



The Grid Link Project

Constraints Report

Prepared for EirGrid by RPS Group
AUGUST 2012



TABLE OF CONTENTS

1	EXECUTIVE SUMMARY.....	1
2	INTRODUCTION, BACKGROUND AND CONTEXT	5
2.1	PURPOSE OF THIS REPORT	5
2.2	TERMS OF REFERENCE FOR THE GRID LINK PROJECT	6
2.3	KEY STAGES IN DEVELOPING THE GRID LINK PROJECT.....	6
2.4	STUDY TEAM	7
3	APPROACH TO IDENTIFICATION OF CONSTRAINTS.....	9
3.1	CONFIRMATION OF THE STUDY AREA.....	9
3.2	DATA GATHERING AND IDENTIFICATION OF CONSTRAINTS	9
3.3	CONSULTATION	9
3.4	MAPPING OF CONSTRAINTS.....	9
3.5	PREPARATION OF CONSTRAINTS REPORT.....	10
3.6	INFORMATION SOURCES USED	10
3.7	DATA CHALLENGES.....	11
4	WORK TO DATE	12
4.1	IDENTIFICATION OF STUDY AREA.....	12
4.2	GRID25 IMPLEMENTATION PROGRAMME STRATEGIC ENVIRONMENTAL ASSESSMENT AND STRATEGIC ENVIRONMENTAL CONSTRAINTS MAPPING.....	13
5	PUBLIC CONSULTATION AND KEY ISSUES RAISED	16
5.1	KEY THEMES RAISED DURING PUBLIC CONSULTATION	16
5.2	ENVIRONMENTAL STAKEHOLDERS.....	17
6	PLANNING, PROCEDURAL AND LEGAL CONSIDERATIONS	19
6.1	REGULATORY FRAMEWORK.....	19
6.1.1	Strategic Infrastructure Development.....	19
6.1.2	Environmental Impact Assessment (EIA).....	19
6.1.3	Other Relevant Environmental Legislation.....	20
6.2	STRATEGIC POLICY CONTEXT	20
7	TECHNICAL CONSIDERATIONS	21
7.1	SUB-STATIONS	21
7.2	OVERHEAD LINE CORRIDOR.....	22
7.2.1	Technical Limitations.....	22
7.2.2	Existing and Proposed Infrastructure	22
7.2.3	Topography and Land Features.....	24
7.2.4	Construction	25
8	ENVIRONMENTAL CONSIDERATIONS	26
8.1	POPULATION AND SETTLEMENT PATTERNS.....	27
8.1.1	Objective.....	27
8.1.2	Scope	27

8.1.3	What is the Issue?	27
8.1.4	Baseline Information	28
8.1.5	Key Considerations	28
8.2	CULTURAL HERITAGE	33
8.2.1	Objective	33
8.2.2	Scope	33
8.2.3	What is the Issue?	33
8.2.4	Baseline Information for Region	34
8.2.5	Key Considerations	34
8.3	LAND USE	45
8.3.1	Objective	45
8.3.2	Scope	45
8.3.3	What is the Issue?	45
8.3.4	Baseline Information for Region	46
8.3.5	Key Considerations	47
8.4	INFRASTRUCTURE AND UTILITIES	57
8.4.1	Objective	57
8.4.2	Scope	57
8.4.3	What is the Issue?	57
8.4.4	Baseline Information for Region	57
8.4.5	Key Considerations	57
8.5	SOILS AND GEOLOGY	66
8.5.1	Objective	66
8.5.2	Scope	66
8.5.3	What is the Issue?	66
8.5.4	Baseline Information for Region	68
8.5.5	Key Considerations	68
8.6	BIODIVERSITY	71
8.6.1	Objective	71
8.6.2	Scope	71
8.6.3	What is the Issue?	72
8.6.4	Baseline Information for Region	72
8.6.5	Key Considerations	72
8.7	WATER	86
8.7.1	Objective	86
8.7.2	Scope	86
8.7.3	What is the Issue?	86
8.7.4	Baseline Information for Region	87
8.7.5	Key Considerations	87
8.8	LANDSCAPE AND VISUAL	98

8.8.1 Objective..... 98

8.8.2 Scope 98

8.8.3 What is the Issue?..... 98

8.8.4 Baseline Information for the Region 99

8.8.5 Key Considerations 99

9 NEXT STEPS 101

9.1.1 Objectives from SEA of the Grid25 IP 101

LIST OF FIGURES

Figure 2.1:	Stages in EirGrid's Roadmap.....	8
Figure 4.1:	Project Study Area	14
Figure 4.2:	Sector Map for EirGrid Strategic Environmental Constraints Mapping.....	15
Figure 8.1.3 (1):	Population Density.....	29
Figure 8.1.3 (2):	Population Density.....	30
Figure 8.1.3 (3):	Population Density.....	31
Figure 8.1.3 (4):	Population Density.....	32
Figure 8.2.1:	Record of Monuments and Places (RMP) Distribution Map	40
Figure 8.2.2:	National Monument, Preservation Order, Register of Historic Monuments and World Heritage Tentative Distribution Map.....	41
Figure 8.2.3:	Record of Protected Structures (RPS) Distribution Map	42
Figure 8.2.4:	NIAH Distribution Map	43
Figure 8.2.5:	NIAH Historic Garden and Designed Landscape Survey Distribution Map	44
Figure 8.3.1 (1):	Land Use Within the Study Area - Corine Land Cover 2006.....	48
Figure 8.3.1 (2):	Land Use Within the Study Area - Corine Land Cover 2006.....	49
Figure 8.3.1 (3):	Land Use Within the Study Area - Corine Land Cover 2006.....	50
Figure 8.3.1 (4):	Land Use Within the Study Area - Corine Land Cover 2006.....	51
Figure 8.3.2 (1):	Land Uses Within the Study Area - Other	52
Figure 8.3.2 (2):	Land Uses Within the Study Area - Other	53

Figure 8.3.2 (3):	Land Uses Within the Study Area - Other	54
Figure 8.3.2 (4):	Land Uses Within the Study Area - Other	55
Figure 8.3.3:	Marine Uses Within the Study Area	56
Figure 8.4.1 (1):	Infrastructure - Transport and Topography	58
Figure 8.4.1 (2):	Infrastructure - Transport and Topography	59
Figure 8.4.1 (3):	Infrastructure - Transport and Topography	60
Figure 8.4.1 (4):	Infrastructure - Transport and Topography	61
Figure 8.4.2 (1):	Infrastructure – Energy and Water	62
Figure 8.4.2 (2):	Infrastructure – Energy and Water	63
Figure 8.4.2 (3):	Infrastructure – Energy and Water	64
Figure 8.4.2 (4):	Infrastructure – Energy and Water	65
Figure 8.5.1:	Aquifer Vulnerability	69
Figure 8.5.2:	Geological Heritage Sites and Landslide Susceptibility	70
Figure 8.6.1 (1):	Biodiversity (European) Within the Study Area	74
Figure 8.6.1 (2):	Biodiversity (European) Within the Study Area	75
Figure 8.6.1 (3):	Biodiversity (European) Within the Study Area	76
Figure 8.6.1 (4):	Biodiversity (European) Within the Study Area	77
Figure 8.6.2 (1):	Biodiversity (Terrestrial) Within the Study Area.....	78
Figure 8.6.2 (2):	Biodiversity (Terrestrial) Within the Study Area.....	79
Figure 8.6.2 (3):	Biodiversity (Terrestrial) Within the Study Area.....	80

Figure 8.6.2 (4):	Biodiversity (Terrestrial) Within the Study Area.....	81
Figure 8.6.3 (1):	Biodiversity (Aquatic) Within the Study Area.....	82
Figure 8.6.3 (2):	Biodiversity (Aquatic) Within the Study Area.....	83
Figure 8.6.3 (3):	Biodiversity (Aquatic) Within the Study Area.....	84
Figure 8.6.3 (4):	Biodiversity (Aquatic) Within the Study Area.....	85
Figure 8.7.1:	River Basin Districts Traversed by the Study Area.....	88
Figure 8.7.2:	Ecological Status of All Surface Waters within the Study Area.....	89
Figure 8.7.3:	Surface Water Chemical Status in the Study Area.....	90
Figure 8.7.4:	Ground Water Status within the Study Area.....	91
Figure 8.7.5:	High Status Sites in the Study Area.....	92
Figure 8.7.6:	High Pressure Sites.....	93
Figure 8.7.7 (1):	OPW Flood Plain Data.....	94
Figure 8.7.7 (2):	OPW Flood Plain Data.....	95
Figure 8.7.7 (3):	OPW Flood Plain Data.....	96
Figure 8.7.7 (4):	OPW Flood Plain Data.....	97

APPENDICES

Appendix A:	Baseline Information for the Region
Appendix B:	Principal Datasets Used
Appendix C:	County Development Plans Relevant to the Study Area
Appendix D:	Cultural Heritage Report
Appendix E:	Proposed Natural Heritage Areas (pNHA)
Appendix F:	Landscape and Visual: Overview of Each County
Appendix G:	Landscape Figures

ABBREVIATIONS AND GLOSSARY

ACA	Architectural Conservation Area A place, area, group of structures or townscape that is of special architectural, historical, archaeological, technical, social, cultural, or scientific, interest, or that contributes to the appreciation of a Protected Structure.
AIS	Air Insulated Switchgear
ASI	Archaeological Survey of Ireland
Biodiversity	Word commonly used for biological diversity and defined as assemblage of living organisms from all habitats including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part.
BOD	Biological Oxygen Demand
Circuit	A line or cable, including associated switchgear, which carries electrical power.
Constraint	A Constraint can be described as any physical, technical, legal, environmental, topographical or other consideration that may potentially affect, limit, restrict or confine the location or other aspect of the project, within the study area.
CDP	County Development Plan
Corine	Coordination of Information on the Environment Dataset created from satellite imagery and represents different cover/land use classifications throughout Europe.
DAHG	Department of Arts Heritage and Gaeltacht
EirGrid	The statutory electricity Transmission System Operator
EirGrid Roadmap	EirGrid's development framework for projects under the Grid25 strategy
EIA	Environmental Impact Assessment EIA is the process by which the anticipated effects on the environment of a proposed development or project are measured as required under Directive (85/337/EEC) as amended.
EIS	Environmental Impact Statement This is the output from the EIA process.
ELF	Extremely Low Frequency
EMF	Electro-Magnetic Field
Fauna	All animal life occurring in an area
Flora	All plant life occurring in an area
Geo-directory Data	Dataset which provides spatial and attribute information of the location of all buildings in Republic of Ireland
GIS	Geographic Information System A geographic information system captures, stores, analyses, manages, and presents data that is linked to location.
GIS	Gas Insulated Switchgear
Grid	A meshed network of high voltage lines and cables (400 kV, 220 kV and 110 kV) for the transmission of bulk electricity supplies around Ireland.

Habitat	A habitat is an ecological or environmental area that is inhabited by a particular animal and plant species. It is the natural environment in which an organism lives, or the physical environment that surrounds (influences and is utilized by) a species.
NPWS	National Parks and Wildlife Service. The NPWS is part of the Department of Arts, Heritage and Gaeltacht and is charged with the conservation of a range of habitats and species in Ireland.
HVAC	High Voltage Alternating Current.
Natura 2000	Natura 2000 sites are part of a coherent European ecological network of special areas of conservation designated under Article 3 of the Habitats Directive (92/43/EEC) and include Special Areas of Conservation (SAC) and Special Protection Areas (SPA).
NIS	Natura Impact Statement The output from the Appropriate Assessment process, required under the EU Habitats Directive 92/43/EEC
NGR	National Grid Reference
NHA	Natural Heritage Area In the Republic of Ireland the basic designation for wildlife is the Natural Heritage Area (NHA). This is an area considered important for the habitats present or which holds species of plants and animals whose habitat needs protection.
Nature Reserves	Nature reserves are chosen from among the very best examples of our wildlife, habitats and geology. They contain a wide range of species, communities and geology and their designation is a public recognition by Government of their importance.
NIAH	National Inventory of Architectural Heritage
NMA	National Monuments Act
NMI	National Museum of Ireland
NMS	National Monuments Service
OHL	Overhead Line
Ramsar Site	The Convention on Wetlands, signed in Ramsar, Iran, in 1971, is an intergovernmental treaty which provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.
Raster	A data structure representing a generally rectangular grid of pixels, or points of colour, viewable via a monitor, paper, or other display medium.
RBD	River Basin District Administrative area for coordinated water management, composed of multiple river basins (or catchments).
RPS	Record of Protected Structure
RMP	Record of Monuments and Places
SEA	Strategic Environmental Assessment Requirement for assessment of Plans and Programmes under the EU SEA Directive 2001/42/EC
SAC	Special Areas of Conservation SAC are those which have been given greater protection under the European Habitats Directive (92/43/EEC). They have been designated

	because of a possible threat to the special habitats or species which they contain.
SIA	Strategic Infrastructure Act
SID	Strategic Infrastructure Development Section 182A of the Planning and Development Act (2000 as amended) denotes transmission infrastructure development to be strategic infrastructure development, requiring direct application for Approval to An Bord Pleanála instead of the local planning authority.
SPA	Special Protection Areas SPA are designated under the European Commission Directive on the Conservation of Wild Birds (The Birds Directive). All European Community member States are required to identify internationally important areas for breeding, over-wintering and migrating birds and designate them as Special Protection Areas (SPA).
SMR	Sites and Monuments Record (predecessor of RMP)
WFD	Water Framework Directive (2000/60/EEC) WFD is European legislation that promotes a new approach to water management through river basin planning. It covers inland surface waters, estuarine waters, coastal waters and groundwater.
Working Width	Working area required to install transmission lines particularly for underground construction methodologies.

