Capital Project 966

CP 966 Strategic Social Impact Assessment Scoping Report

May 2020

EirGrid

CP966

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Contents

Abbreviations	
ACA	Architectural Conservation Areas
AAP	Areas of Archaeological Potential
AEOS	Agri Environmental Options Scheme
AIS	Air insulated
ASI	Archaeological Survey of Ireland
CAFE	Cleaner Air for Europe
CFRAM	Catchment Flood Risk Assessment and Management
CPD	County Development Plan
CSO	Central Statistics Office
EHV	Extra High Voltage
EMF	Electromagnetic fields
EPA	Environmental Protection Agency
GIS	Geographic Information System
GSI	Geological Survey Ireland
HDD	Horizontal Directional Drilling
IGHS	Irish Geological Heritage Sites
i-WeBS	Irish Wetland Bird Survey
LCA	Landscape Character Area
MCA	Multi-Criteria Analysis
NIAH	National Inventory of Architectural Heritage
NHA/ pNHA	Natural Heritage Area/ Proposed Natural Heritage Area
NPWS	National Parks and Wildlife Services

Abbreviations	
OHL	OHL
OPW	Office of Public Works
PWS	Public Water Supply
RMP	Record of Monuments and Places
RPS	Records of Protected Structures
RBMP	River Basin Management Plan
SAC	Special Area of Conservation, designated under the EU Habitats Directive
SI	Statutory Instrument
SAOI	Social Area of Influence
SMR	Sites and Monuments Record
SPA	Special Protection Area, designated under the EU Birds Directive
TPC	Total Project Cost
TSO	Transmission System Operator
TSSPS	Transmission System Security and Planning Standards
UGC	Underground cable
WFD	Water Framework Directive
XLPE	Cross-linked polyethylene

Executive Summary

Capital Project 966 (CP 966) is a proposed development that will help transfer electricity to the east of the country and distribute it within the network in Meath, Kildare and Dublin. The project will help meet the growing demand for electricity in the east. This growth is due to increased economic activity and the planned connection of new data centres in the region. CP 966 aims to strengthen the transmission network between Dunstown substation in Kildare and Woodland substation in Meath - and suggests a number of technical solutions to do so.

The main three technological solutions being considered are:

- Technology 1: Up-voltage– 220 kV OHL circuits to 400 kV circuits (Gorman - Maynooth – Dunstown);
- Technology 2: New 400 kV OHL;
- Technology 3: New Under Ground Cable (UGC);
  - Option 3A: 220kV UGC (12m cable swathe);
  - Option 3B: 400kV UGC (one conductor per phase; single 12m cable swathe);
  - Option 3C: 400kV UGC (two conductors per phase):
    - Sub Option 3Ci: two conductors in a single 24m swathe;
    - Sub Option 3Cii: two conductors in two separate 12m swathes.

Note: Sub Option 3Ci has been ruled as not feasible in the Cable Feasibility Report (32108AE-REP-001) and so will not be considered in this assessment.

This Social Impact Assessment Scoping Report has been prepared to identify the social impacts that could occur as a result of the CP 966 project and to assess the three technologies under consideration. As part of this assessment, a Project Study Area has been developed and is used as the Social Area of Influence (SAOI) for this report. This area identifies where the technological solutions for CP 966 may be located. This report has been written in parallel with an Environmental Constraints Report for the project.

This report follows the methodology for Social Impact assessment as outlined in EirGrid's 'Draft Methodology for Social Impact Assessment', which was based upon international guidance. Social impacts refer to those impacts resulting from the project in both the construction and operational (energisation) phases. Socio-economic status, cultural identity, employment and educational opportunities, place and community attachment, health and overall sense of social cohesion may be changed or affected either positively or negatively by the project. The Social Impact Assessment process will identify these and look at way to address the impacts.

Different levels of Social Impact Assessment may be required at different Steps of the Framework. This report is the Step 3 Social Impact Assessment and it builds on the work done on Step 2. Further work on Social Impact Assessment will be done at the next step of the project.

The constraints within the study area have been categorised based on EirGrid's standard scale along a range from "more significant"/"more difficult"/"more risk" to "less significant"/"less difficult"/"less risk".

More significant/difficult/risk Less significant/difficult/risk

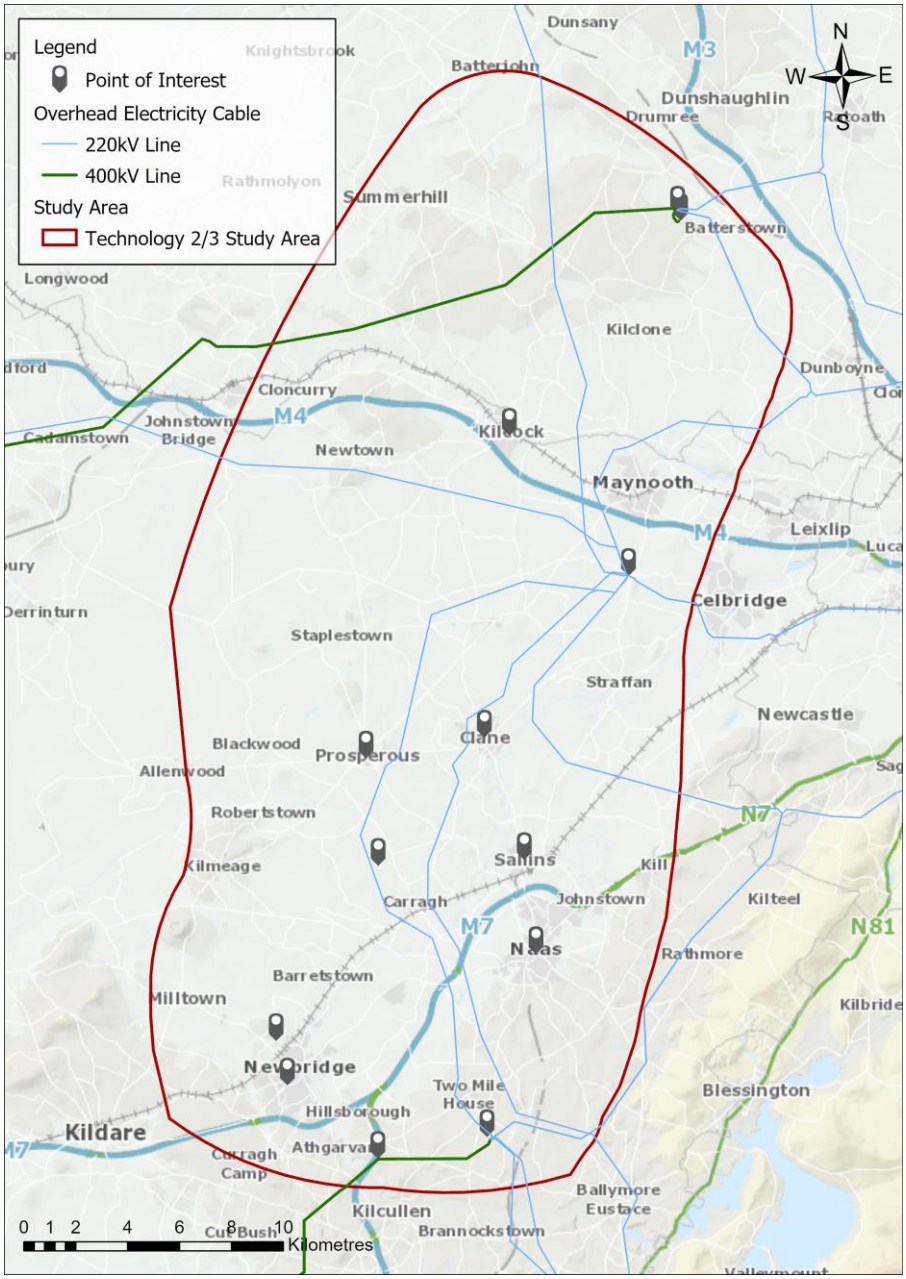


Figure Ex.1 CP 966 Project Study Area at Step 3 (December 2019)

The SAOIs for each technological solution for Step 3 mirror the study areas identified in CP 966 environmental Constraints report. The following overview of the revised SAOI takes the widest study area (technology 2 and 3) as its boundaries.

