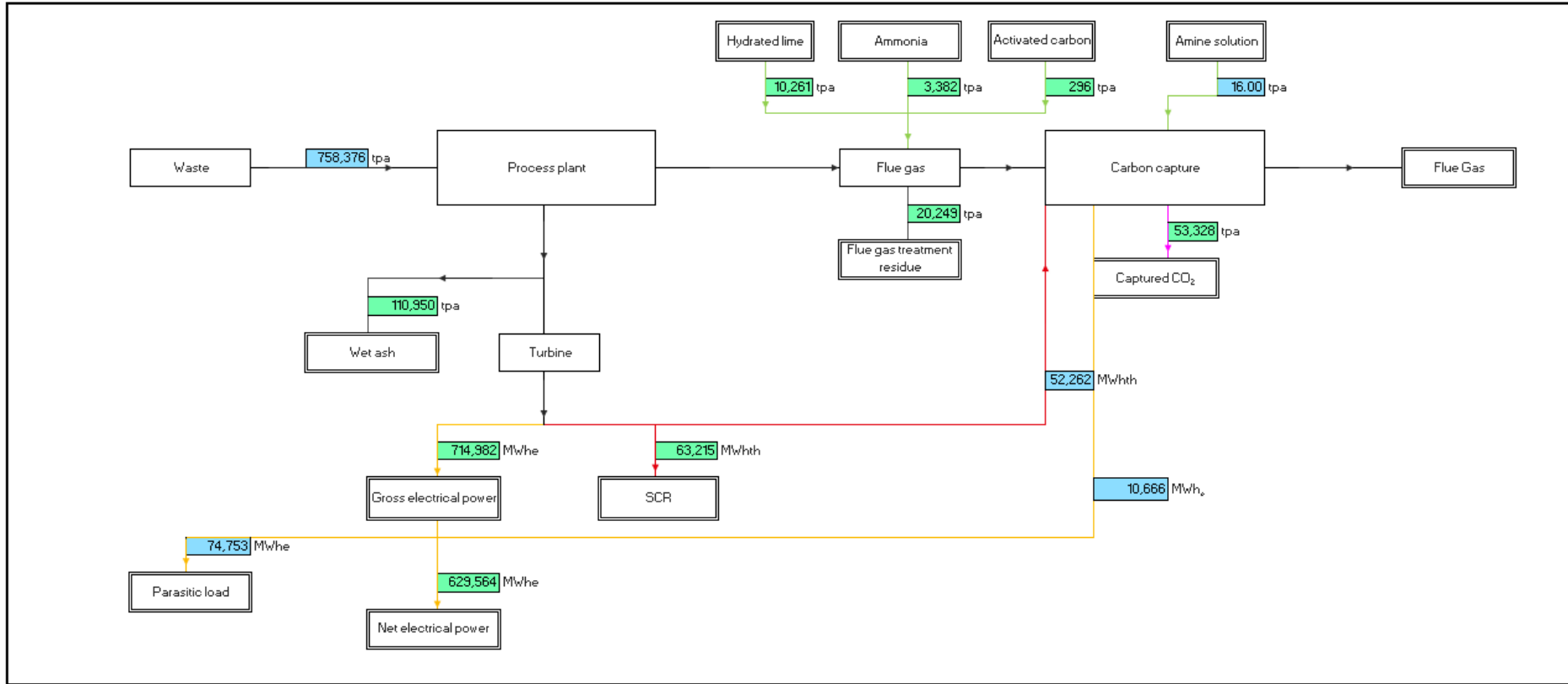


Figure 3 Concrete Block Manufacturing Facility Process Flow Diagram

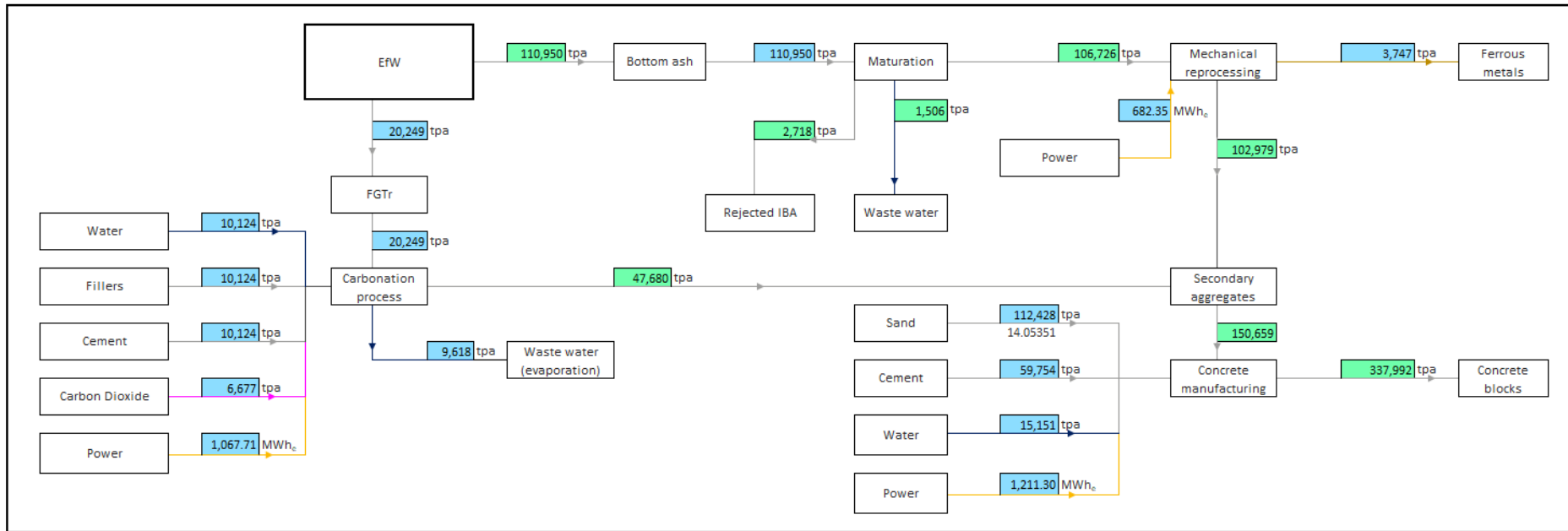


Figure 4 Plastic Recycling Facility Process Flow Diagram