1 EXECUTIVE SUMMARY

INTRODUCTION

This Executive Summary introduces an overview of the Constraints Report prepared by RPS on behalf of EirGrid for the Grid Link Project, a proposed 400 kV High Voltage Alternating Current (HVAC) overhead line (OHL) linking existing nodal points at Knockraha, Co. Cork and Dunstown, Co. Kildare via Great Island, Co. Wexford. The Grid Link Project is required to help secure Ireland's electricity supply for the future. When complete the project will strengthen the transmission system in the south and east of Ireland and provide greater capacity to facilitate the integration of both thermal and renewable generation. The new circuit will also improve the efficiency of the electricity grid and facilitate future interconnection with the UK and/ or mainland Europe.

EIRGRID APPROACH TO PLANNING

The EirGrid approach to planning for high voltage overhead power line projects is based on five stages as set out on the EirGrid Project Development and Consultation Roadmap in **Figure 2.1** and the *Approach to the Development of Electricity Transmission Lines*.

One of the first outputs from Stage 1 of the Roadmap was to develop a study area. This was completed in March 2012 and the proposed study area went on public display from April 12th to June 8th 2012. Taking into account the submissions made during the consultation period, the final study area has now been established. The study area includes all of counties Carlow, Waterford, Wexford and Wicklow, most of Kilkenny, and to a lesser extent Cork, Dublin, Kildare, Laois, and Tipperary. A small portion of County Limerick is also included within the study area.

As part of the initial steps of developing the project it is necessary to identify and map where possible those constraints and considerations which may affect the route identification for the Grid Link Project. This report sets out in detail the information gathered to date with regard to such considerations and constraints. In line with Stage 1 of the EirGrid *Approach to the Development of Electricity Transmission Lines*, the focus at this stage is:

"...primarily on gathering environmental, social, technical and other information to inform and shape the project."

This stage does not involve making binding decisions regarding the detailed nature, extent and location of the project, but simply gathering as much information as possible to ensure a balanced and robust outcome later in the process."

WHAT IS A CONSTRAINT?

A Constraint can be described as any physical, technical, legal, environmental, topographical or other consideration that may potentially affect, limit, restrict or confine the location or other aspect of the project, within the study area.

This broad description of "constraint" thereby incorporates two strands: it includes factors which could comprise potential obstacles in the identification of substation locations, route corridors and line routes, and might best be avoided where possible or appropriate; it also includes considerations which will assist in defining the final nature of the project. Constraints as defined above are identified to ensure a comprehensive understanding of the study area.

Constraints are also mapped to help facilitate the identification of corridors. In line with EirGrid's Roadmap, Stage 1 is the main information-gathering phase of the assessment process and information gathered at this time provides a baseline which can then be further developed at corridor identification stage and beyond. In order to achieve a full understanding of the study area, a comprehensive body of data has been collated, some of which will only become relevant at later stages in the process but all of which is important in building up a picture of the study area and all of which ultimately contributes to making an informed decision on how the project will develop.

The report identifies a number of constraints as being of primary importance for the corridor identification for the Grid Link Project. It also considers other issues more broadly e.g. planning and legal considerations, which although not considered an obstacle for the purposes of corridor identification, potentially comprise issues for the later stages of route identification and environmental impact assessment, as per the Roadmap. Such considerations will be dealt with at the appropriate stage of the project development. This is not to suggest that these other issues are unimportant, rather that there are some issues that are of greater significance to the overall development of the project at the corridor identification stage.

APPROACH TO CONSTRAINTS REPORT

In completing the Constraints Report, the project team undertook a desk based study of the regions and acquired data from various local and government authorities. The data gathered along with consultation feedback has played a large part in informing the Constraints Report.

The Constraints Report addresses the following:

- Planning Considerations relevant to the Grid Link Project;
- Technical Considerations relevant to the Grid Link Project;
- Environmental Considerations relevant to the Grid Link Project including:
 - Population and Settlement Patterns;
 - Land Use;
 - Infrastructure and Utilities;
 - Cultural Heritage;
 - Biodiversity;
 - Water,
 - Landscape and Visual; and
 - Soils and Geology.

APPROACH TO CONSTRAINTS MAPPING

The establishment of the constraints mapping has been facilitated through the use of a Geographic Information System (GIS). A comprehensive GIS Database (ESRI File GeoDatabase) has been developed and populated with the individual constraints layers and the background data received. Specialised modules of the ArcGIS software are used for spatial analysis such as deriving slope and elevation. The main output from the database has been a series of maps which spatially represent constraints within the study area.

The majority of datasets have been sourced from well established statutory and non-statutory bodies such as the EPA, NPWS, local authorities, Bat Conservation Ireland. In some cases, datasets could not be sourced and in those cases, if possible, features have been mapped by the project team based on available information, e.g. important tourism sites. It is noted that not everything identified in the text has been mapped due to the nature of the information, e.g. festivals have been highlighted in the text but are not depicted on the mapping.

SOURCES OF DATA USED

The data collection for the constraints stage has focused on determining what constraints exist that could significantly influence the design, location or progress of the project. This report records the collection of data to the end of July 2012.

A wide variety of data and information sources were used in the preparation of this report. In general these included:

- Relevant papers, electronic or web based data obtained from various agencies, e.g. databases such as the EPA's environmental mapping system ENVision, the GIS databases compiled as part of implementation of the Water Framework Directive and the National Parks and Wildlife Service database;
- Data and information obtained through consultations with local authorities and regulatory agencies; and
- Data and information obtained through consultations with the public by means of public information centres and project offices.

At the corridor identification stage, given the size of the study area, the focus of mapping constraints has principally been at a European, national and regional level and based on desktop information. Some of the information gathered to date, and addressed in this report, will only become relevant at later stages of the project, primarily related to route selection and environmental impact assessment, but, in the interest of creating a clear understanding of the receiving environment of the study area, this data has been collated as early as possible in the process. At route alignment stage, the information gathered to date will be supplemented by more regional and local level information depending on the location of corridors and ultimately the proposed alignment for the Grid Link Project. This more focused and detailed local information will be reflected in the decision making process as the project progresses.

LAYOUT OF REPORT

The initial chapters in this Constraints Report provide background to the project and information on the approach taken for the constraints stage for the Grid Link Project. Separate chapters then deal with the legal, planning, technical, and environmental considerations for the study area. Finally, the next steps in the project development process are outlined and note the further consultation opportunities for the public and all interested parties.

NEXT STEPS

Following Consultation 2, the Constraints Report will be updated based on feedback and observations by stakeholders and will then be confirmed. The Constraints Report, together with professional judgment and consultation feedback, will be used to identify corridors. The methodology for determining corridors broadly consists of the following steps:

- Consider all feedback from Consultations 1 and 2 and confirm Constraints Report.
- Categorise the constraints.
- Identify areas that may present opportunities for development of corridors.
- Ensure that corridors meet the objectives of the project.
- The Project Team is seeking the views of the public, statutory bodies and local authorities, on the detail within this Constraints Report and how it should be used in developing corridor options.

The Project Team welcomes comments on this Constraints Report which can be sent:

- By email to gridlink@eirgrid.com
- By telephone to our free phone number Lo-call 1890 422 122 (lines open between 12am to 6pm, Monday to Friday)
- By letter to:

The Grid Link Project Manager,
EirGrid,
PO Box 12213,
Glenageary,
Co. Dublin,
Ireland.

2 INTRODUCTION, BACKGROUND AND CONTEXT

2.1 PURPOSE OF THIS REPORT

This Stage 1 Constraints Report has been prepared by RPS Group on behalf of EirGrid. The purpose of this report is to map and record all relevant constraints within the study area in advance of identifying potential corridors for the proposed Grid Link Project. The data collection is focused on determining what constraints exist that could influence the project.

In the context of this report, a constraint can be described as any physical, technical, legal, environmental, topographical or other consideration that may potentially affect, limit, restrict or confine the location or other aspect of the project, within the study area. This broad description of “constraint” thereby incorporates two strands: it includes factors which could comprise potential obstacles in the identification of substation locations, route corridors and line routes, and might best be avoided where possible or appropriate; it also includes considerations which will assist in defining the final nature of the project. Constraints as defined above are identified to ensure a comprehensive understanding of the study area.

Constraints are mapped to facilitate the identification of corridors. In line with EirGrid’s Roadmap and their *Approach to the Development of Electricity Transmission Lines*, Stage 1 is the main information-gathering phase of the assessment process and information gathered at this time provides a baseline which can be further developed at corridor identification stage and beyond. In line with EirGrid’s *Approach to the Development of Electricity Transmission Lines*, the focus at this stage is:

“...primarily on gathering environmental, social, technical and other information to inform and shape the project.”

This stage does not involve making binding decisions regarding the detailed nature, extent and location of the project, but simply gathering as much information as possible to ensure a balanced and robust outcome later in the process.”

In order to achieve a full understanding of the study area, a comprehensive body of data has been collated, some of which will only become relevant at later stages in the process but all of which is important in building up a picture of the study area and all of which ultimately contributes to making an informed decision on how the project will develop.

The report identifies a number of constraints as being of primary importance for the corridor identification for the Grid Link Project. It also considers other issues more broadly e.g. planning and legal considerations, technical considerations, and land use, which although not considered an obstacle for the purposes of corridor identification, potentially comprise issues for the later stages of route identification and environmental impact assessment, as per the Roadmap. Such considerations will be dealt with at the appropriate stage of the project development. This is not to suggest that these other issues are unimportant, rather that there are some issues that are of greater significance to the overall development of the project at the corridor identification stage.

This report records the collection of data to the end of July 2012. To ensure decisions are being made on the most up to date information, there will be confirmation of the status of datasets used in this report during each stage of the Roadmap as presented in **Figure 2.1**.

It is intended that the information contained within the report will enable meaningful consultation between the project team and all interested parties including members of the public, statutory consultees and key stakeholders in relation to the proposed Grid Link Project.

2.2 TERMS OF REFERENCE FOR THE GRID LINK PROJECT

The terms of reference (ToR) for the Grid Link Project have been set by EirGrid i.e. a 400 kV High Voltage Alternating Current (HVAC) circuit linking the transmission sub-stations at Dunstown in Co. Kildare to Knockraha in Co. Cork via Great Island in Co. Wexford. EirGrid will undertake reviews of its technical assumptions concerning the required nature and extent of the development during the lifecycle of the Grid Link Project to make sure they remain valid.

This provides the principal ToR for the Grid Link Project. In addition, a number of other documents also inform the ToR for the design of the project. These include the Grid25 Implementation Programme 2011-2016 and associated Strategic Environmental Assessment (SEA), Natura Impact Statement and Strategic Environmental Constraints Mapping and technical specifications, and guidelines in relation to overhead line (OHL), structures and station design from EirGrid.

2.3 KEY STAGES IN DEVELOPING THE GRID LINK PROJECT

The EirGrid approach to planning for high voltage overhead power line projects follows a structured framework of project development that provides a clear and transparent process to all stakeholders. It is based on five stages in the EirGrid Project Development Roadmap and these are presented below. **Figure 2.1** depicts the various stages in the EirGrid Roadmap process at each stage of the Roadmap. The project is currently at Stage 1. Further details can be found in the EirGrid publication: *Approach to Development of Electricity Transmission Lines* (www.eirgrid.com).

- **Stage 1 Information Gathering**

A draft study area was developed in March 2012 and went on public display from April 12th to June 8th 2012. Taking into account the submissions made during the consultation period, the final study area has been developed (see **Chapter 4**). Physical, environmental, topographical and other relevant constraints (e.g. legal requirements of the EIA, Habitat and Birds Directives) have been identified and mapped and these will form the basis of the next public consultation phase. The constraints mapping will then be used together with professional judgement to identify technically feasible corridors in which the proposed project could potentially be accommodated while avoiding significant strategic constraints to the greatest extent possible. **Chapter 3** of this Constraints Report provides an overview of the approach adopted for identification of constraints.

- **Stage 2 Evaluate Options**

This stage includes consideration of all feedback from Stage 1. Technically feasible corridors will be evaluated against each other based on *inter alia* technical, environmental, (including social) and cost criteria before identification of a preferred corridor / site and indicative line within the corridor. At this stage the initial process of landowner identification and engagement, and on-site survey will also commence.

- **Stage 3 Confirm Design**

This Confirm Design stage includes the statutory assessment of the preliminary design for the Grid Link Project. Specialists in a range of areas including ecology, landscape, EMF and noise will undertake desk and field based assessments of proposals in line with current best practice and with reference to national and EU guidance on EIA. Field surveys will continue to be undertaken to assist in confirming the final alignment and landowner discussions will be on-going throughout this stage. The output of the Confirm Design Stage is an Environmental Impact Statement (EIS).

- **Stage 4 Prepare Planning Application**

A Planning Application will be prepared for submission to An Bord Pleanála for determination. An Oral Hearing may be called at this stage.

- **Stage 5 Wayleave and Construction**

Construction plans will be prepared, landowners will receive wayleave notices and will be contacted to discuss construction and to agree access.

2.4 STUDY TEAM

The Grid Link study team comprises **EirGrid** as the client and overall Project Developers together with its consultants **RPS Group** (Engineering, Planning, Communications and Environment Consultancy – www.rpsgroup.com), **BPI** (Power System Planning and Design Consultancy - www.bpienergy.com) and **LSTC** (Survey Design and Engineering Consultancy - www.lstc.co.uk). The team represents the key disciplines for the project as follows:

- Environmental Assessment – RPS
- Planning Process – RPS
- Stakeholder Engagement – RPS
- Technical Engineering Grid Design – LSTC
- Technical Engineering Station Design – BPI

Identification of constraints has been carried out by RPS, LSTC and BPI through consideration of relevant environmental, planning and technical issues.



Project Development & Consultation Road Map

You are Here



You are Here

Figure 2.1: Stages in EirGrid's Roadmap

3 APPROACH TO IDENTIFICATION OF CONSTRAINTS

This Chapter presents the approach used to identify and map the relevant constraints for the Grid Link Project. At the constraints stage, given the size of the study area, the focus has principally been of a European, national and regional significance and based on desktop information. As the project progresses a greater level of detail will be sought and obtained, and therefore the focus of the assessment will move to regional and local level data sets (including site visits and field surveys) depending on the location of corridors and ultimately the proposed alignment for the Grid Link Project.