To address these potential impacts, some of which overlap with each other, the following topics have been considered in the context of each technical solution and, along with the performance of each technology on each topic, are described in Sections 6 to 9 of this report; with maps as appropriate in Appendix A.

- Amenity and Health: Here ‘amenity’ is the term used to describe the overall pleasantness or attractiveness of surroundings. This includes effects on local communities, community facilities, local businesses and recreation and tourism assets. This topic also considers potential effects on humans, this considers amenity effects as well as considering WHO health thresholds; EMF is considered as set out in EirGrid’s Guidelines.
- Economy: effects on the national, regional and local economy;
- Traffic & transport: this considers potential effects on traffic and transport in the study area, during the construction phases of the different solutions. Of concern to communities is the potential for severance,

isolation and significant delays during the construction phase. Also considered in this topic are potential effects on the crossings of major roads, railways and navigable waterways if relevant; and

- Utilities: consideration of third-party assets, including telecommunications and aviation.

Overview of the Project SAOI

To give an overview of the Step 3 SAOI, focus is on the region, settlements and major transport links within the project study area. More detailed baselines for each of the assessment topics are provided for each technological solution in Sections 6 to 9 of this report.

Amenity & Health

The SAOI lies within the Mid-East Region of Ireland and is within Counties Kildare and Meath. Project Ireland 2040 describes this region as having experienced high levels of population growth in recent decades, at more than twice the national growth rate. If the 2016 trend of internal migration outflows from Dublin to the other regions returns to 2006 levels, the mid-East region is projected to show the highest percentage population increases by 2036, from 690,9*00 in 2016 to 965,300 by 2036.

There has been a rapid population growth in the rural areas with an increasing number of single rural dwellings, typically in linear form along road fronts. Consistent with Project Ireland 2040's National Strategic Outcome of 'Compact Growth', Meath and Kildare County Development Plans have policies which attempt to focus any expansion of residential and commercial areas into the larger towns of the counties, however it is anticipated that there will be an increase in the number of linear settlements leading into and from both small and large towns.

There are major towns in the SAOI, including Newbridge, Naas, and Maynooth, all with populations of above 10,000. Newbridge is the largest of these with a population of 23,000 (2016). There are a number of other smaller towns with populations below 1,000. In addition to residential populations, these settlements host community facilities such as schools, churches, parks and recreational areas; employment areas; and retail areas.

90% of people in Meath and Kildare described (in the Census 2016) themselves as being in Good or Very Good health. The relatively high socio-economic status of the communities in the SAOI is a factor in this; the lower the levels of employment, income and education are associated with worsening determinants of health, in particular healthy life expectancy.

Economy

Industry, Commerce and Employment

There is a broad mix of industries within the SAOI, however 'Commerce' and Professional Services are the most numerous. The percentage of the population who are unemployed or looking for their first job in the settlements ranges from 6 to 9%; the national percentage is 7%; Kildare and Meath are also 7%.

There are many commercial and enterprise sites; including retail centres in the main settlements and business parks on the edges of these towns, including Carton Retail Park, Maynooth; the M4 Interchange Business Park, Maynooth; Clane Business Park; Kildare Business Park; Ladytown (Toughers) Business Park; and Naas Industrial Estate.

Land Use, Agriculture and Equine

In terms of land use, there a number of areas across Kildare and Meath that have been zoned for certain types of development, including a number of business and industrial zones such as Ladytown Business Park between Naas and Newbridge, and a large tourism related zone to the south of Kilcock, where it is proposed to construct an integrated leisure development. All of the main settlements have approved applications for Strategic Housing Developments of more than 100 houses, with some developments up to 400 houses.

The land use within the SAOI is largely agricultural outside of the main settlements; there is one area of commercial peat extraction to the north of Prosperous. All settlements within the SAOI are listed in Section 5.2.2, categorised as large, medium or small towns and illustrated on map 32108AE-MAP-008.

The greatest proportion of land use in the SAOI is for agriculture, with most of this being for pasture (69%). Despite this, only a small percentage of the population (approximately 4%) is employed in the farming business. County development plans are encouraging local farms to diversify into more profitable agri-businesses such as agri-food and horticulture.

There is a large number of equestrian centres and stud farms in the SAOI; the size and nature of these stud farms and equestrian centres vary, some are of national significance.

Tourism

There are a number of important tourism venues in the SAOI, including castles, racecourses, golf clubs and equestrian centres. All of these venues are important for the economy of the SAOI and more widely as many are used in connection with trips to Dublin or elsewhere in Ireland. Others are international venues in their own right, such as the K Club.

Traffic and Transport

The SAOI is situated in a strategic transport gateway, with road and rail networks providing access to and from Dublin and the south and west of Ireland. from There are two motorways and numerous national and regional roads within the SAOI, see map 32108AE-MAP-008. There is an upgrade to the M7, including a bypass of Sallins, currently under construction and an upgrade on the M4 from Maynooth to Leixlip planned; no other road schemes are in the pipeline for the SAOI. The Dublin to Limerick and Dublin to Cork rail lines also cross the SAOI and are likely subject to upgrades in the medium term.

Kildare's CDP reports that many residents of the county commute for employment. A small majority of 60% of those in employment work within the county; of the 40% who travel outside of the county to their job, most (72%) commute to work in Dublin (Dublin City Centre South Dublin, Fingal, Dun Laoghaire Rathdown and Meath). Within the county, there is a significant level of commuting into the north-eastern part where there is a concentration of major employers. Other commuting routes include connections to adjacent towns such as Carlow and Portlaoise in the south of the county. Commuting patterns in Kildare rely heavily on private car transport.

Utilities

Above ground utilities in the SAOI include telephone network cables and OHLs. Near to woodland, there is the existing Moneypoint to Woodland 400kV OHL travelling east to west; the Woodland to Maynooth 220kV OHL travelling north to south; and a 100kV OHL crossing to the south of Woodland substation in a north west to south east direction. There are a number of 220kV OHLs connecting into Maynooth substation in addition to the Gorman -Maynooth and Woodland-Maynooth OHLs; and three further110kV OHLs cross under the 220kV OHL within the SAOI travelling into the greater Dublin area. At Dunstown substation, there is the existing Moneypoint to Dunstown 400kV OHL, two additional 220kV OHLs, which leave Dunstown and travel south and a third travels east.

In addition to these, there are many 38kV and lower voltage OHLs criss-crossing the SAOI.

There are likely to be a number of underground utilities in the regional road network between Woodland and Dunstown, including other electricity cables; telephone and broadband cables; sewers; and private water supplies.

Stakeholders and Engagement for CP 966

Step 1 and Step 2 Engagement

EirGrid has carried out targeted engagement with specific stakeholders and a pubic consultation on the options identified in Step 2 of the project. This has included publishing the Step 1 Needs Report[i]; the Part A[ii] and Part B[iii] Options Reports; and Project Brochures in Autumn 2018 and Spring 2019, the first of which launched the public consultation and the second provided feedback on the consultation and set out next steps.

Identification of Stakeholders for Step 3

A provisional list of stakeholders is identified for CP 966 Step 3, following consideration of the potential social impacts and existing EirGrid stakeholder categories. The key stakeholder categories for the project are considered to be Communities, including travelling communities; Regional and Local Government; Industry and commerce; Governmental departments; Infrastructure organisations (rail, road, water etc); Local suppliers; Regulatory agencies; and Special Interest Groups and NGOs.

Summary of Assessments of Technological Solutions

The appraisal of each of the technologies is summarised in Table 9.1. From a social perspective, the highest risk technology is Technology 3, the UGC; specifically, Option 3C, the 400kV two conductors per phase option. This presents the highest risk to the greatest number of social aspects. This risk is during construction only, but the construction phase would be for a minimum of three years. Technologies 1 and 2 present a similar risk to social impacts during construction; Technology 2 would have a higher impact on amenity and health during operation than Technology 1.

Options Assessment Summary

Topic	Technology 1					Technology 2		Technology 3		
	Up-voltage	1A	1B	1C		New OHL		3A	3B	3C
Amenity & Health										
Economy										
Traffic & Transport										
Utilities										
Summary										

1. Introduction

1.1 What is Capital Project 966?

Capital Project 966 (CP 966) is a proposed development that will help transfer electricity to the east of the country and distribute it within the network in Meath, Kildare and Dublin. The project will help meet the growing demand for electricity in the east. This growth is due to increased economic activity and the planned connection of new data centres in the region. A significant number of Ireland's electricity generators are located in the south and south west. This is where many wind farms and some modern, conventional generators are located. This power needs to be transported to where it is needed.

The power is mainly transported cross-country on the two existing 400 kV lines from the Moneypoint station in Clare to the Dunstown substation in Kildare and Woodland substation in Meath. Transporting large amounts of electricity on these 400 kV lines could cause problems that would affect the security of electricity supply throughout Ireland, particularly if one of the lines is lost unexpectedly.

To solve this emerging issue, EirGrid needs to strengthen the electricity network between Dunstown and Woodland to avoid capacity and voltage problems.

Capital Project 966 aims to strengthen the transmission network between Dunstown and Woodland substations - and suggests a number of technical solutions to do so.

1.2 Framework for Grid Development Explained

EirGrid follows a six-step approach when they develop and implement the best performing solution option to any identified transmission network problem. This six-step approach is described in the document 'Have Your Say' published on EirGrid's website[1]. The six steps are shown on a high-level in Figure 1.1. Each step has a distinct purpose with defined deliverables and represents a lifecycle of a development from conception through to implementation and energisation.

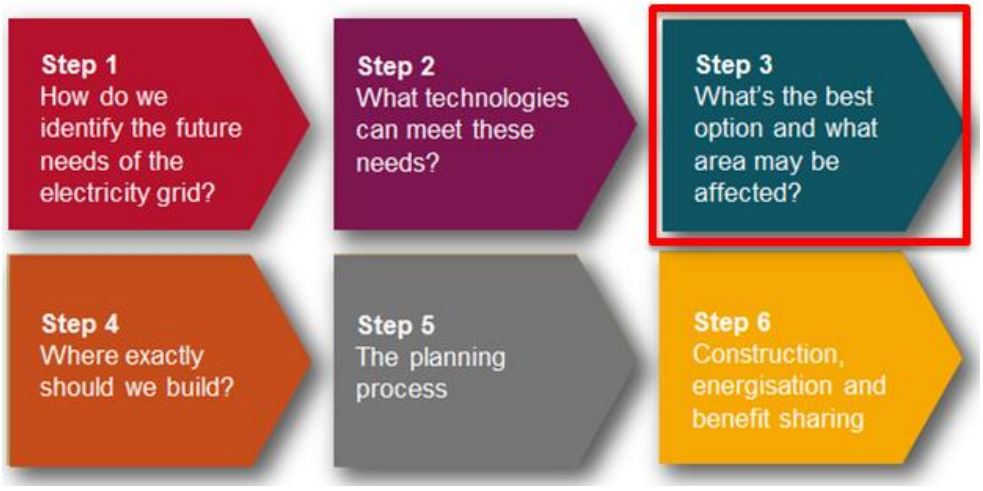


Figure 1.1 EirGrid's six-Step Framework for Grid Development

Capital Project 966 is in Step 3 of the above process. The aim of Step 3 is to identify a best preforming solution to the need identified. There are four remaining technical viable options to be investigated in Step 3.

[1] http://www.eirgridgroup.com/the-grid/have-your-say/

All options create a connection between Woodland and Dunstown substations and have common reinforcements associated in relation to voltage support devices and 110 kV uprates. The main four options are:

- Up-voltage existing 220 kV circuits to 400 kV to create new Dunstown – Woodland 400 kV Overhead Line (OHL);
- A new 400 kV OHL;
- A new 220 kV Underground Cable (UGC); and
- A new 400 kV UGC.

Common reinforcements to all four options (outcome of Step 2, may change in Step 3):

- Uprating of the Bracklone – Portlaoise 110 kV overhead line; and
- Dynamic reactive support device in greater Dublin area rated at approximately ±250 MVAr.

These options will be evaluated against five criteria: technical, economic, environmental, deliverability and socio-economic and each criterion incorporates a number of sub-criteria. It shall be noted that the overall assessment is carried out by EirGrid, but certain aspects are investigated and assessed by various consultants and their assessment will feed into the overall assessment.

In this report, because of common constraints relating to the two underground cable options, the options are considered as three different technologies: up-voltage; new overhead line; and new underground cable. Then options are considered within those technologies, as appropriate. Further details are provided in Section 2 of this report.

1.3 Aims and Contents of the Strategic Social Impact Scoping Report

EirGrid has engaged Jacobs to assess the social issues and potential impacts that should be taken into account for CP 966. This report is aimed at presenting the findings of this investigation. The findings will feed into EirGrid's overall evaluation of the three technologies.

In particular, the purpose of this report is to:

- Identify the social criteria that are most likely to be affected by the construction and energisation of EirGrid's best performing technologies, using the study areas defined in the Environmental Constraints Report (Document 32108AE-REP-002), with reference to the Step 2 SIA report for CP 966, and the outcome of the stakeholder engagement process, (see Sections 3 and 4);
- Update the Social Area of Influence Baseline from Step 2 (See Section 5);
- Identify the principal social issues and impacts likely to arise during the construction or operation of each of the technological solutions (See Sections 6 to 8); and
- Summarise, evaluate and compare the constraints applicable to each of the technological solutions (See Section 9).

1.4 Social Multi-Criteria Assessment

This report describes the social issues and potential impacts within the study area(s) and includes a Multi-Criteria Assessment (MCA) of social criteria in the context of each technical solution. This will be combined with findings from the feasibility studies, environmental constraints report and other investigations and feed into a wider MCA being undertaken by EirGrid to identify the best performing technical solution(s).

1.4.1 Scale Used to Assess each Criterion

The effect on each criterion parameter is presented along a range from “more significant”/”more difficult”/“more risk” to “less significant”/”less difficult”/“less risk”.

The following scale is used to illustrate each criterion parameter:

More significant/difficult/risk Less significant/difficult/risk

This risk scale is clarified by text, as follows:

- High: dark blue;
- Moderate-high: blue;
- Moderate: dark green;
- Low-moderate: green; and
- Low: cream.

1.4.2 Topics (Criteria) for use in the Assessment

To address the identified potential social impacts, some of which overlap with each other, and consider the issues raised at Step 2, and to take account of the approach and findings of the environmental Constraints report, a new set of ‘Assessment Topics’ was derived for the SIA.

The following topics have been identified through review of the Step 2 SIA Baseline Report and the Step 3 Environmental Constraints Report.

- Amenity & Health;
- Economy;
- Traffic & transport; and
- Utilities.

A broad description of these topics, including relevant legislation is provided in Section 3 of this report; an updated Social Area of Influence (SAOI) is provided for each technology in Section 5; and the baseline within the SAOI for each technological solution, is provided in Sections 6 to 9. Other criteria such as Land Use and Cultural Heritage are assessed in 321084AE-REP-002 Environmental Constraints Report.

1.5 Relationship to Other Technical Reports

Parallel to this report, technical studies are being prepared to investigate the feasibility of the options. In addition, an Environmental Constraints Report has been prepared.

Please read in conjunction with the following reports:

- 32108AE-REP-001 CP966 Cable Route Feasibility Report;
- 321084AE-REP-002 – CP966 Environmental Constraints Report; and
- 321084AE-REP-004 to 12 – CP966 Technical Requirements Feasibility Reports.

This report (CP966 Strategic Social Impact Assessment Scoping Report) has the reference 32108AE-REP-003.

1.6 Social Impact Assessment Methodology

1.6.1 Overview of EirGrid SIA methodology

This report follows the methodology for Social Impact assessment as outlined in EirGrid's 'Draft Methodology for Social Impact Assessment (SIA)'[iv], which was based upon guidance for SIA issued by the International Association for Impact Assessment (IAIA) in 2015[v] . The IAIA Guidance describes SIA as:

The process of identifying and managing the social issues of project development and includes the effective engagement of local communities in participatory processes if identification, assessment and management of social impacts.