3.1 CONFIRMATION OF THE STUDY AREA

The first step in the Constraints Study is the confirmation of the study area. Based on feedback from the first consultation period, the study area has been reviewed and a final project study area has been established. It is within this area that constraints have been identified. Further details of the consultation and implications for the study area are presented in **Chapter 4** and also in the *Report on Consultation No. 1 2012* (under separate cover). The project study area is shown in **Figure 4.1**.

3.2 DATA GATHERING AND IDENTIFICATION OF CONSTRAINTS

The next step of the Constraints Study comprises data gathering. This has been primarily a desk based exercise utilising readily available information. Details of the information sources used in the desk top assessment are summarised in **Appendix B** and detailed in the relevant sections of **Chapters 6-8** of this report.

The principal categories of constraints investigated for the Grid Link Project were:

- Planning and Legal (refer to **Chapter 6**);
- Technical (refer to **Chapter 7**); and
- Environmental (including social, refer to **Chapter 8**).

3.3 CONSULTATION

Full details of the consultation undertaken for Stage 1 of the Grid Link Project can be found in the separate *Consultation Report No 1* (EirGrid, 2012) and summary details are provided in **Chapter 5**.

3.4 MAPPING OF CONSTRAINTS

The establishment of the constraints mapping has been facilitated through the use of a Geographic Information System (GIS). A comprehensive GIS Database (ESRI File GeoDatabase) was developed and populated with the individual constraints layers and the background data received. Specialised modules of the ArcGIS software were used for spatial analysis such as deriving slope and elevation. The main output from the Database is a series of maps which spatially represent constraints within the study area.

This methodology has permitted multiple layers of environmental data to be built up to compile composite maps which will facilitate the identification of feasible route corridors as set out in EirGrid's Roadmap. In the context of this project, a feasible route corridor refers to an identified corridor within which a technically feasible overhead transmission line could potentially be routed which meets the

objectives and technical needs of the project, which avoids or minimises significant environmental impacts, and which meets standard engineering and construction requirements.

3.5 PREPARATION OF CONSTRAINTS REPORT

Following completion of the desktop assessment and mapping exercise the study team have documented the key findings in the following Chapters:

Chapter 6 outlines the planning and development framework associated with the proposed project;

Chapter 7 provides an overview of the technical issues associated with the project including reference to sub-stations, overhead lines, topography and construction;

Chapter 8 presents a summary of the main environmental data sets referenced; (2) environmental constraints (and where relevant, opportunities) within the study area; and (3) mapping that shows the location and extent of these constraints; and

Chapter 9 provides an overview of the next steps.

Using the constraints mapping and professional judgement, potential corridors in which the development can occur will be identified in the next stage. Following evaluation of these corridors (against criteria yet to be defined) a least constrained corridor for the overhead line and/or associated infrastructure will be identified.

3.6 INFORMATION SOURCES USED

A wide variety of data and information sources were used in the preparation of this report. In general these included:

- Relevant papers, electronic or web based data obtained from various agencies e.g. databases such as the EPA's environmental mapping system ENVision, the GIS databases compiled as part of implementation of the Water Framework Directive and the National Parks and Wildlife Service database.
- Data and information obtained through consultations with local authorities and regulatory agencies; and
- Data and information obtained through consultations with the public by means of public information centres and open days.

Appendix B includes a list of the principal data sources used to develop constraints mapping and the Constraints Report for the Grid Link study area. Where local level constraints have been identified in written and / or verbal submissions to the project team, these will be mapped as far as possible and referenced as appropriate during future stages of the process.

It is key that the current state of the environment is described using the most recent and up-to-date environmental data, information and reports. Where updates of significant environmental data and associated reports become available during the various stages of the project, this data will be incorporated into the project and treated appropriately.

3.7 DATA CHALLENGES

Where data gaps have been found for particular aspects of the environment, the significance of these data gaps has been clearly stated. In addition, it will be stated whether these gaps can be reasonably and realistically addressed during the course of the project.

The following difficulties were encountered during development of the constraints mapping:

There is currently no **national landscape mapping** in Ireland. This Constraints Report has, where possible, sourced landscape information directly for each of the local authorities within the study area. For the purposes of the Constraints Report, Protected Areas, Scenic Routes, Views and Prospects have been mapped where possible. To supplement the local authority data, the visual sensitivity land-use map prepared as part of EirGrid's *Environmental Constraints Mapping*¹ for Grid25 (see **Section 4.2** below) has also been reviewed. This was compiled based on Corine (Coordination of Information on the Environment) land cover characteristics that are likely to be indicative of conditions that will provide high visual vulnerability.

The latest available **Corine** land cover dataset to 2006 has been used. Aerial photography has been used to supplement this dataset. The most recent aerial photography available dates to 2011 and covers the node points at Knockraha, Great Island and Dunstown.

Spatial data and mapping relating to the **Record of Protected Structures (RPS)** are not available for all counties within the study area. While an RPS list is provided in County Development Plans in some cases the national grid references are not provided. Many of the structures listed in the various development plans are also listed on the National Inventory of Architectural Heritage for which spatial data is available, however not all entries to the RPS lists are included in the NIAH. All RPS and NIAH digital data available has been mapped for the Constraints Report and any without spatial data have been recorded throughout the text. These will be verified by field survey as appropriate.

No spatial data was available for the **Architectural Conservation Areas (ACAs)** within the study area therefore these have not been mapped, however they are referenced in the text. The ACA will be verified by field survey as appropriate.

Only point (site location) data is available for **Gate 2 and Gate 3**² windfarms which have not yet progressed through planning, i.e. site boundaries and location of the turbines for each offer are not yet available and only single reference point locations are available. For the purposes of the Constraints Report the point data is considered sufficient. For those windfarms that have entered into planning, the site information is actively being sought from the relevant local authorities and will be included as part of the constraints mapping as soon as available.

¹ EirGrid Strategic Environmental Constraints Mapping, 2011 (www.EirGrid.com)

² Since December 2004, renewable generators wishing to connect to the transmission or distribution systems have been subject to connection application group processing through a series of successive "Gates". The Gate 2 decision was finalised by CER in June 2006 for over 1300 MW of wind generation and the criteria for Gate 3 was finalised by CER in December 2008 for approximately 4000MW of wind generation.

4 WORK TO DATE

4.1 IDENTIFICATION OF STUDY AREA

In the first quarter of 2012, the *proposed study area* was developed for the Grid Link Project. The purpose of defining a study area at this early stage is to facilitate the identification of key constraints within that study area [the subject of this report]. This is a precursor to development of feasible corridor options and a systematic assessment of these options leading to the selection of a solution, which will form the basis for the detailed design to follow. **Figure 4.1** shows the *project study area* within which constraints have been identified for this report.

The *proposed study area* for the Grid Link Project underwent public consultation between 12th April and 8th June 2012 during which time comments were principally sought on the following issues:

- Extent of the study area;
- Identification of constraints; and
- The corridor development process.

At this time no route has been developed for the Grid Link Project. The general principle used to define the location and extent of the *proposed study area* was that it should be large enough to capture the following:

- The strategic objectives of the project;
- A range of technical options; and
- Three specified sub-station connection points (Knockraha, Dunstown and Great Island).

A process will follow the constraints reporting and mapping and it is likely a number of corridors will be identified throughout the study area which capture the requirements.

A number of comments were made regarding the size and nature of the study area during the first consultation. The comments fell into two main categories, firstly that the study area was too large and why so many counties were included and secondly that it was too restrictive and did not include for the possibility of offshore to be taken into account.

Based on the issues raised at the first public consultation, it is not proposed to alter the study area boundary at this time. The Grid Link team has reviewed the submissions and determined that there would be no value in reducing the size of the study area at this stage in order to ensure that every opportunity is afforded to the technical team to develop an appropriate least constrained corridor and route alignment for the development. The boundary will be kept under review as further information is gathered in future stages of the project.

The Study Area Paper can be found at <http://www.eirgridprojects.com/projects/gridlink/>.

4.2 GRID25 IMPLEMENTATION PROGRAMME STRATEGIC ENVIRONMENTAL ASSESSMENT AND STRATEGIC ENVIRONMENTAL CONSTRAINTS MAPPING

The Grid25 Implementation Programme (IP) 2011-2016 sets out a practical overview of the early stages of the Grid25 strategy for major investment in the transmission grid in order to meet the long term needs of the country; the Grid25 strategy (and the IP) is consistent with the Government's renewable generation target of having 40% of electricity generated from renewable resources by 2020. This IP underwent Strategic Environmental Assessment (SEA) in order to anticipate and avoid adverse impacts arising and to provide a clear understanding of the likely environmental consequences of decisions arising from the Grid25 IP.

As part of this process, Strategic Environmental Constraints Mapping was also prepared by EirGrid in order to provide relevant information on environmental constraints so that environmental issues could be taken into consideration from the earliest possible stages of strategic transmission reinforcement.

For the purpose of the Grid25 IP SEA the country was divided into 3 Sectors (taking into consideration combinations of the regions defined in the National Spatial Strategy (NSS));

- Sector 1 The Border and West Regions;
- Sector 2 The Midland, Mid East, South East and Greater Dublin Regions; and
- Sector 3 The Mid West and South West Regions.

The Grid Link study area is primarily contained within Sector 2 with small sections of Sector 3 also relevant (**Figure 4.2**)

This existing high level strategic constraints mapping has formed the starting point for the current work on constraints for the Grid Link Project. All further and relevant datasets have been included to complement strategic constraints mapping to meet the needs of the project. The datasets will be checked for updates throughout the Grid Link Project process and, as a minimum, in advance of publication of reports arising out of **Stages 1 to 5** of EirGrid's Roadmap as outlined in **Figure 2.1** and **Section 2.3**

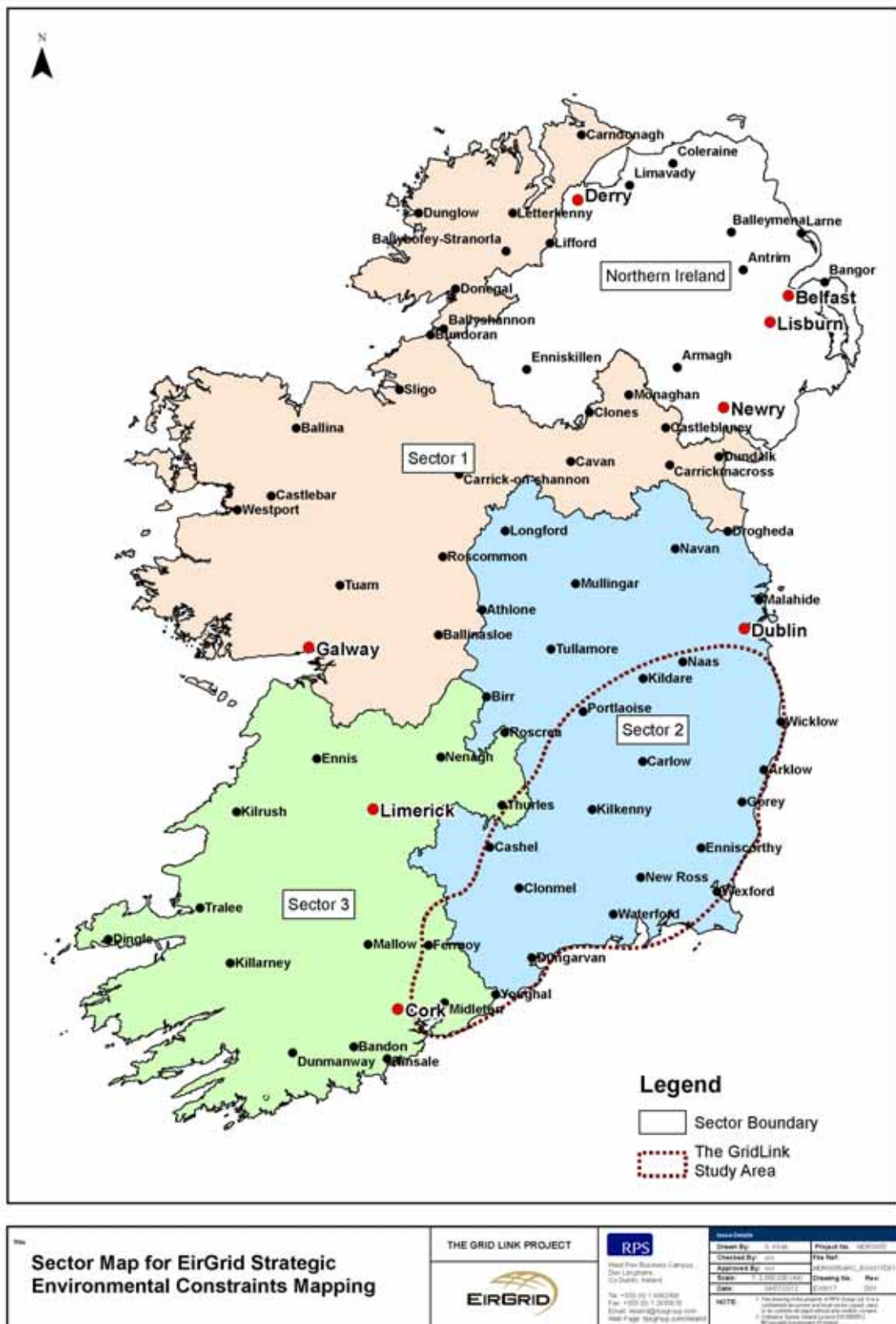


Figure 4.2: Sector Map for EirGrid Strategic Environmental Constraints Mapping

5 PUBLIC CONSULTATION AND KEY ISSUES RAISED

A comprehensive stakeholder engagement strategy has been put in place for the Grid Link Project. This includes Open Days, Information Offices, Project Website and face to face meetings with stakeholders. Details of this stakeholder engagement strategy can be found in a separate report, *Report on Consultation No.1* (August 2012), prepared by RPS on behalf of EirGrid.