EirGrid developed its methodology for SIA to provide a consistent format in assessing the potential social impacts of grid developments, irrespective of the scale and complexity of a project. It uses the terminology, format and structure of the Framework for Grid Development and was developed in reference to the six steps of the Framework; in this way, there is early demonstrable consideration of social impact in the development of a project in all six steps.

Different levels of SIA may be required at different Steps of the Framework, the EirGrid methodology outlines the approach at each step as follows:

- **Step 1 - Gathering of Issues of Potential Social Impact:** to provide a high level, early understanding of potential social issues regarding the future needs of the electricity grid;
- **Step 2 - Early Baselining and Screening for SIA**; SIA is conducted within a defined Social Area of Influence (SAOI) boundary, which consists largely of the people potentially impacted by the project, namely, local 'communities of place' and broader 'communities of interest; the SAOI is defined within Step 2 and within this geographical area, baseline conditions are identified and presented in a Social Baseline Report. This report includes a Screening of the potential for social impact of the shortlist of technology options. This will inform the multi-criteria decision-making analysis that will identify the preliminary preferred solution options;
- **Step 3 - Further Baselining and Strategic SIA Scoping:** early preparation of an initial Strategic SIA Scoping Report of the shortlisted technology solution options, which is updated to inform the decision-making in respect of the preferred technology option;
- **Step 4 – Social Impact Appraisal:** following a final iteration of the SIA Scoping Report in respect of solutions to meet the preferred technology solution, appraising potential social issues and risks (including the potential for mitigation of those issues) of the identified project solution (site/route options);
- **Step 5 – Social Impact Assessment:** Depending upon the anticipated significance of social impact, formal Assessment of the project proposal will occur by way of a Statement of Social Impact, a Social Impact Report, or a Social Impact Assessment for the project; and,
- **Step 6 - Mitigation and management** of social impacts will be conducted on projects as may be provided for in the SIA, primarily using the ALO and CLO networks, to develop and maintain long term, positive community/ social relationships. This will also include reporting of social oversight of construction. It may include implementation of any Management Plan. It may also include measuring and monitoring of the ongoing social performance of EirGrid's projects, to provide transparency and learnings for future projects.

Figure 1.5 gives an overview of the SIA process – alongside the steps of the Framework.

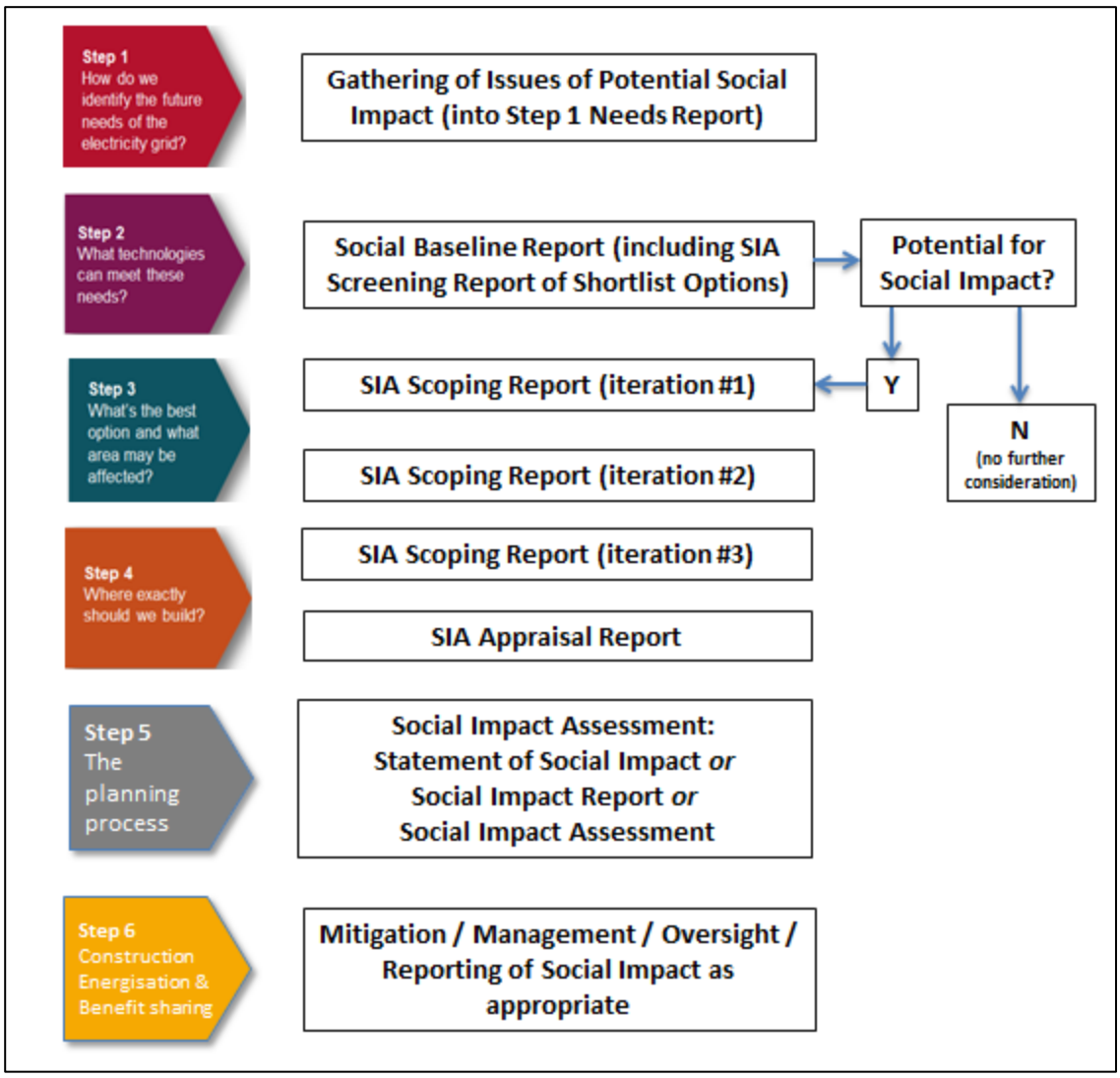


Figure 1.2 Overview of SIA Process

The methodology sets out the approach to SIA in Step 3; here there is a continuation of baseline studies from Step 2, as additional or more local information is included in respect of the social profile of the SAOI of the identified shortlisted technology options.

This Step includes preparation of an initial Strategic Social Impact Scoping Report (this report), which will capture the main information gathered and present an early conclusion as to the potential impacts of the project and anticipated approach to SIA. The initial Scoping Report will be revisited towards the end of the Step, following stakeholder engagement and public consultation.

Specific tasks within Step 3 are:

- Refine SAOI based on shortlisted technology options (See Section 6);
- Update Social Baseline Report within refined SAOI (See Sections 6 to 9);
- Initial (first iteration) Strategic SIA Scoping Report (this report);
- Participative Public Consultation within SAOI (to follow publication of this report); and
- Update (second iteration) Strategic SIA report to take account of any feedback from public consultation

1.6.2 Approach to SIA in this Report

This report provides an update to the social baseline, using an updated study area to define the boundaries of the new SAOI for the project. As already outlined, this report considers the three broad types of technological solution and details within each type as appropriate, rather than options,

Topics considered in the social baseline have been determined following a review of the Step 2 Baseline report; identification of the potential social impacts of the project; and consideration of the potential issues of likely stakeholders. A broad list of stakeholders is identified in Section 5. This follows a review of EirGrid's stakeholder engagement plan, the identification of potential social impacts arising from the project and review of the Project Stakeholder Plan.

1.6.3 Data Sources

A number of data sources were used in the preparation of this report, as follows:

- 32108AE-REP-001 CP966 Cable Feasibility Report;
- 32108AE-REP-002 CP966 Environmental Constraints Report;
- 32108AE-REP-009 CP966 Woodland Turn-In Feasibility Report
- Census 2016 Data, Central Statistical Office (CSO.ie) at county, small area* and settlement geographical levels;
- National datasets from Prime 2 (Ordnance Survey Ireland's central database of spatial information; and
- County Development Plans for Kildare and Meath CCs.