5.1 KEY THEMES RAISED DURING PUBLIC CONSULTATION

A wide range of issues were raised by participants in this consultation. For the purposes of this report the issues have been grouped into themes having regard to the layout and approach taken in the *Report on Consultation No. 1* referred to above. These themes comprise the following:

- Proposed Study Area
- Agriculture and Bloodstock;
- Archaeology, Architecture and Cultural Heritage;
- Biodiversity and Ecology;
- Community;
- Existing or planned infrastructure;
- Landscape and Visual Impacts;
- Strategic Constraints;
- Water;
- Terrain; and
- Tourism.
- Developing Corridors;
- Communications and Public Consultation;
- Other Issues:
 - Project Need;
 - Cumulative Impacts; and
 - Issues with Existing Electricity Infrastructure.

5.2 ENVIRONMENTAL STAKEHOLDERS

In order to gather the relevant information for the constraints mapping and reporting, a list of key environmental stakeholders was developed and these were contacted as part of the wider consultation for the project. The study team issued letters to each of these environmental stakeholders, as shown below in **Table 5.1**.

Table 5.1: Key Environmental Stakeholders

Environmental Stakeholders		
An Garda Síochána	Eircom	National Monuments Service (DAHG)
An Taisce	Environmental Protection Agency	National Parks and Wildlife Service
Badgerwatch	Fáilte Ireland, Environment Unit	National Roads Authority
Bat Conservation Ireland	Forest Service, Department of Agriculture, Food and Marine	National Transport Authority
Birdwatch Ireland	Friends of the Irish Environment	Native Woodland Trust
Board Iascaigh Mhara	Geological Survey of Ireland	Office of Public Works
Bord Gáis Networks	Health Service Executive	Planning System and Spatial Policy Section (DoECLG)
Bord Na Móna	Heritage Council	Port of Waterford
Built Heritage and Architectural Policy (DAHG)	Ianród Éireann	Railway Procurement Agency
Bus Éireann	IDA	Railway Safety Commission
Coastwatch Ireland	Industrial Heritage Association of Ireland	Road Safety Authority
Coillte	Inland Fisheries Ireland	RTE Head Office
Commission Energy Regulation	Irish Aviation Authority	RTE Networks
Crann	Irish Business and Employers' Confederation	Sherkin Island Marine Station
Department of Agriculture Food and Marine	Irish Farmers Association	South Eastern River Basin District
Department of Arts, Heritage and Gaeltacht Affairs	Irish Landmark Trust	South East Regional Authority
Department of Communications, Energy and Natural Resources	Irish Mountaineering Association	South Western River Basin District
Department of Defence	Irish Peatland Conservation Council	South West Regional Authority

Environmental Stakeholders		
Department of Environment Community and Local Government	Irish Rail	Sustainable Energy Authority of Ireland
Department of Health	Irish Sports Council	Sustainable Water Network
Department of Transport, Tourism and Sport	Irish Whale and Dolphin Group	Teagasc
Development Applications Unit (Part of the DAHG)	Irish Wildlife Trust	Tree Council of Ireland
Dublin Naturalists Field Club	Irish Wind Energy Association	Walkers Association of Ireland
Dublin and Mid-East Regional Authority	Local authorities within the Study Area	Waterways Ireland
ECO UNESCO	Met Éireann	
Eastern River Basin District	Midlands Regional Authority	

Meetings were held with a number of the environmental stakeholders in order to discuss constraints and best practice opportunities which might inform the development of the Grid Link Project. For further information on meetings with stakeholders which took place during Consultation No. 1 please see the separate Consultation report. The environmental stakeholder meetings which took place are outlined below:

- NPWS staff on 31/05/2012;
- DAHG Heritage Unit 31/05/12;
- NPWS staff 18/06/2012; and
- NRA 02/08/12.

6 PLANNING, PROCEDURAL AND LEGAL CONSIDERATIONS

6.1 REGULATORY FRAMEWORK

As noted at **Section 2.1** of this report, planning, procedural and legal considerations are issues which although not considered an obstacle for the purposes of corridor identification, potentially comprise issues for the later stages of route identification and environmental impact assessment, and therefore require to be understood at an early stage of project development.

There is a comprehensive body of planning and environmental legislation and guidance which will inform the Grid Link Project as it progresses through the planning process. The principal planning framework relates to Strategic Infrastructure Development and the principal environmental framework relates to Environmental Impact Assessment.

6.1.1 Strategic Infrastructure Development

The primary legislation governing planning and development in Ireland is the Planning & Development Act 2000 ('PDA'), as amended by various subsequent acts. The Planning and Development (Strategic Infrastructure) Act 2006 introduced a new planning regime to streamline the planning process for major infrastructure projects. Certain developments of strategic importance to the state or regions can apply for permission / consent directly to An Bord Pleanála rather than submitting a planning application to the local authority in the first instance.

Specific Strategic Infrastructure Development (SID) procedures are provided in the PDA, as amended, for the approval of development by state authorities as well as the development by other undertakers of strategic electricity and gas infrastructure. Specifically under Section 182A of the PDA, as amended, where a person (the "undertaker") intends to carry out a *'development comprising or for the purposes of electricity transmission'*, the undertaker shall prepare, or cause to be prepared, an application, an EIS (where appropriate) and/or Natura Impact Statement to be submitted to An Bord Pleanála for Approval of the development. This now constitutes the necessary consent procedure for strategic infrastructure in Ireland. The Planning and Development (Strategic Infrastructure) Act 2006 clarifies that *"transmission"* shall be construed as meaning the transport of electricity by means of (a) a high voltage line where the voltage would be 110 kilovolts or more, or (b) an interconnector, whether ownership of the interconnector will be vested in the undertaker or not.

Having regard to the above, it is EirGrid's current consideration that the Grid Link Project falls within the scope of Section 182A of the Planning and Development Act, as amended, being for the purposes of the transmission of electricity by means of a 400 kV circuit. However, a decision in this matter rests ultimately with An Bord Pleanála, following a process of pre-application consultation with EirGrid (yet to be commenced). However, assuming the project is deemed to be SID, in due course, an application for statutory approval for the construction of the Grid Link Project will be submitted directly to An Bord Pleanála. The Roadmap for the Grid Link Project anticipates an application for approval will be submitted during 2015.

Although An Bord Pleanála is the SID decision making body, for strategic infrastructure development, the policies and zoning objectives that provide a local policy context for a specific project remains the responsibility of the relevant planning authority / authorities.

6.1.2 Environmental Impact Assessment (EIA)

The Environmental Impact Assessment process is governed by the EIA Directive (EU Directive 85/337/EEC as amended), which has been adopted into Irish legislation principally via the Planning and Development Act and Planning and Development Regulations, as respectively amended.

An EIA will be required for any development that falls within Schedule 5 of the Planning and Development Regulations, as amended. In relation to electricity transmission. Part 1 of Schedule 5 requires an EIA for the *construction of overhead electrical power lines with a voltage of 220 kilovolts or more and a length of more than 15 kilometres*. In this regard, it is currently assumed that the Grid Link Project will require formal EIA and an Environmental Impact Statement will be required as part of the statutory approval process.

6.1.3 Other Relevant Environmental Legislation

In addition to the legislation and guidance mentioned above, there is a body of other environmental legislation which will have implications for the Grid Link Project. At this stage in the project, the most relevant relate to strategic EU Directives which have been transposed into Irish law and some of the most relevant of these are listed below and explored in **Sections 8.6 and 8.7**. It is noted that this is not intended to be a detailed legislative review but it does serve to highlight legislative constraints which may impose restrictions on how the Grid Link Project progresses. As more details of the project are developed, more targeted legislative reviews will be possible.

Other relevant environmental legislation includes:

- Birds Directive;
- Habitats Directive;
- Water Framework Directive;
- Drinking Water Directive;
- Bathing Water Directive;
- Shellfish Waters Directive; and
- Floods Directive.

6.2 STRATEGIC POLICY CONTEXT

Electricity infrastructure must be considered in the context of European, national, regional and local planning policy. A “Strategic Planning Context Report” will be prepared at a later stage in the project. It will review the strategic policy context for the Grid Link Project and will address:

- The **strategic context** for energy infrastructure in Ireland as set out in a number of national development plans and policy documents;
- The **Regional Planning Guidelines** which provide long term strategic objectives aimed to direct future growth and implement the planning framework set out in the NSS to the regional level. The study area extends into 4 regional authority areas which include the South East, Mid West, South West, and Greater Dublin Area (Mid East and Dublin); and
- **Local planning policy** which is primarily set out in County Development Plans and Local Area Plans and these have an important role in the facilitation of strategic infrastructure such as high voltage transmission lines. The relevant county and town development plans are included in **Appendix C**.

7 TECHNICAL CONSIDERATIONS

The technical considerations which will be taken into account during the identification of the corridor options are outlined below.

7.1 SUB-STATIONS

At Dunstown, a 400 kV sub-station is already established, this station connects the 400 kV circuit from Moneypoint which has been in operation since the mid 1980s. The connection of the additional 400 kV line will require relatively minor additional infrastructural modifications to the existing station. The sub-stations at Knockraha and Great Island currently have 220 kV and 110 kV facilities. Therefore, it will be necessary to establish new 400 kV sub-stations with the associated plant and equipment to connect into the existing infrastructure.

The main technical considerations relevant to the development of a solution for the sub-stations at Great Island and Knockraha are outlined below:

- **Connection to 400 kV lines:** The sub-station position and orientation must be compatible with the proposed Grid Link 400 kV overhead line. If possible, the 400 kV station should be located such that the 400 kV line approaches the sub-station without crossing any of the existing 220 kV lines;
- **Connection to existing 220 kV sub-stations:** The 400 kV sub-station at each location for the Grid Link Project is to be connected to the existing 220 kV sub-stations at Knockraha, Great Island and Dunstown.
- **Ground Area:** The land area required for a sub-station depends on the type of switchgear to be installed. Gas Insulated Switchgear (GIS) requires less space for the switchgear than Air Insulated Switchgear (AIS);
- **Topography:** The site must not be liable to flooding or crossed by significant water courses. It should also be unencumbered by existing constructions which cannot be dismantled. It is preferable to avoid prominent and exposed positions where appropriate and be reasonably level;
- **Ground Suitability:** The ground must be suitable to meet technical standards with regard to earthing requirements;
- **Access for Construction:** Building the sub-station requires heavy construction plant as well as large and heavy electrical equipment. Therefore it must be possible to construct an adequate access track from a suitable roadway;
- **Operational Access:** 24 hour access is required for cars and vans and rarely for larger loads; and
- **Extendibility:** The position and orientation of the sub-station should not prohibit developments which may be required in the future.

7.2 OVERHEAD LINE CORRIDOR

General technical considerations which will be considered at corridor identification stage have been identified in relation to the following categories:

- Existing infrastructure;
- Topography and land features; and
- Construction.

Further technical limitations regarding the engineering specification and construction of the line will primarily affect the alignment identification within the corridor that emerges as least constrained, however some limitations will affect the initial corridor identification itself and thus these items are identified below.

7.2.1 Technical Limitations

General technical limitations associated with OHL structure design and corresponding conductor options are detailed below. At this stage, EirGrid's existing standard 400 kV structure designs and the existing EirGrid 400 kV Functional Specification are the standards which the alignment route and structure positioning will be based upon. Further consideration of alternatives will take place at the relevant stages of the project.

- **Span length:** The maximum achievable span length will be in accordance with the current EirGrid OHL structure designs and specifications. The span length that can be achieved will determine the feasibility of crossing elements such as open expanses of water for example.
- **Angles of deviation:** The maximum achievable angle of deviation will be in accordance with the current EirGrid OHL structure designs and specifications. Once the OHL structures to be used have been confirmed, the maximum achievable angle of deviation will be known: this will determine whether it is feasible to route the OHL around elements using extreme angles or not.
- **Slope:** Where a slope is greater than the maximum gradient catered for by the current EirGrid specifications, this may restrict where the alignment can be routed.
- **Crossing angles:** Crossing angles of existing 110 kV and 220 kV lines will be in accordance with the EirGrid Functional Specification.

7.2.2 Existing and Proposed Infrastructure

Existing infrastructure is a primary consideration. Any future planned infrastructure developments (of which details are available within the public domain) will be considered on the basis that 'approved' developments may have been completed prior to the installation of the Grid Link proposed 400 kV line.

Existing and proposed infrastructure is a consideration which must be identified in relation to the technical aspects of a scheme. **Table 7.1** below outlines the infrastructure factors that will be considered and identified. Further detail on infrastructure is provided in **Sections 8.4** and **Figure 8.4 1 - 8.4.2** which were considered under the environmental constraints section of the report.

Table 7.1: Existing and Proposed Infrastructure Considerations

What is the Issue?	How is this Addressed in the Constraints Report and Mapping
<p>Roads:</p> <p>OHL's cannot be routed on roads. Minimum horizontal distances from OHL's to roads are required in order to comply with EirGrid's design standards. Crossing of roads, particularly, motorways, present construction and maintenance considerations and these must be crossed in a manner that fulfills EirGrid's specification (i.e. achieve minimal horizontal and vertical distances and cross at an acceptable angle).</p>	<p>Motorways, national and regional roads, as represented on OSI mapping have been identified on the constraints mapping.</p>
<p>Rail:</p> <p>OHL's cannot be routed on rail lines. Minimum horizontal distances from OHL's to rail lines are required to comply with EirGrid's design standards. Crossing of railways presents construction and maintenance considerations and must be crossed in a manner that fulfills EirGrid's specification (i.e. achieve minimal vertical distances and cross at an acceptable angle).</p>	<p>Electrified and non-electrified railway lines (and disused railway lines where known) have been identified on the constraints mapping.</p>
<p>Overhead Power Lines (transmission):</p> <p>The presence of high voltage lines (110 kV, 220 kV and 400 kV) in particular can affect the route of another OHL: for example, where crossing of lines would be required or where diversion of an existing line might be necessary to facilitate a new line.</p>	<p>The existing transmission network has been identified on the constraints mapping.</p>
<p>Underground Services:</p> <p>The presence of cable routes, major water mains, high pressure gas pipelines and oil pipelines can limit/affect the routing of a new OHL. Minimum clearance distances (horizontal, and/or limits to the length at which you can run parallel to the line) may be required for installation, operational and maintenance, safety and supply security purposes.</p>	<p>Major gas and oil pipelines and watermains have been identified on the constraints mapping where known.</p>
<p>Airports and Airfields:</p> <p>Exclusions and height restrictions in place around airports and airfields must be observed. These exclusion zones and height limits are directly relevant to the identification of reasonable corridors for the Grid Link project.</p>	<p>The location of airports and airfields has been obtained from the Irish Aviation Authority and these have been identified on the constraints mapping, along with exclusion zones where known.</p>
<p>Military Land:</p> <p>Exclusions and restrictions on military land, especially firing ranges are important considerations for routing OHL transmission lines.</p>	<p>A confirmed dataset of military land could not be obtained and such lands have not been mapped however, the location of key areas such as the Glen of Imaal is generally known.</p>
<p>Wind farms:</p> <p>A minimum separation distance (as specified by EirGrid) between the new OHL and the turbine structures must be observed.</p>	<p>Existing windfarm sites have been mapped. Known proposed windfarm sites have also been mapped, however such sites are often only defined by a single indicated point which does not represent the full extent of the future site.</p>
<p>Proximity to Buildings and Other Structures:</p> <p>An OHL must be a minimum distance (depending on OHL structure design and voltage) from buildings and</p>	<p>Major population centres (cities, major towns and small towns) have been identified on the constraints mapping as has population density within the study area.</p>

What is the Issue?	How is this Addressed in the Constraints Report and Mapping
other structures in order to achieve technical and statutory clearances.	