*Small Areas are areas of population generally comprising between 80 and 120 dwellings created by The National Institute of Regional and Spatial Analysis (NIRSA) on behalf of the Ordnance Survey Ireland (OSi) in consultation with CSO. Small Areas were designed as the lowest level of geography for the compilation of statistics in line with data protection and generally comprise either complete or part of townlands or neighbourhoods. The small area boundaries have been amended in line with population data from Census 2016.

2. The Project

2.1 Technological Solutions Being Considered

The technological solutions being considered in this report are:

- Technology 1: Up-voltage– 220 kV OHL circuits to 400 kV circuits (Gorman - Maynooth – Dunstown);
- Technology 2: New 400 kV OHL;
- Technology 3: New Under Ground Cable (UGC):
  - Option 3A: 220kV UGC (12m cable swathe);
  - Option 3B: 400kV UGC (one conductor per phase; single 12m cable swathe);
  - Option 3C: 400kV UGC (two conductors per phase):
    - Sub Option 3Ci: two conductors in a single 24m swathe;
    - Sub Option 3Cii: two conductors in two separate 12m swathes.

Note: Sub Option 3Ci has been ruled as not feasible in the Cable Feasibility Report (Ref) and so will not be considered in this assessment.

All of these technological solutions would meet the project objective of reinforcing the transmission network in Kildare, Meath and Dublin to support economic growth and a rising population albeit with different performance in various aspects.

Further details for each of these options are provided in Sections 5 to 7 of this report, where each technology is considered consecutively.

Common reinforcements to all four options (outcome of Step 2, may change in Step 3):

- Uprating of the Bracklone – Portlaoise 110 kV overhead line; and
- Dynamic reactive support device in greater Dublin area rated at approximately ±250 MVAr.

2.2 Study Areas

The Project Study Area is defined as the area investigated for the possible installation of any of the technologies identified in Step 2.

Figure 2.1 shows the Project Study Area for CP 966. The study area selected will provide a high likelihood that all technologies can be feasibly accommodated with it. It should be understood that this study area will be used for Technologies 2 and 3; however, Technology 1, the up-voltage of 220kV to 400kV could be more refined as the 220kV route is an existing OHL. Details of the Technology 1 Study Area are provided in Section 5 of this report.

2.3 Development of Study Area

The study area identified in Step 2 was used as a basis of the development of a study area. As part of this Step of the project (Step 3), the Project Study Area has been further refined by considering a wide variety of factors. These included technical requirements of the project, road network presence, settlements, presence of existing electrical utilities, physical constraints e.g. motorway, river or rail crossings and some environmental constraints. In particular, the Project Study Area has been confined to the west by peatlands and likely difficulties with construction and environmental protection in these areas and to the east by the western edge of the conurbations surrounding Dublin.

The current Project Study Area is smaller than the Step 2 Study Area but is still large enough for the examination of feasible options for the project. In addition, the Project Study Area is not precisely congruent with the assessment Study Area, which has some flexibility in terms of potential social impact and constraints; where a wider perspective is often needed, for example in terms of amenity or travel to work times.

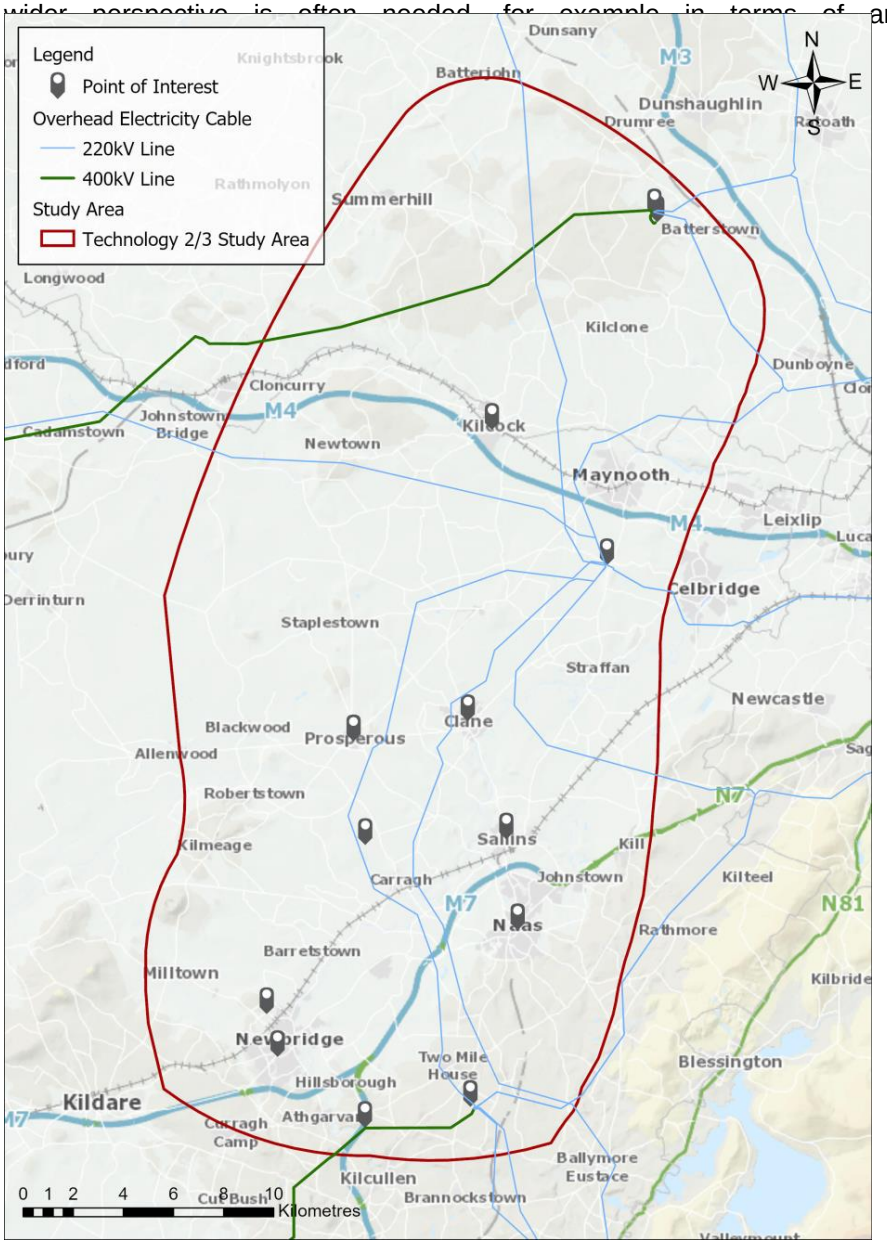


Figure 2.1 CP 966 Project Study Area at Step 3

This broad Project Study area is used for Technologies 2 and 3; however, Technology 1, the up-voltage of 220kV to 400kV is more refined as the route is already known. Details of the study area for Technology 1 are provided in Section 5 of this report.

3. Social Impacts

3.1 Potential Social Impacts

Based on guidance from the IAIA and EirGrid's SIA methodology, Social Impact can be considered as changes to one or more of the following:

- People's way of life – how they live, work and interact;
- Their culture – shared beliefs, customs, values and language;
- Their community – cohesion, stability, character and facilities;
- Their political systems – participation in decision-making, level of democratisation, resources available for this etc. Their environment – quality of water, air, food etc.; level of emissions they are exposed to; adequacy of sanitation; physical safety etc.
- Their health and wellbeing – physical, mental, spiritual etc.
- Their personal and property rights – economics, disadvantage etc; and
- Their fears and aspirations – perceptions of safety; fears for the future of the community; aspirations for their future and the future of their children.

In addition to this, other social impacts (beneficial and adverse) include:

- Reinforcement of the transmission network;
- Safeguarding supply to large industries;
- Construction contract including Construction jobs, accommodation and spend during the construction phase;
- Disruption to commercial organisations during construction;
- Disruption to travel and transport infrastructure during construction; and
- Disruption to 3rd party utilities.