7.2.3 Topography and Land Features

Topography and land features are also considerations which must be identified in relation to the technical aspects of a scheme. **Table 7.2** below outlines the topography and land features that will be considered and identified. Further details on soils and geology and water are provided in **Sections 8.5 and 8.7** which were considered under the environmental constraints section of the report.

Table 7.2: Topography and Land Feature Considerations

What is the Issue?	How is this Addressed in the Constraints Report and Mapping
<p>Poor Ground Conditions:</p> <p>Can affect where OHL structures can be located. Poor ground conditions are likely to result in the need for special piled or enlarged/ reinforced foundation structures which may in turn require the construction of special access roads for heavy plant to access the structure / site location.</p>	<p>Peat landslide susceptibility is identified on constraints mapping.</p>
<p>Steep Slopes/ Valleys (Land Gradient) And Hill Ridges:</p> <p>Can affect where OHL structures can be located: may result in the need for special/ reinforced foundation structures and removal of ground where a slope is greater than the maximum gradient catered for by the OHL structure design. In addition, steep gradients may pose access and construction issues.</p>	<p>Slopes of greater than 30° are identified on constraints mapping.</p>
<p>Slope Stability:</p> <p>Can affect where OHL structures can be located: may result in the need for special/ reinforced foundations.</p>	<p>Slope stability has not been mapped at this stage: mapping such constraint would require surveys across the extensive study area.</p>
<p>Geology, Including Fault Lines, Hydrology and Hydrogeology:</p> <p>Can affect where OHL structures can be located: may result in the need for special/ reinforced foundation structures or structure movement.</p>	<p>Have not been mapped at this stage, being structure specific as oppose to corridor specific.</p>
<p>Quarries and Mines:</p> <p>An OHL should not be routed across quarry or mining land due to the nature of the ground and the works that are undertaken on such sites.</p>	<p>Registered quarry and mining sites have been identified on the constraint mapping.</p>
<p>Landfill Sites:</p> <p>An OHL should not be constructed on landfill sites due to the health, safety and environment implications involved in construction on such sites.</p>	<p>Registered landfill sites have been identified on the constraint mapping.</p>
<p>Waterways / Waterbodies</p> <p>When crossing waterways / waterbodies, a minimum clearance to the water must be achieved (variable</p>	<p>See Section 8.7 Water.</p>

What is the Issue?	How is this Addressed in the Constraints Report and Mapping
depending on whether the waterway is navigable). This may also present issues for span length.	
<p>Forestry:</p> <p>An OHL can be routed amongst forestry providing that a swathe of forestry is felled to provide a clear strip that meets the minimum falling distance and EirGrid specification requirements. Likewise, an OHL can be routed alongside forestry provided that minimum clearance are achieved. Some forests have poor ground conditions, thus the issues associated with this (as outlined above) may be applicable.</p>	Forestry is identified on constraints mapping.

7.2.4 Construction

Table 7.3 outlines the construction factors that will be considered and identified at this early stage.

Table 7.3: Construction Considerations

What is the Issue?	How is this Addressed in the Constraints Report and Mapping
<p>Access for construction and maintenance to individual OHL structures:</p> <p>The presence of existing access opportunities and the potential to create new accesses routes will affect the installation planning and maintenance of the OHL.</p>	This issue can only be addressed at a very high level until locations / line is confirmed at a later stage in the project. For the constraints stage motorways, national and regional roads as per table 7.2) have been mapped
<p>Altitude for Construction:</p> <p>Topography at altitude generally becomes more complex, undulating and difficult terrain. This presents technical design, construction and access issues.</p>	Altitudes of 200m and more are identified on constraints mapping.

8 ENVIRONMENTAL CONSIDERATIONS

This chapter of the report deals with the environmental considerations in relation to the project. The environment typically includes reference to: Human Beings; Natural Environment; Built Environment; and Material Assets. Environmental considerations can broadly be separated into Manmade and Natural as follows:

MANMADE:

- Population and Settlement;
- Cultural Heritage
- Land Use; and
- Infrastructure and Utilities.

NATURAL:

- Soils & Geology;
- Biodiversity;
- Water; and
- Landscape & Visual.

These considerations are addressed in the following sections of **Chapter 8** and in **Appendix A**.

As a starting point for environmental information gathering, the SEA for the Grid25 IP has been referenced and in particular the SEA Environmental Objectives. These objectives have been used to inform the information gathered at this stage. It is however noted that not all information gathered in the following sections is relevant at the corridor identification stage but will be used at the appropriate stage of the project and will be supplemented by local information as the project develops.

8.1 POPULATION AND SETTLEMENT PATTERNS

8.1.1 Objective

The SEA of the Grid25 IP does not identify specific objectives in relation to population and settlement patterns; however, it does include related considerations under the headings Population and Human Health and Material Assets and Soil. These objectives are:

- To minimise proximity of development to concentrations of population in order to reduce actual and perceived environmental effects; and
- To minimise effects upon the sustainable use of land, mineral resources or soils.

8.1.2 Scope

This section of the report identifies the population and settlement patterns that exist in the defined study area for the project. The study area includes all of counties Carlow, Waterford, Wexford and Wicklow, most of Kilkenny, and to a lesser extent Cork, Kildare, Laois and Tipperary. A small portion of County Limerick, South Dublin and Dun Laoghaire Rathdown are also included.

The material sources consulted as part of this desktop study are as follows:

- A review of the national settlement hierarchy included within the National Spatial Strategy 2002-2020 (NSS);
- A review of the settlement hierarchies as included in the relevant Regional Planning Guidelines for the Greater Dublin Area, Midlands, South West and South East Regions 2010-2022;
- An examination of Central Statistics Office data; and
- A review of Ordnance Survey maps.

8.1.3 What is the Issue?

The key issues associated with transmission lines and population and settlement patterns are outlined in **Table 8.1a**.

Table 8.1a: Key Issues Associated with Transmission Lines and Population and Settlement Patterns.

What is the Issue?	How is this Addressed in the Constraints Report and Mapping
<p>Settlements: Built up areas and areas with high population density pose significant challenges for identification of a reasonable OHL alignment due to the greater number of people that can be affected, particularly in relation to visual impact.</p>	<p>Major population centres (cities, major towns and small towns) have been identified on the constraints mapping as has population density within the study area.</p> <p>Geodirectory information has been considered but not mapped at this stage due to the current size of the study area.</p>

What is the Issue?	How is this Addressed in the Constraints Report and Mapping
<p>Amenity Effects:</p> <p>The presence of an OHL in the landscape has the potential to impact on residential, community and / or tourist amenity e.g. visual.</p>	<p>Major population centres (cities, major towns and small towns) have been identified on the constraints mapping as has population density within the study area.</p> <p>In addition amenity areas such as major tourist attractions, recreational beaches, rivers, cycling and walking routes, Natura 2000 sites, scenic routes and high amenity landscape areas etc. have been identified on the constraints mapping.</p>

8.1.4 Baseline Information

Key baseline information on Population and Settlement in the study area is presented in **Figure 8.1.3 (1-4)** at the end of this section and text describing baseline information can be found in **Appendix A**.

8.1.5 Key Considerations

Major settlements (e.g. cities, towns, villages, suburban and residential areas) represent a significant constraint within the study area. Along both the southern and eastern coastline (particularly scenic areas) there is also concentrated dispersed settlement patterns, which include *inter alia* holiday homes / accommodation (e.g. Wexford, Waterford and Cork coastlines).

Outside major settlements, there are also high levels of one-off and clustered rural housing and these will be an important consideration at detailed route alignment stage.

The study area may offer potential opportunities for transmission development outside built up areas. There are also opportunities for transmission development on non-natural land uses.

8.2 CULTURAL HERITAGE

8.2.1 Objective

The SEA of the Grid25 IP identified one key objective in relation to cultural heritage (comprising archaeology, architectural and cultural heritage) as follows: -

- To avoid unauthorised impacts upon archaeological heritage (including entries to the RMP) and architectural heritage (including entries to the RPSs).

This objective will influence the consideration of cultural heritage throughout each stage of this project. Cultural heritage includes architectural and archaeological heritage.

8.2.2 Scope

A desktop study was undertaken to identify the architecture, archaeology and cultural heritage. The material sources consulted as part of the desk study are as follows: -

- Record of Monuments and Places (www.archaeology.ie);
- National Monuments in State Care and Preservation Orders;
- Register of Historic Monuments;
- National Inventory of Architectural Heritage (NIAH);
- NIAH Historic Garden and Designed Landscape Survey; and
- Record of Protected Structures (RPS) and Architectural Conservation Areas (ACA) in County/Town Development Plans as set out in **Appendix C**.

8.2.3 What is the Issue?

The general approach to be taken to address the key cultural heritage issues associated with transmission lines are outlined below in **Table 8.2a**.

Table 8.2a: Key Issues Associated with Transmission Lines on Cultural Heritage

What is the Issue?	How is this Addressed in the Constraints Report and Mapping
<p>Impact on Recorded Archaeological Sites/monuments:</p> <p>There is a potential for a direct impact where an OHL structure or sub-station is placed on or adjacent to a recorded monument. Impacts on setting are also possible from OHL.</p>	<p>RMP sites have been identified on the constraints mapping. Consultation has taken place with National Monuments Service of the DAHG and all relevant local authorities.</p>
<p>Impact on National Monuments:</p> <p>Potential that the setting and visual amenity of a</p>	<p>Consideration has been given to monument complexes and landscapes through mapping of all National</p>

What is the Issue?	How is this Addressed in the Constraints Report and Mapping
National Monument may be impacted from OHL structures and sub-stations.	Monuments on the constraints mapping. Consultation has taken place with National Monuments Service of the DAHG and all relevant local authorities.
Candidate UNESCO World Heritage Sites: Potential that the setting and visual amenity of a Candidate UNESCO World Heritage Site will be compromised as a result of presence of OHL or sub-station.	Candidate UNESCO World Heritage Sites have been identified on the constraints mapping. Consultation has taken place with National Monuments Service of the DAHG and all relevant local authorities.
Impact on Potential Sub-surface Archaeological Sites: The RMP is not an exhaustive list of all archaeology therefore the construction of OHL structures and sub-stations has the potential to reveal previously unknown archaeological remains even in areas where an archaeological potential is not identified.	Cannot be mapped. However, the emerging archaeological potential of any given area has been considered at the constraints stage. Consultation has taken place with National Monuments Service of the DAHG and all relevant local authorities.
Impact on Protected Structures and NIAH Sites of Regional and Above Rating: OHL structures within the curtilage or attendant grounds would have a direct/indirect impact on the property and character of protected structures.	Protected Structures and records from the NIAH have been identified on the constraints mappings. Consultation has taken place with the Architectural Heritage Advisory Unit and the National Inventory Architectural Heritage for buildings and garden surveys and all relevant local authorities.
Impact on Demesne Landscapes / Garden Landscapes: OHL structures within the curtilage or attendant grounds would have a direct/indirect impact on the property and character of the landscape.	Demesne landscapes as identified by the NIAH Garden and Designed Landscapes Survey have been identified on the constraints mapping. Consultation has taken place with the Architectural Heritage Advisory Unit and the National Inventory Architectural Heritage for buildings and garden surveys.
Impact on ACA: Potential for impacts if OHL structures are located within Architectural Conservation Areas. Buildings, spaces, archaeological sites, trees, views and other aspects of the environment form an essential part of the character of ACA's and should be protected.	ACA's have been identified on the constraints mapping. Consultation has taken place with the Architectural Heritage Advisory Unit and the National Inventory Architectural Heritage for buildings and garden surveys and all relevant local authorities.

8.2.4 Baseline Information for Region

Key baseline information on Cultural Heritage within the study area is presented in **Figure 8.2.1 to Figure 8.2.5** at the end of this section. Summary text describing baseline information can be found in **Appendix A** and a detailed report is provided in **Appendix D**.

8.2.5 Key Considerations

The desktop study for cultural heritage has shown that there is a large above ground and below ground archaeological resource within the study area and a substantial amount of architectural heritage sites. The sites and areas are listed within this study and marked on the accompanying figures.

Archaeological Heritage

There are three sites located within the study area on the Tentative List for nomination onto the UNESCO World Heritage List relating to archaeological heritage, Dún Ailinne, Co. Kildare which was the Royal site for the Kings of Leinster, the Early Medieval Monastic Site of Glendalough, Co. Wicklow and the Rock of Cashel in Co. Tipperary. These sites are of outstanding cultural heritage value.

There are 253 national monuments in state ownership or guardianship within the constraints study area. The setting and visual amenity of these sites must be considered. In addition to these there are 297 RMP sites that have been imposed with Preservation Orders. These sites, whilst not in the ownership or guardianship of the state, are considered to be national monuments. Similarly the 22 town defences sites within the study area are now also considered to be national monuments and they are in private or local authority ownership.