3.2 Review of Step 2 Baseline

The Step 2 Baseline Report sets out a high-level baseline, from which certain issues arise, based around the following categories:

- Settlements: High levels of urbanisation and a predicted population growth in the SAOI;
- Commercial and Industry: Proximity of the technical solution to commercial and industrial space;
- Agriculture: Large swathes of agriculture, including large commercial operations to the east of the SAOI;
- Equine: several equestrian operations and racecourses in the SAOI;
- Tourism and Recreation: several demesne country house hotels with golf course, a number of golf courses and scenic natural assets such as the Grand Canal, the Royal Canal and the Liffey valley.
- Transport and Movement: the strategic importance of this area as a gateway to Dublin from the south and west of Ireland, including motorway and rail links;
- Planning History: other energy infrastructure projects in the area which have raised public concern; and
- Natural and Built Environment: the presence of designated biodiversity sites within the SAOI and the need for environmental constraints mapping as a next step.

3.3 Assessment Topics

3.3.1 Overview

This section of the report introduces the social issues that have been considered and organises them under particular topics, as set out in Section 1.4, to aid understanding and presentation of the assessment findings. These topics have been selected as they are the most likely to represent the key considerations, constraints, risks and opportunities for the project.

- Amenity: Here 'amenity' is the term used to describe the overall pleasantness or attractiveness of surroundings. This includes effects on local communities, community facilities, local businesses and recreation and tourism assets. This builds on the work in the Environmental Constraints report.
- Health: to determine potential effects on humans, this considers amenity effects as well as considering WHO health thresholds; EMF is considered as set out in EirGrid's Guidelines
- Economy: effects on the national, regional and local economy;
- Traffic & transport: this considers potential effects on traffic and transport in the study area, during the construction phases of the different solutions. Of concern to communities is the potential for severance, isolation and significant delays during the construction phase. Also considered in this topic are potential effects on the crossings of major roads, railways and navigable waterways if relevant; and
- Utilities: consideration of third-party assets, including telecommunications and aviation.

Where available, the national picture for Ireland is presented in this section to give the overall context for the choice of the issues and associated topic; Sections 6 to 8 describe the baselines for each topic in relation to the technical solution study areas, consider the key issues and present a high-level assessment of the performance of each technology (and options where applicable) for each topic, using EirGrid's MCA colour codes to illustrate the findings.

3.3.2 Amenity and Health

Amenity

There is no 'national picture' for amenity as it is a local issue. Detrimental effects on amenity are generally considered to arise where 'nuisance' impacts coincide in an area or on people and places. The 'nuisance' constraints included here relate to: views; traffic and transport; air quality; and noise. The purpose of considering the 'nuisance' constraints is to recognise and assess how the technological solutions perform against amenity but also as individual topics in respect of people's health and wellbeing.

For commercial and tourism sites, amenity impacts can occur as a result of just one of the effects. For example, a visual effect could have a secondary effect on the operation of the tourism business, potentially resulting in a loss of trade. The impacts can occur during construction of a development as well as during its operation. These are considered under the Economy Topic.

In considering the amenity constraints, the focus is on communities which includes effects resulting in a change in how people perceive their communities, or how they use community facilities such as schools, hospitals and places of worship. Other local facilities such as shops, banks, pubs and restaurants are considered. The assessment of community amenity acts as a proxy for the assessment of effects on all those living, working, visiting or travelling through the area. This assessment also considers the potential effects as a result of isolation, following the severance of commonly used routes, if applicable.

Health

The Healthy Ireland Framework 2013-2025 is a roadmap for building a healthier Ireland. It is based around four key goals:

- to increase the proportion of people who are healthy at all stages of life;
- to reduce health inequalities;
- to protect the public from threats to health and wellbeing; and
- to create an environment where every individual and sector of society can play their part in achieving a healthy Ireland.

In April 2019, Ireland had a population of 4.92 million people. This represents an 15% increase since 2006. The national population is growing as a result of net migration and a sustained natural increase. People living in Ireland are now living longer than ever before, but not all are living those longer lives in good health.

The percentage of the population that reported their general health to be either good or very good was 86% in 2015. This is a fall from the 2011 figure of 88%. After a fall in the levels between 2011 and 2012, the percentage of those aged 16 and over that rate their health as good or very good has increased each year.

The expected number of healthy life years for a person born in Ireland in 2015 is 67.3. This is an improvement on 2014 which was 66.9. There has been an upward trend in the number of healthy life years since 2006. However, good health is not evenly distributed in society, with prevalence of chronic conditions and accompanying lifestyle behaviours being strongly influenced by socio-economic status, levels of education, employment and housing. A key goal in the Healthy Ireland Framework is to reduce these inequalities, for example, to reduce the gap in healthy life expectancy at age 65 between the highest and lowest socio-economic groups.

This report considers how health could be affected by the proposed technical solutions, in relation to amenity, emissions and concerns relating to EMFs.

Noise Emissions

The Noise Directive (2002/49/EC), relating to the assessment and management of environmental noise, was transposed into Irish law via the Environmental Noise Regulations 2006 (S.I. No. 140 of 2006). This Directive called for the development of strategic noise maps and action plans for major roads, railways, airports and cities. To date, these have been produced for the road network only.

The relevant planning authorities are required to prepare noise action plans designed as a means of managing land use planning, traffic management and control of noise sources. The EPA published guidance for local authorities on the content of the plans and Kildare published their Noise Action Plan 2019 – 2023 in September 2019. Meath County Council have published their Draft Noise Action Plan for Consultation in June 2018.

Air Quality Emissions

Ireland's air quality is generally good in comparison to other EU member states, largely down to the prevailing Atlantic air flow and the absence of large cities and heavy industries. Ireland's air quality standards are dictated by the EU Cleaner Air for Europe (CAFE) Directive (2008/50/EC). The EPA is responsible for monitoring the nation's levels of air pollutants within four zones as follows:

- Zone A: Dublin;
- Zone B: Cork;
- Zone C: Other cities and large towns in Ireland; and
- Zone D: Rural Ireland.

According to the most recent Air Quality in Ireland report, Ireland has not exceeded EU limits on air quality in recent years. However, there have been exceedances of the more stringent air quality indicators devised by the World Health Organization. In the State of the Environment Report, the EPA (2016) and World Health

Organization estimated 1,200 premature deaths are attributable to poor air quality in Ireland annually, and therefore the EPA recognises the importance of the World Health Organisations more stringent limits.

Nitrogen Oxide (NOx) is the collective term for the gases nitric oxide (NO) and nitrogen dioxide (NO_2). Emissions from traffic are the main source of nitrogen oxides (NOx) in Ireland, along with electricity generating stations and industry[vi].

Electric and Magnetic Fields (EMF)

Electric and Magnetic (Electromagnetic) Fields (EMF) together with optical radiation, which includes infrared (IR), visible light (and laser), and ultraviolet radiation, collectively make up the non-ionising radiation (NIR) spectrum. This type of radiation does not have enough energy to break up (ionise) atoms or molecules. It is therefore different to ionising radiation such as X-rays or radioactive substances, that can break up molecules and is known to cause damage to human cells.

EMF are generated by a number of man-made sources including everyday items such as mobile phones and electrical appliances; when electricity is produced and distributed; and there are also natural sources such as the earth's magnetic field and the sun.

EirGrid has published a series of evidence Based studies relating to the potential environmental effects of the transmission network; one of these is for EMF[vii].

This study (2014) took the form of a literature review of the extremely low frequency (ELF) EMF health evidence base, and consideration of measurements taken of EMF from high-voltage electricity transmission infrastructure in Ireland during 2012-2013, with the combined objective of informing future grid infrastructure planning and more effectively addressing commonly raised community health concerns.

The review explored a range of possible health effects from ELF EMF on human health; core documents on the topic published by international organisations including the World Health Organisation (WHO) show that the evidence for an association between ELF EMF exposure and carcinogenic effects, particularly leukaemia, is limited; however, the research does not rule in or out the possibility of a causal link.

As a precautionary approach, public exposure guidelines have been set by an independent body, the International Commission on Non-Ionizing Radiation Protection (ICNIRP). It is considered appropriate by health protection bodies to remain within guidelines set to manage known health risks and where possible to further reduce unnecessary exposure.