A total of 21,795 RMP sites belonging to various periods are listed within the study area indicating a continuance of activity and settlement in the region since at least the Neolithic period with some early Mesolithic activity along the coast.

Architectural Heritage

There are over 8,733 RPS sites and 13,831 NIAH sites that are of regional significance and above in the study area. The RPS record will continue to be added to as structures, buildings and features of merit are identified and as resources permit. There are also 71 ACA within the study area.

In addition there are demesnes, and their associated structures and features and their designed landscape setting identified within the study area.

General Archaeological Potential

The RMP sites classified as historic towns and deserted medieval settlements have a zone of archaeological potential around them; these sites contain several related archaeological monuments. Each of these sites and their associated features should be considered as a composite site rather than individual monuments. This is also the case with ecclesiastical sites and monastic sites, castle manors and field systems.

Consideration should be given to the sites classified in the RMP as 'linear earthworks' and roads (road/trackway and toghers). These features are linear in nature and therefore present a consideration particularly for linear infrastructure crossings of intact sections.

A large number of sites in the study area were previously unknown subsurface sites which were discovered as a result of the development of the road networks and pipeline schemes. Many of the excavations that yielded archaeological evidence have since been added to the RMP record. These excavations indicate the subsurface archaeological potential of the landscape within the study area in areas.

Rivers, estuaries and coastal areas within the study area are considered a significant feature of archaeological potential, which although not subject to statutory protection under the National Monuments Acts, should be considered as there is a potential to reveal archaeological sites or industrial heritage features in their vicinity. The navigable rivers in the southern part of the study area (the Barrow, the Nore and the Suir) are of particular archaeological potential as these would have formed the route ways of the past into the interior. The extensive Viking site at Woodstown, Waterford (now a national monument) is an example of a large site that can be identified on the shores of a river. Similarly other landscape features such as prominent ridges and hills and fertile plains would

have attracted certain site types. Bog/wetland land and gravel ridges often have undiscovered buried archaeological remains within them.

General Architectural Heritage Potential

There are 1,508 NIAH Historic Garden and Designed Landscape sites located in the study area Survey. These sites have been mapped for the project. Some sites will already be listed in the RPS or NIAH building surveys and others, particularly relict landscapes with the main structures gone or designed landscapes severed from the main house, may not be recorded. The nature, significance and extent of these sites are, as yet, unknown.

Unrecorded cultural heritage features will be identified and articulated to ensure that these sensitive values may be duly considered in the context of change in the future.

Emerging Cultural Heritage Potential

All archaeological and historic sites/features and properties with statutory designation in each county are the key considerations in the constraints study in relation to cultural heritage, these sites have been identified and mapped for the constraints study.

However, in addition to these key sites, during the course of the constraints study areas of potential have emerged in each county, these are listed in **Table 8.2f**. Given the size of the study area this list is necessarily broad and non-exhaustive and will be developed through further research and field work during each stage of the project.

Table 8.2f: Emerging Potential Considerations per County

County	Cultural Heritage Potential Areas (emerging from the recorded presence)
Dublin	<p>Piperstown cairn complex.</p> <p>Slievethoul/Crockaunadreenagh complex of megalithic and prehistoric burial sites.</p> <p>The Ballcorus Lead Works.</p> <p>There is a particular concentration of sites on the southeastern slopes of the Dublin mountains i.e. in the area of Newtown / Glencullen / Killegar / Barnaslingan etc. sloping down to the sea where there is a notable cluster (a concentration that continues down towards Wicklow).</p> <p>Sites from all periods are located along the river valleys along which there is a high density of recorded monuments.</p>
Kildare	<p>The prehistoric barrow complex on the plains of The Curragh.</p> <p>The area of the Curragh, Dun Aillinne and Old Killcullen should be considered as one of archaeological potential.</p> <p>The raised bogs are largely unexplored landscapes and it is likely that further sites from all periods would be present e.g. Cloney and Carbury.</p> <p>Mullamast Hill (to the east of Athy), there is a concentration of barrows and enclosures on this hill, other notable clusters of ring ditches and enclosure sites around Athy.</p> <p>Ards skull Motte.</p> <p>Brewel Hill.</p>

County	Cultural Heritage Potential Areas (emerging from the recorded presence)
Wicklow	<p>The area around the Baltinglass Hills on the western side of the Wicklow Mts., a megalithic hillfort complex at Brusselstown /Spinans Hill, prehistoric complexes on Keadeen/Carrig Mts. Tuckmill Hill, Colvinstown Upper, Rathcoran and Tinoranhill.</p> <p>Rath East (Rathgall)/ Knockeen Hillforts.</p> <p>Tournant prehistoric complex (south of Dunlavin).</p> <p>Cluster of bivallate ringfort sites, hut and settlement sites on the slopes of Church Mountain, (including the Pipers stones in Athgreany) in the Donard - Hollywood area.</p> <p>Large early Palladian mansions of Powerscourt House, Russborough House which were designed to take in views of the surrounding landscapes.</p> <p>Mining Heritage.</p> <p>St Kevin's Way from Hollywood/Valleymount to Glendalough.</p>
Laois	<p>The Heath prehistoric barrow complex.</p> <p>Multi-period landscape around the Rock of Dunamase, sheltered by low slung hills.</p> <p>The bog lands have a proven archaeological potential in this county.</p> <p>Extensive complex of low lying earthworks and cropmarks around Aghaboe, representing a complex early medieval and medieval settlement landscape.</p> <p>Mining heritage recently documented in Cullenagh Hills.</p> <p>Extensive zone of archaeological potential around Ballyprior and Ballycoolan with a range of sites from all periods within it, this area lies to the north of the medieval settlements at Clopook.</p>
Carlow	<p>Rainestown Archaeological Complex.</p> <p>While all the rivers in the county would have attracted activity during all periods there is a relatively large number of sites along the Dereen River.</p> <p>There is a large number of related sites in Sligduff townland.</p> <p>There is a concentration of sites on Eagle Hill.</p> <p>Ballon Hill flat cemetery and ring barrow sites.</p> <p>The southernmost tip of the county is the complex at St Mullins, a large buffer zone would be required around this monument to include the watercourse.</p> <p>Several cairns and settlement sites on the western side of the Dranagh Mountain.</p> <p>Hillfort at Ballinkillin.</p> <p>Killcarrig, to the southeast of Bagnelstown (Muine Bheag) comprising several ringforts and enclosures and field systems. There is a large zone of potential around Dunleckny northeast of the town also.</p> <p>Aerial survey across the county has indicated a large subsurface potential in the level fertile areas of the county.</p>
Wexford	<p>There is highly significant archaeological potential of the river Suir and the Suir/Barrow estuary and along the bays and inlets of the coast.</p> <p>The archaeological potential of the River Slaney is significant and it has attracted a significant number of demesnes and designed landscapes.</p> <p>Kilmokea Fort in Great Island contains many medieval features within a large zone of potential and is adjacent to a large rampart site; it also has gardens</p>

County	Cultural Heritage Potential Areas (emerging from the recorded presence)
	<p>associated with it. To the southeast of this is a large deserted medieval settlement site containing many earthworks.</p> <p>Mining heritage.</p> <p>Complexes of enclosures in the Graigue/Ballymadder at the coast.</p>
Kilkenny	<p>Significant numbers of deserted medieval settlements (32), these sites have large areas of potential around them.</p> <p>Complex of sites in the general area of Lismaine/Inchmore, Clintstown and Foulksrath comprising many enclosures and ring ditches.</p> <p>Number of sites in Coolgrange/Moonhall dating from the Iron Age to the medieval period (includes Freestone Hill). To the south of this are numerous monuments in Rathclash.</p> <p>Several sites are preserved in the Lyrath Demesne.</p> <p>Large concentration of multi-period sites on the bend of the river Nore at Jerpoint West and Jerpoint Church comprising the National monument and several associated features and sites that date as far back as the Neolithic period.</p> <p>Brandon Hill.</p> <p>Aerial surveys across some of the county have identified an extensive subsurface potential in the low lying central plain for ploughed out sites.</p> <p>The river Nore has a proven archaeological potential as has the river Barrow.</p> <p>Significant number of demesnes/ designed landscapes are situated along the river Nore and Barrow, many of these preserve archaeological monuments within the landscape.</p> <p>Bog and peatland areas to the west of the county e.g. Galmoy have a proven archaeological potential</p>
Tipperary	<p>The Littleton Bog complex is considered to be a highly significant archaeological resource as demonstrated by the numerous stray finds and archaeological sites identified within it e.g. the Lurgoe archaeological complex with enclosures, toghers, wooden remains and find spot of the Derrynaflan Hoard.</p> <p>There are a relatively large number of extensive deserted medieval settlements (19) and field systems and enclosure complexes in the study area. These may have large areas of potential around them e.g. Shanbally (Lisronagh), Friarsfield, Rathbrit, Coolleagh, Foulkstown Complex.</p> <p>Clasganny Archaeological Complex (Cairns and Hut sites).</p> <p>The setting and large visual amenity area of Cashel.</p> <p>There are Town Walls Conservation Management Plans for Cashel, Fethard and Clonmel.</p> <p>The Slievenamon Hills and valley of the Linguan River.</p>
Waterford	<p>Coumaraglin Mountain prehistoric landscape.</p> <p>The river Blackwater / Bride is of significant archaeological potential.</p> <p>There are a considerable number of demesnes/ designed landscapes along the river Blackwater and also between Dungarvan and Waterford.</p> <p>Mining heritage.</p> <p>Dungarvan Valley Caves Project between Dungarvan and Lismore, where finds of Mesolithic period have been identified. Relict cave systems e.g. Kilgreany.</p> <p>Bally Lough research project area and field walking studies have established</p>

County	Cultural Heritage Potential Areas (emerging from the recorded presence)
	<p>the coastal archaeological potential of the county.</p> <p>There is highly significant archaeological potential along the river Suir and the Suir/Barrow estuary.</p> <p>The field systems in the county have large zones of archaeological potential around them.</p>
Limerick	Subsurface archaeological potential particularly for prehistoric sites.
Cork	<p>The Cork study area, for its size, has a relatively dense number of monuments within it making it difficult to identify notable clusters or complexes.</p> <p>There is a notable cluster of mound barrows northeast of Castlemartyr.</p> <p>Large zones of potential around the monuments that lie to the southwest of Midleton (sites includes a linear earthwork, field systems enclosures and a castle).</p> <p>The hill-top enclosure at Caherdrinny is surrounded by several monuments dating from all periods (extending into Ballynachheragh).</p> <p>There is an early medieval landscape around Knockraha, comprising enclosures, ringforts and churches.</p> <p>There are a relatively large number of fulachta fiadh sites in the Cork study area and there is a potential that any earth moving works in the area may uncover similar unrecorded sites.</p> <p>The coastal zones bays inlets and islands are of archaeological potential.</p>

8.3 LAND USE

8.3.1 Objective

The SEA of the Grid25 IP does not identify specific objectives in relation to land use; however, it does include related considerations under the headings Population and Human Health, Material Assets and Soil and Biodiversity. These are:

- Minimise proximity of development to concentrations of population in order to reduce actual and perceived environmental effects:
- To minimise effects upon sustainable use of land, mineral resources or soils; and
- To avoid significant impacts on relevant habitats, species, environmental features or other sustaining resources in Wildlife Sites.

8.3.2 Scope

Some land use considerations are important in the identification of corridors, while other considerations e.g. agriculture comprise issues for the later stages in the project development and therefore require understanding at this early stage of project development.

The study area comprises a broad band of countryside covering all of counties Carlow, Waterford, Wexford and Wicklow, most of Kilkenny, and to a lesser extent Cork, Kildare, Laois and. A small portion of County Limerick, South Dublin and Dun Laoghaire Rathdown are also included.

This section reviews the main land use activities and characteristics of the study area. The material sources consulted as part of the desk study are as follows:

- A desk-top review of www.myplan.ie;
- A desk-top review of the Regional Planning Guidelines and County Development Plans to inform consideration of main land uses and activities within the study area;
- A desk-top review of sectoral interest development plans and information;
- Corine Land Cover Dataset for 2006 www.epa.ie;and
- A review of major planning applications within the study area. While not presented in this report, the information will be used at the next phase, when identifying and assessing feasible route corridor options for the Grid Link Project.

8.3.3 What is the Issue?

The key issues associated with transmission lines and land uses and associated activities are outlined below in **Table 8.3a**.

Table 8.3a: Key Issues Associated with Transmission Lines and Land Use

What is the Issue?	How is this Addressed in the Constraints Report and Mapping
<p>Impacts to Land and Buildings:</p> <p>The introduction of an OHL could potentially result in changes in land use and patterns especially within or in proximity to existing settlements e.g. could influence the development approach to layout or height of a planned development.</p>	<p>Major population centres (cities, major towns and small towns) have been identified on the constraints mapping as has population density within the study area.</p> <p>Geodirectory information has been considered but not mapped at this stage due to the size of the study area.</p> <p>Landcover based on the Corine land cover dataset has been mapped. This Corine land cover mapping shows natural and non-natural landcover.</p>
<p>Tourism:</p> <p>The introduction of transmission infrastructure into the landscape has the potential to result in inter-visibility effects between transmission infrastructure and major tourist attractions.</p>	<p>Major tourist attractions have been identified on constraints mapping.</p> <p>Scenic routes, views and prospects, high amenity areas, sensitive landscapes, areas of outstanding natural beauty and landscape sensitivity zones have been identified on the constraints mapping and details are provided in Appendix F and G of this Report.</p>
<p>Recreational Amenity:</p> <p>Potential to impact, directly or indirectly, on visual amenities for recreation (e.g., walking trails).</p> <p>They also have potential to impact, directly or indirectly on airstrips, aerodromes or recreational air space.</p>	<p>Forestry, walking and cycling trails, and rivers have been identified on the constraints mapping as have airports and airfields.</p> <p>Scenic routes, views and prospects, high amenity areas, sensitive landscapes, areas of outstanding natural beauty and landscape sensitivity zones have been identified on the constraints mapping.</p>
<p>Economic Activity:</p> <p>Construction has the potential to temporarily impact on economic activity.</p>	<p>Major population centres (cities, major towns and small towns) have been identified on the constraints mapping as has population density within the study area.</p> <p>Corine land cover including agricultural, forestry, industrial / commercial etc. has been mapped.</p>
<p>Quarries and Mines:</p> <p>See Table 7.2.</p>	<p>Registered quarry and mining sites have been identified on the constraint mapping.</p>
<p>Landfill sites:</p> <p>See Table 7.2.</p>	<p>Registered landfill sites have been identified on the constraints mapping.</p>

8.3.4 Baseline Information for Region

Key baseline information on Land Use within the study area is presented in **Figure 8.3.1 (1-4)**, **Figure 8.3.2 (1-4)** and **Figure 8.3.3** at the end of this section and text describing baseline information relating to Land Use for the study area can be found in **Appendix A**. The Corine land cover data presented on **Figure 8.3.1 (1-4)** represents the level 2 dataset as per Corine Land Cover nomenclature developed by the European Environment Agency. There are 6 levels in total, each providing a greater degree of clarification of information. The additional levels will be used at the most appropriate stage in the project development.