For EirGrid's study, measurements of EMF undertaken during 2012-13 were taken from single and double circuit OHLs at 110kV, 220kV and 400kV, transformer substations at these voltages, and UGCs at 110 kV and 220 kV. The measurement results were compared to the ICNIRP guidelines 'reference levels' of 5kV/m for electric fields and 200 microteslas (µT) for magnetic fields and discussed along with the underpinning health evidence base in the literature review section.

- UGCs produce no electric field above ground;
- The maximum electric field strength measured at all OHLs and substation perimeters surveyed was just below the ICNIRP reference level, however, points to note:
    - the ICNIRP reference level, this reference level is set on a highly conservative basis that ensures that the ICNIRP basic restriction for electric field exposure cannot be exceeded by external field strengths below the reference level.
    - For a 400kV single circuit OHL is close to the ICNRP's reference level directly under the OHL, there is a dramatically decreasing level of electric field with increasing distances from OHLs.
- The maximum magnetic field strength recorded among the overhead power lines was well below the 2010 ICNIRP guideline reference level for general public exposure.
- As with electric fields, the magnetic field strength recorded for all types of overhead power lines and underground power cables under all load conditions falls rapidly with distance from their centrelines.

Notwithstanding these findings, EMFs remain a issue of concern for local communities To allay people's fears, as far as is reasonably practicable, any new circuits will be routed so as to be further than 50m from residential properties.

3.3.3 Economy

Industry, Commerce and employment

National Economy

Ireland's strategy for its economy is woven through its Project Ireland 2040 process and key objectives which are:

- Compact growth;
- Enhanced regional accessibility;
- Strengthened rural economies and communities;
- Sustainable mobility;
- A string economy supported by enterprise, innovation and skills;
- High quality international connectivity;
- Enhanced amenity and heritage;
- Transition to a low-carbon society and climate resilient society;
- Sustainable management of water, waste and other environmental resources; and
- Access to quality childcare, education and health services.

Key economic indicators for Ireland are published on a quarterly basis and show that, in the 12 months up to Q4 2019:

- GDP increased by 5.5%;
- Industrial production rose by 0.4% (Data January 2020)
- Numbers in employment rose by 3.5%;
- Unemployment rate decreased by 4.0% (Data February 2020); and
- Average weekly earnings rose by 3.5%.

The assessment looks at the potential impacts on the wider economy of the SAOI through consideration of the effects of construction workers, accommodation and direct and indirect local supply chain expenditure.

Land Use, Agriculture and Equine

Land Use

Key economic indicators for Ireland are published on a quarterly basis and show that, in the 12 months up to Q4 2019:

- Number of new homes built increased by 37.8%
- Land use across Ireland remained dominated by grassland in 2017 at 58.5%, wetlands were 17% and forestry 11%; settlements accounted for just 1.7% of land use.

Agriculture

Key economic indicators for Ireland are published on a quarterly basis and show that, in the 12 months up to Q4 2019:

- Agricultural output decreased by 1.3%

The Census of Agriculture in Ireland was carried out in 2010 and a Farm Structure survey carried out in 2016. Key indicators are:

- 2016 there were 137,500 farms compared to 139,860 in 2010;
- Average farm size was 32.4 ha in 2016 compared to 31.4ha in 2010;
- Total agricultural area in 2016 was 4.5m ha which accounted for approximately 63% of land use in Ireland; and
- In terms of farm types, specialist beef production was the most dominant with over 55% of farms classified in this way.

Equine

In terms of agricultural output, the Output and Input estimate for agriculture in Ireland for 2018 estimated the value of horse livestock was €306.4m; this compares to value of cattle being €2,200m.

The Department of Agriculture, Food and Marine in 2018[viii] reported that the Irish Equine Industry's contribution to the national economy was €816m, an increase in 15% compared to a similar report in 2012. The industry also provided 14,000 jobs in sport horse breeding, competition and leisure sectors. Breeding is the largest contributor, with over 14,800 active breeders it accounted for €271m expenditure in the economy.

In 2017 there was an estimated 92,300 horses in Ireland; Dublin and the mid-East region accounted for almost 18% of these, which was second only to the West region which had 19% of the total population.

Tourism

Recreational Facilities include facilities that are intended to make life more pleasant or comfortable to people in a community. These may include but are not limited to leisure centres, sports clubs, gyms, local parks and golf courses. Tourist attractions are facilities which attract those from outside the community to visit the area. Effects on sites or assets that could disrupt the use or function of the receptor because of specific, or a combination of, amenity effects.

Tourism is Ireland's largest indigenous industry employing 230,000 people nationally, one in every ten of the labour-force. It is twice the size of agriculture and far bigger in employment than the construction industry, the IT industry, or the financial services sector.

In 2018, out-of-state (Overseas and North Ireland) tourist expenditure amounted to €5.6 billion. With a further €1.7 billion spent by overseas visitors on fares to Irish carriers, foreign exchange earnings were €7.4 billion. Domestic tourism expenditure amounted to €2 billion, making tourism a €9.4 billion industry.

Before allowing for receipts paid to Irish air and sea carriers by overseas tourists, the government earned estimated revenue of €1.8 billion through taxation of tourism. This grows to €2.2 billion when carrier receipts are factored into the analysis, of which €1.7 billion came from out-of-state tourism and the balance from domestic tourism. In 2018 the tourism industry accounted for 4.0% of all tax revenue (source www.failteireland.ie).

In 2018, almost 11 million people visited Ireland and the tourism industry employed an estimated 260,000 people.

Many of these visitors spent time, and money in the SAOI for this project and so consideration of tourism and the potential effects of the project upon it are included within the Amenity and Health assessments and where appropriate in the economic assessment.

3.3.4 Traffic & Transport

Ireland's transport policy is described by the Department of Transport, Tourism and Sport as being '*centred around the efficient movement of people and ensuring increased accessibility to all passengers using the transport network*' [ix].

Ireland's policies relating to transport focus on Public Transport, Roads, Aviation, Maritime and Climate Change. The Irish Government has pledged investment of €19.7bn in roads and public transport in line with the National Development Plan (2018-2027)[x] and Project Ireland[xi].

There are 5306 km of national roads in Ireland and 916 km of motorway.

In addition to national roads and motorways, Ireland also has an extensive network of other public roads; in 2018 there were:

- 13,124 km of Regional Roads; and
- 81,300 km of Local Roads (three classes):
  - Local Primary 23,789km;
  - Local Secondary 33,366km; and
  - Local Tertiary 23,789km.

As can be seen from these numbers, the vast majority of roads in Ireland are Local Roads; many of these roads are narrow (not greater than 4m in width).

By 2040 the population of Ireland is estimated to grow by over 1 million to 5.7 million people. In 2017 transport accounted for 19.8% of Ireland's greenhouse gases and contributes to poor local air quality (see the Air Quality section of this report). The Climate Action Plan 2019[xii] identifies specific goals for Ireland including:

- *developing the electric vehicle network to sustain at least 800,000 cars by 2030;*
- *banning cars powered by fossil fuels by 2030 and stop granting National Car Tests (NCT) by 2045;*
- *a move towards the electrification of Ireland's public bus fleet;*
- *expanding the LUAS network; and*
- *expanding the national cycle network as set out in the National Cycle Policy Framework*[xiii]

3.3.5 Utilities

This includes a variety of types of infrastructure which may be affected by the project. In particular, third party utilities which may be overhead (other electricity lines or telephone lines), underground (electricity cables, water, sewers, gas, fibre optic cables) are considered. In addition, aviation and telecommunication systems are important considerations for OHLs and UGCs in terms of effects from Electromagnetic Fields.

There is no national level policy that covers all of these utilities, and no national statistic which a reasonable representation of each would be. As such, this topic is addressed within the technological solutions assessment in this report only.

4. Stakeholder Review

4.1 EirGrid Stakeholder Engagement Plan

In 2020 EirGrid published its draft plans for stakeholder engagement through its Stakeholder Engagement Plan[2], which sets out its engagement principles, key stakeholders and how these stakeholders are engaged with.