8.3.5 Key Considerations

Existing transmission lines and infrastructure are evident throughout the study area - they traverse a variety of land uses and co-exist with the various activities undertaken therein. Accordingly, while most land uses / activities need to be considered throughout the various stages of the Grid Link Project few would represent a significant constraint. Possible exceptions include where there are concentrations of quarries and mines and landfills.

However, in order to reduce the potential effect of the project in terms of the number of people affected and the degree to which they are affected the Grid Link Project should avoid, where possible, heavily populated areas (i.e. the cities and towns within the study area) on the grounds of general amenity. These are also areas with the greatest concentration and mix of land use and activities. Where it will be necessary to develop in such areas (e.g., around the nodes of Knockraha and Great Island in particular) amenity considerations need to be taken into account during the detailed line route selection and design phases.

It is also recommended that the Grid Link Project where possible avoids areas and sites recognised for their amenity (e.g., major tourism sites). The significance of these will need to be taken into account throughout the project in consultation with the relevant sectoral prescribed bodies.

8.4 INFRASTRUCTURE AND UTILITIES

8.4.1 Objective

The SEA of the Grid25 IP does not identify specific objectives in relation to infrastructure and utilities; however, it does include related considerations. One key related objective is set out below:

- To minimise effects upon sustainable use of land, mineral resources or soils.

8.4.2 Scope

The material sources consulted as part of the desk-top study are as follows:

- A desk-top review of the existing networks and development plans of utility companies e.g. Iarnród Éireann, supplemented where possible with consultation with representatives from these companies;
- A desk-top review of Regional Planning Guidelines and County Development Plans to inform the baseline in relation to infrastructure provision, policies and proposals within the study area; and
- A review of major planning applications within the study area. While not presented in this report, the information will be used at the next phase, when identifying and assessing feasible route corridor options for the Grid Link Project.

8.4.3 What is the Issue?

The key issues associated with transmission lines and other infrastructure and utilities were outlined previously in **Table 7.1**.

8.4.4 Baseline Information for Region

Key baseline information on Infrastructure and Utilities within the study area is presented in **Figure 8.4.1 (1-4)** and **Figure 8.4.2 (1-4)** at the end of this section and text describing baseline information can be found in **Appendix A**.

8.4.5 Key Considerations

Existing and proposed infrastructure and utilities have the potential to influence the identification and evaluation of route corridor options. Those of particular relevance at this stage are ones to which we need to achieve essential or statutory operating clearance requirements (i.e. requiring avoidance or buffering e.g. Waterford Airport). Other infrastructure and utilities considerations will be important considerations at detailed line design stage.

8.5 SOILS AND GEOLOGY

8.5.1 Objective

The SEA of the Grid25 IP identified three key objectives in relation to soils, geology, hydrology and hydrogeology as follows:

- To prevent impacts upon the status of surface waters;
- To prevent pollution and contamination of groundwater; and
- To minimise effects upon the sustainable use of land, mineral resources or soils

These objectives will influence the consideration of soils, geology, hydrology and hydrogeology throughout each stage of this project.

8.5.2 Scope

A desktop study was undertaken to identify the soils, geological, hydrological and hydrogeological features of the study area. The value of each feature within the study area was then assessed to assess possible impacts on the soils, geology, hydrology and hydrogeology.

The material sources consulted as part of the desk study are as follows: -

- Aerial photography (source: Google maps);
- Ordnance Survey of Ireland (OSI) mapping for rivers and streams and topography;
- A review of the Geological Survey of Ireland (GSI) Public Data Viewer for geohazard locations (such as landslides or karst), soils and bedrock data, mineral/quarry locations, groundwater mapping;
- Consultation with the GSI in relation to Geological Heritage Sites;
- A review of the National Parks & Wildlife Service (NPWS) natural heritage database for designated areas of ecological interest and sites of nature conservation importance (SAC, SPA, NHA) within and adjacent to the study area; and
- Flood data and water quality and status data obtained from OPW and EPA (www.opw.ie , www.floodmaps.ie, www.epa.ie).

8.5.3 What is the Issue?

The key issues associated with transmission lines on soils, geology, hydrology and hydrogeology are outlined below in **Table 8.5a**.

Table 8.5a: Key Issues Associated with Transmission Lines and Soils, Geology, Hydrology and Hydrogeology.

What is the Issue?	How is this Addressed in the Constraints Report and Mapping
<p>Permanent Removal of Soils/Bedrock:</p> <p>Permanent removal of soils/bedrock may be necessary to facilitate construction of foundations for OHL structures as well as sub-stations. It is likely that removal of a greater amount of material will be required in poorer ground due to larger/deeper foundations being required.</p> <p>Some temporary removal may also be required in areas of poorer ground where a suitable platform is required for access road construction.</p>	<p>Ground conditions (deep peat areas, karst features, deep soft silt/clay deposits, etc.) have been mapped.</p>
<p>Consolidation of Soils Reducing Permeability and Increasing Runoff Potential:</p> <p>Potential risk of consolidation of soils beneath construction, and to a much lesser extent maintenance plant, which will in turn reduce permeability of soils and increase the risk of surface water runoff, and potentially erosion in erodible soils.</p>	<p>Ground conditions (deep peat areas, karst features, deep soft silt/clay deposits, etc.) and watercourses have been mapped.</p>
<p>Contamination of Soils, Geology, Surface Water and Groundwater From Hazardous Substances:</p> <p>Potential risk of contamination of ground and water bodies through spills or leaks from hazardous substances used on site during construction or maintenance.</p>	<p>Aquifer vulnerability has been mapped.</p>
<p>Peat Instability:</p> <p>Where peat is encountered, peat instability during construction could affect site and surrounding infrastructure, as well as contamination of watercourses with peat.</p>	<p>Ground conditions (deep peat areas) as well as landslide geo-hazards (relic failures) have been mapped (based on Ireland wide RPS landslide susceptibility mapping).</p>
<p>Presence of Karst Features:</p> <p>Areas of karst may present issues with voids/depressions below foundations.</p>	<p>Karst features have been mapped.</p>
<p>Flooding:</p> <p>Potential for increase in surface water runoff where soils are compressed or more impermeable areas are constructed, such as at sub-stations.</p> <p>Potential risk of blocking of existing drainage channels during construction which could cause overwhelming of drainage system and cause flooding.</p>	<p>OPW flood plains have been identified on the constraints mapping.</p>
<p>Changes in Local Hydrology/Hydrogeology:</p> <p>Local hydrological drainage paths altered due to potential for increased runoff or blockage and excavation where groundwater is high.</p>	<p>Ground conditions, watercourses and aquifer vulnerability have been mapped.</p>

8.5.4 Baseline Information for Region

Key baseline information on Soils, Geology and Hydrogeology in the study area is presented in **Figure 8.5.1 to 8.5.2** at the end of this section and text describing baseline information can be found in **Appendix A**.

8.5.5 Key Considerations

- There are a number of areas within the study site where there is potential risk of peat instability (see **Figure 8.5.2**).
- There are areas of compressible soils in the study area that would require additional works to facilitate foundations and access to sites.
- Areas of erodible soils are present in the study area and suitable mitigation measures should be implemented to minimise the risk of erosion while soils are exposed during construction.
- Karst features have been identified within the study area, which could create issues for foundation construction and integrity.
- Vulnerable aquifers have been identified within the study area. Mitigation measures should be identified where these areas cannot be avoided to minimise impact to water being extracted.
- A number of sensitive water channels (rivers and streams, waterbodies) have been identified within the study area.
- Geological Heritage Sites.

8.6 BIODIVERSITY

8.6.1 Objective

The SEA of the Grid25 IP identified three key objectives in relation to biodiversity as follows:

- To ensure compliance with the Habitats Directive with regard to the protection of Natura 2000 Sites and Annexed habitats and species.
- To ensure compliance with Article 10 of the Habitats Directive with regard to the management of other environmental features – which by virtue of their linear and continuous structure or their function act as stepping stones - which are of major importance for wild fauna and flora and essential for the migration, dispersal and genetic exchange of wild species.
- To avoid significant impacts on relevant habitats, species, environmental features or other sustaining resources in Wildlife Sites.

These objectives will influence the consideration of biodiversity throughout each stage of this project.

8.6.2 Scope

A desktop study was undertaken to identify areas of significant ecological importance in the study area which will be used to inform the corridor identification later in the process.

The material sources consulted as part of the desk study are as follows: -

- Ecology Guidelines for Electricity Transmission Projects. A Standard Approach to Ecological Assessment of High Voltage Transmission Projects (EirGrid, 2012);
- A review of the National Parks & Wildlife Service (NPWS) natural heritage database for designated areas of ecological interest and sites of nature conservation importance (SAC, SPA, NHA and pNHA) within and adjacent to the study area;
- A review of the following datasets: -
 - Important Bird Areas (NPWS and Birdwatch Ireland);
 - Water Framework Directive website (www.wfdireland.ie);
 - Bat Conservation Ireland (<http://www.batconservationireland.org/>);
 - Corine land cover database and Grid25 Mapping of Annex I Habitats; and
 - Available NPWS datasets on Annex I Habitats (Nephin Releve Habitats, Woodland Habitats, Croaghaua Slievemore Habitats and MSE Habitats).

8.6.3 What is the Issue?

The key issues associated with transmission lines on biodiversity are outlined below in **Table 8.6a**.

Table 8.6a: Key Issues Associated with Transmission Lines and Biodiversity

What is the Issue?	How is this Addressed in the Constraints Report and Mapping
<p>Bird Collision:</p> <p>Species using flightlines on migration routes, travelling between moulting and breeding grounds, or to or from roosting sites, and foraging beyond breeding grounds could be affected due to potential collision with the power lines (including earth wires).</p> <p>Transmission lines may also have the potential to impact on recently introduced raptors that may be susceptible due to their foraging range, roosting locations and sub-adult gathering areas.</p>	<p>SPA, Ramsar sites and Important Bird Areas have been identified on the constraints mapping.</p>
<p>Bird Electrocutation:</p> <p>Potential for birds sitting or perching on structures and /or conducting cables to be electrocuted if they cause short circuits.</p>	<p>SPA, Ramsar sites and Important Bird Areas have been identified on the constraints mapping.</p>
<p>Fragmentation:</p> <p>Potential loss of semi natural or protected habitats at OHL structure locations and sub-stations. Potential loss or damage to hedgerows and tree lines which are important wildlife corridors for numerous species, particularly bats. Potential for OHL to obstruct mammal movements during the construction stage e.g. otters.</p>	<p>SAC, (p)NHA, Annex 1 Habitats, bat sites and Important Bird Areas have been identified on the constraints mapping.</p>
<p>Habitat Damage or Loss:</p> <p>Potential for direct loss or damage to habitats and species during site clearance and in particular, risk to Annex I Habitats and protected flora species.</p>	<p>SAC, (p)NHA, and Annex 1 Habitats have been identified on the constraints mapping.</p>

8.6.4 Baseline Information for Region

Key baseline information on Biodiversity in the study area is presented in **Figure 8.6.1 (1-4)**, **Figure 8.6.2 (1-4)** and **Figure 8.6.3 (1-4)** at the end of this section and text describing baseline information can be found in **Appendix A** and principle datasets relating to biodiversity are included in **Appendix B**.

8.6.5 Key Considerations

- All designated areas for nature conservation within the study area have been identified and mapped.
- Forty three SAC occur within the defined study area, designated as internationally important for various protected habitats and species.

- Twenty SPA occur within the defined study area, designated as internationally important for birds. Transmission infrastructure has the potential to interfere with bird flight paths and result in bird collisions, therefore SPA are considered highly sensitive locations.
- SAC and SPA comprise part of the European Natura 2000 Network and throughout the various stages of the project it will be necessary to ensure that the proposed transmission line and associated infrastructure *will not adversely affect the integrity of these sites or conservation objectives*.
- River Slaney Valley, River Barrow and River Nore, the Lower River Suir and Blackwater SAC are considered key areas of constraint as they are likely to provide key ecological corridors for a number of species.
- Within the study area, eight rivers are designated for Freshwater Pearl Mussel (FPM), a species which is highly sensitive to pollution including siltation. Freshwater Pearl Mussel Catchment Areas will have to be considered a key constraint as they are highly sensitive to any construction works.
- Within the study area, six rivers are designated Salmonid Waters. These rivers and designated sections therein will have to be considered a key constraint as they are highly sensitive to any construction works, particularly during the spawning period.
- Within the study area there are examples of habitats and species of conservation concern outside of protected areas. There are a number of examples of Annex 1 habitat which occur outside of designated areas and where they occurs they must be treated with the same concern as designated habitat. Mobile species are also an issue i.e. birds, fish etc. flight paths, migration routes etc must therefore be considered.
- Three NHA and 210 pNHA (see **Appendix E**) occur within the defined study area. These areas and any relationships that may exist between these sites and other designated sites (e.g. SAC, SPA) must be considered in the development of suitable route corridors.
- The overall length of Grid Link Project has the potential to result in cumulative impacts to habitats and species arising from fragmentation and loss of habitats. Cumulative loss of hedgerow along the length of the route will be a key concern in relation to bats for example. Loss of possible roosting and breeding sites for badgers, birds, otters and bats will also be a key consideration

8.7 WATER

8.7.1 Objective

The SEA of the Grid25 IP identifies the Water Framework Directive (WFD) as the main driver for water management throughout Europe and includes two key objectives in relation to water as follows:

- To prevent impacts upon the status of surface waters in line with the recommendations outlined in the River Basin Management Plans prepared under the Water Framework Directive; and
- To prevent pollution and contamination of groundwater in line with the recommendations outlined in the River Basin Management Plans.

8.7.2 Scope

A desktop study was undertaken to identify the main water bodies of the study area, their ecological and chemical status, in accordance with the relevant River Basin Management Plans prepared under the EU Water Framework Directive and key issues related to water quality status and the objectives outlined in the River Basin Management Plans.

The material sources consulted as part of the desk study are as follows: -

- A review of the River Basin Management Plans for the Eastern, South Eastern and South Western River Basin Districts which are included within the study area (see **Figure 8.7.1**). Sub basin plans prepared for the Freshwater Pearl Mussel under The European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations 2009 were also reviewed (See **Section 8.6.4.7** of Biodiversity, Appendix A).
- A review of the Register of Protected Areas established under Article 6 of the Water Framework Directive (2000/60/EEC) and maintained by the EPA. The register includes those areas within each River Basin District which have been designated as requiring special protection under specific community legislation for the protection of their surface water and groundwater or for the conservation of habitats and species directly depending on water;
- A review of the sites included in the EPA commissioned project “Management Strategies for the Protection of High Status Water Bodies”; and
- A review of the interim status update for water bodies published by the EPA in June 2011.

8.7.3 What is the Issue?

The key issues associated with transmission lines on water are outlined below in **Table 8.7a**.

Table 8.7a: Key Issues Associated with Transmission Lines on Water Quality

What is the Issue?	How is this Addressed in the Constraints Report and Mapping
Pollution: Potential for accidental spillage of fuel, chemicals or	All watercourses, including High Status Sites (under the Water Framework), have been identified on the

What is the Issue?	How is this Addressed in the Constraints Report and Mapping
<p>sewage causing pollution to surface or ground water during construction or maintenance activities.</p> <p>Road access to remote areas and topsoil stripping and the installation of foundations could have the potential to create sedimentation issues through increased suspended solids and sediment deposition.</p>	<p>constraints mapping. In addition Freshwater Pearl Mussel designated sites, SAC, Salmonid Waters, WFD Register of Protected Areas (drinking water, recreational waters, nutrient sensitive waters, water dependent habitats and economically significant aquatic species) have all been identified on the constraints mapping.</p>
<p>Physical Damage to Watercourses:</p> <p>Any works that take place in close proximity to a water body have the potential to cause physical damage. Physical damage can impact on the hydromorphology of the watercourse and therefore the ecological status.</p>	<p>All watercourses, including High Status Sites (under the Water Framework), have been identified on the constraints mapping. In addition Freshwater Pearl Mussel designated sites, SAC, Salmonid Waters, WFD Register of Protected Areas (drinking water, recreational waters, nutrient sensitive waters, water dependent habitats and economically significant aquatic species) have all been identified on the constraints mapping.</p>
<p>Flooding:</p> <p>Areas at risk of flooding can pose a risk to locating any new sub-stations or extending the footprint of existing sub-stations. In addition, repeated flooding could lead to erosion of material at the base of OHL structures.</p>	<p>OPW flood plains information has been identified on the constraints mapping.</p>

8.7.4 Baseline Information for Region

Key baseline information on Water in the study area is presented in **Figures 8.7.1 to 8.7.7** at the end of this section and text describing baseline information can be found in **Appendix A**.

8.7.5 Key Considerations

- Water related issues are generally not a significant environmental constraint at corridor identification stage as a considerable body of mitigation measures and best practice construction management have been developed in relation to work in or near watercourse which can remove the potential for significant impact to aquatic flora and fauna.
- Within the study area there are 80 rivers, 3 lakes and 1 coastal water that are classified by the Environmental Protection Agency as high status. These sites play an important part in conserving individual species and overall catchment biodiversity.
- Under the Water Framework Directive, River Basin Management Plans (RBMP) and Programmes of Measures (PoM) have been developed for the various River Basin Districts around Ireland. Three are relevant to the study area: Eastern RBMP; Southeastern RBMP and Southwestern RBMP. The programme of measures for each district will be an important reference for the project as it moves forward.

A number of considerations for water also overlap with biodiversity e.g. water dependent SAC; freshwater pearl mussel sites; shellfish waters and the reader is therefore directed to **Section 8.6** also for completeness.

8.8 LANDSCAPE AND VISUAL

8.8.1 Objective

The SEA of the Grid25 IP identified one key objective in relation to landscape as follows:

- To avoid significant adverse impacts on the landscape, especially with regard to those arising from impacts on the factors which comprise the Landscape.

This objective will influence the consideration of landscape and visual assessment throughout each stage of this project.

8.8.2 Scope

This Chapter reviews the potential landscape and visual constraints from the proposed transmission line within the study area and was carried out through a review of the following:

- A review of the relevant development plans and their policies with regards to transmission lines and landscape (refer to **Appendix C**);
- A review of landscape character studies undertaken for the various counties within the study area (See **Appendix F**);
- Mapping of scenic routes, views and prospects (as outlined in the relevant development plans, refer to **Appendix G**);
- A review of the Landscape Constraints Rating mapping that was prepared for the SEA of Grid25 IP which combines Visual Sensitivity Mapping (as identified from the natural landcover types in the Corine land cover dataset) and Topographical Mapping; and
- Mapping of gardens, demesnes, walking and cycling routes.

8.8.3 What is the Issue?

The key issues associated with transmission lines on landscape are outlined in **Table 8.8a**.

Table 8.8a: Key Issues Associated with Transmission Lines and Landscape

What is the Issue?	How is this Addressed in the Constraints Report and Mapping
<p>Proximity to Scenic Routes:</p> <p>The introduction of an OHL to an area has the potential to impact on protected views, scenic routes and viewing points.</p>	<p>Scenic routes, views and prospects for all counties have been identified on the constraints mapping and details are provided in Appendix G and F.</p> <p>Landscape Character areas/types for all counties were reviewed but not mapped.</p>
<p>Effects on Landscape Character and Features:</p> <p>The character of the landscape is determined by</p>	<p>High Amenity Areas, sensitive landscapes, areas of outstanding natural beauty and landscape sensitivity</p>

What is the Issue?	How is this Addressed in the Constraints Report and Mapping
topography, geology cultural heritage, settlements patterns, existing infrastructure etc. Therefore the ability of the landscape character area to absorb transmission lines will vary depending on the landscape character area type and will need to be addressed at the corridor evaluation stage.	zones have been identified on the constraints mapping and details are provided in Appendix G and F. Landscape Character areas/types for all counties were reviewed but not mapped.
<p>Effects on Historical Landscapes:</p> <p>Transmission lines have the potential to impact on historical settings/landscapes within the study area.</p>	<p>Scenic routes, views and prospects, sensitive landscapes, areas of outstanding natural beauty, and gardens and demesnes, have been identified on the constraints mapping. Cultural heritage features such as RMP, NIAH and RPS (where available) are also mapped. ACA are recorded in the text of the document but are not mapped.</p> <p>Landscape Character Areas / types for all counties were reviewed but not mapped.</p>
<p>Residential and other Sensitive Receptors:</p> <p>The construction of an OHL can impede on visual receptor views.</p>	<p>Major population centres (cities, major towns and small towns) have been identified on the constraints mapping as has population density within the study area.</p>
<p>Effects on High Amenity Areas:</p> <p>High amenity areas are considered to be areas of outstanding natural beauty and / or have unique interest value. They are generally sensitive to development and the introduction of OHL and associated infrastructure to such areas could result in impacts on that landscape.</p>	<p>High Amenity Areas, sensitive landscapes, areas of outstanding natural beauty and landscape sensitivity zones have been identified on the constraints mapping and details are provided in Appendix G and F.</p>
<p>Effects on Skyline Ridges:</p> <p>Transmission lines have potential to impact on the views of the skyline through siting of lines and OHL structures.</p>	<p>Corine land use and altitudes of 200m and more are identified on constraints mapping.</p>

8.8.4 Baseline Information for the Region

Key baseline information on Landscape and Visual in the study area is presented in **Appendix A, Appendix F and Appendix G.**

8.8.5 Key Considerations

- There are a number of High Amenity Areas within the study area and these are considered key areas of constraint;
- The study area also contains numerous scenic routes, views and prospects as mapped on the figures contained with **Appendix G**;
- Another key consideration will be exposure to views by the public based on magnitude of change in visual resource with the viewer sensitivity;
- The capability of the landscape to absorb infrastructure such as an OHL will be a key consideration. Some landscape character areas/types are more adaptable than others and have a greater capacity to adapt to change; and

- Consideration of landscape features offers one of the most effective mechanisms for reducing impacts from transmission lines through appropriate siting. Possible ways to reduce impacts through appropriate siting in the landscape will be considered throughout the process.

9 NEXT STEPS

The next step in development of the Grid Link Project is to consult on this Constraints Report with a view to updating the report based on feedback and observations. Following this, EirGrid will develop route corridors. It is anticipated that these corridors will be developed for consultation in the first quarter of 2013.

The Project Team welcomes comments on this Constraints Report, which can be sent:

- By e-mail: gridlink@eirgrid.com
- By Telephone: freephone number –Lo-call 1890-422 122 (lines open between 12am to 6pm, Monday to Friday)
- By letter:

The Grid Link Project Manger
EirGrid
PO Box 12213,
Glenageary,
Co. Dublin
Ireland

Having established the study area and assembled all available data on the area for representation in a GIS database the next task will be to develop route corridors and sub-station sites. All route corridor options and sub-station sites developed must be technically feasible from a planning, environmental, legal, engineering and economic perspective as they represent the starting point for detailed route development hence the need for these “considerations” to be addressed early on.

Guiding principles will be applied to ensure that the corridors chosen take into account technical and environmental issues. The starting point for this is the SEA strategic environmental objectives for the Grid25 IP which are listed below. Experience from similar projects will also be taken into account.

9.1.1 Objectives from SEA of the Grid25 IP

The starting point in corridor selection are the Grid25 IP SEA strategic environmental objectives which are as follows:

- To ensure compliance with the Habitats Directive with regard to the protection of Natura 2000 Sites and Annexed habitats and species.
- To ensure compliance with Article 10 of the Habitats Directive with regard to the management of other environmental features – which by virtue of their linear and continuous structure or their function act as stepping stones - which are of major importance for wild fauna and flora and essential for the migration, dispersal and genetic exchange of wild species.
- To avoid significant impacts on relevant habitats, species, environmental features or other sustaining resources in Wildlife Sites.
- To avoid significant adverse impacts on the landscape, especially with regard to those arising from impacts on the factors which comprise the Landscape Constraints Rating.

- To avoid unauthorised impacts upon archaeological heritage (including entries to the RMP) and architectural heritage (including entries to the RPSs).
- To help to facilitate the achievement of higher level government targets contained in the Government's Energy White Paper Delivering a Sustainable Energy Future for Ireland -the Energy Policy Framework 2007-2020 and relating to the Kyoto Protocol.
- Minimise proximity of development to concentrations of population in order to reduce actual and perceived environmental effects.
- To prevent impacts upon the status of surface waters in line with the recommendations outlined in the River Basin Management Plans.
- To prevent pollution and contamination of ground water in line with the recommendations outlined in the River Basin Management Plans.
- To minimise effects upon the sustainable use of land, mineral resources or soils.

About EirGrid

EirGrid, a state-owned company, is the national operator of the electricity grid.

The national grid is an interconnected network of high voltage power lines and cables, comparable to the motorways, dual carriage ways and main roads of the national road network. It is operated at three voltage levels, 400 kV, 220 kV and 110 kV, and is approximately 6,400km in overall length.

The grid is the backbone of Ireland's power system and is vital to ensuring that all customers, including industrial, commercial and residential, from both rural and urban areas, have a safe, secure, reliable, economic and efficient electricity supply.

Contact Details

EirGrid is committed to ensuring that all members of the public are fully aware of the project and encourage you to participate in public consultation.

Write: The Grid Link Project Manager, EirGrid,
PO Box 12213, Glenageary, Co. Dublin, Ireland

Telephone: Lo-call 1890 422 122

Email: gridlink@eirgrid.com

See: www.eirgridprojects.com/projects/gridlink

Visit: The Grid Link Project Information Centres:

Midleton	Oikoseen House, Castleredmond, Midleton, Co. Cork	Every Monday from 12 noon to 6pm
Carrick-on-Suir	Carrick Community Business Centre at the Nano Nagle Centre, Carrick-on-Suir, Co. Tipperary	Every Tuesday from 12 noon to 6pm
New Ross	The Coach House, Marsh Lane, New Ross, Co. Wexford	Every Wednesday from 12 noon to 6pm
Carlow	Enterprise House, O'Brien Road, Carlow, Co. Carlow	Every Thursday from 12 noon to 6pm

Note: Project Information Centres are closed on Bank Holidays

What is Grid25?

Grid25 is a major initiative to put in place a safe, secure and affordable electricity supply throughout Ireland, supporting economic growth and utilising our renewable energy resource to its maximum potential.

Development of the grid is essential to provide a platform for renewed economic growth and regional development, and is vital if we are to effectively tap into our abundant renewable energy resources.

Grid25 will involve upgrading the high voltage system and an overall investment of approximately €3.2 billion in the period up to 2025. This new infrastructure is every bit as essential to the future growth of the country as any investment in road, rail and broadband.

The Grid Link Project is a major part of Grid25.