4.1.1 Engagement Principles

Within the Stakeholder Engagement Plan EirGrid set out general principles for engagement for all projects which are as follows and illustrated in **Error! Reference source not found.**:

We will communicate clearly with stakeholders, including plain English summaries of proposals and other relevant documents.

- *We will allow enough time for stakeholders to consider the information we have given – and to give us their views.*
- *Anybody who wishes to respond will be able to do so.*
- *We will offer clear opportunities to engage with us.*
- *We will explain the decisions we need to make – and the timelines.*
- *We will communicate with all stakeholders who have taken the time to engage with us. We will explain how their feedback shaped our eventual decision or approach.*

These principles are applied to our engagement with all our stakeholders and form the basis of all engagement with industry, customers and members of the public.

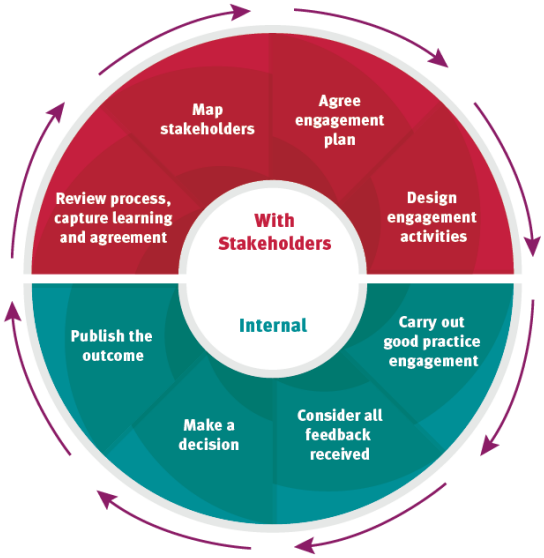


Figure 4.1 EirGrid Stakeholder Engagement Principles

4.1.2 EirGrid Stakeholders

EirGrid's follows the same approach to identification of stakeholders for each project, to ensure consistency and the application of its engagement principles. In order to identify them, the following questions are asked:

[2] http://www.eirgridgroup.com/site-files/library/EirGrid/EirGrid-Stakeholder-Engagement-Report-2020.pdf

- *Why is this needed? Before we engage with stakeholders, we ensure that the reasons for the engagement are clear, such as why this particular grid development is required or why a change to how we operate the grid is required.*
- *Who might this affect? For example, communities affected by grid development, or customers affected by changes to the operating environment.*
- *Who may have a particular interest in it?*
- *What decisions do we need to make? When and how could the stakeholders we talk to influence these decisions?*
- *What are the best ways to involve stakeholders who we may affect, or groups with an interest in a relevant project/piece of work/issue?*

EirGrid's stakeholders typically include:

- Customers: both direct customers that are connected to the transmission system and either generating or consuming large amounts of energy; and more broadly the end users of the grid system, including homes, businesses, schools and hospitals;
- Landowners and Communities: individual landowners, or companies that own the land; members of local communities, businesses and groups; and local authorities and elected representatives; and,
- Other organisations: businesses, representative organisations and political authorities at all levels; groups interested in issues like the environment, tourism and heritage; and relevant government departments when needed.

Those stakeholders engaged with most frequently by EirGrid are presented in Table 4.1.

Table 4.1 EirGrid Key stakeholders

Stakeholder Group	Examples of Stakeholders
Academics	Universities, ESRI
Chartered Institutions	Engineers Ireland
Communities and their representatives	Communities with major infrastructure projects, planning authorities
Customers	Generators, interconnectors, large energy users, energy suppliers, demand-side aggregators
EirGrid	Board members, employees, trade unions
Energy Industry	ESB Networks, Gas Networks Ireland, Electricity Association of Ireland, Irish Wind Energy Association (IWEA), Demand Response Aggregators of Ireland (DRAI), NOW Ireland, Microgeneration Ireland, Irish Wind Farmers' Association (IWFA), Irish Solar Energy Association (ISEA), Irish Energy Storage Association (IESA), Renewable Energy Ireland.
Environment	National Parks and Wildlife Service
Government Advisory Boards	Climate Change Advisory Council, National Competitiveness Council, NESC, ESRI, Heritage council
Industry Bodies	IDA, IBEC, American Chamber, Chambers Ireland, French Chamber, British-Irish Chambers
Infrastructure	Irish Rail, Transport Infrastructure Ireland
Media	Consumer, Trade, Financial, Broadcasters
NGO	Friends of the Earth, IFA, Fáilte Ireland, Irish Rural Link
Non-political – Europe	ENTSO-E, RGI, European Investment Bank
Political	Taoiseach, Department of Communications, Climate Action and Environment, Department of Business, Enterprise and Innovation, Oireachtas committees

Stakeholder Group	Examples of Stakeholders
Political – Europe	European Commission, European Parliament, French Government
Regulatory	CRU, SEM Committee
Think Tanks	IIEA, EPC, University College Dublin

4.1.3 Tools of Engagement

EirGrid uses its 'Engagement Spectrum' to guide the nature of its engagement with different stakeholders at the various steps in its grid development projects. This is illustrated in Figure 4.2 with examples shown in italics.

Figure 4.2 EirGrid Engagement Spectrum

4.2 Stakeholders and Engagement for CP 966

4.2.1 Step 1 and Step 2 Engagement

EirGrid has carried out targeted engagement with specific stakeholders and a pubic consultation on the options identified in Step 2 of the project. This has included publishing the Step 1 Needs Report[xiv]; the Part A[xv] and Part B[xvi] Options Reports; and Project Brochures in Autumn 2018 and Spring 2019, the first of which launched the public consultation and the second provided feedback on the consultation and set out next steps.

4.2.2 Step 3 Engagement

Along with EirGrid overall Stakeholder Engagement Plan, EirGrid have also drafted a 'Step 3: Engagement Plan for CP 966'. EirGrid's 'Have Your Say' document was used to reflect and build on engagement for Step 3 this plan. As outlined in 'Have Your Say', the purpose of engagement in Step 3 is as follows:

- *To understand any issues of public concern that could affect which option we choose;*
- *To learn more about the local area;*
- *To identify potential issues that could restrict options in the study area;*

- *To decide on a preferred technology for the project, and on the study area where this option could be placed.*

4.2.3 Identification of Stakeholders for Step 3

Following the guidance within the 'Have Your Say' document, Eirgrid considered not only potential interested stakeholders, but also considered the residents of the region, and any particular needs or interests they may have.

EirGrid considered the location, demographics, current local context and diversity and inclusion to help create their potential audience. Stakeholder Mapping was also used to outline the potential stakeholders, their potential influence on and interest in the project. The Stakeholder Mapping, as identified below in Figure 4.3 can be used to inform the choice of methods for stakeholder engagement.

List all the currently known stakeholders, under the suitable quadrant (based on influence and interest) in the table below.

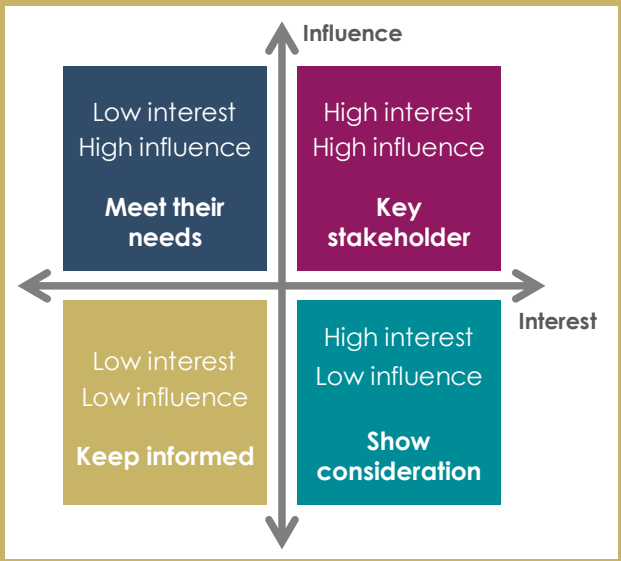


Figure 4.3: Stakeholder Mapping

4.2.4 Approach to engagement

The EirGrid approach to engagement is outlined on pages 2-4 of *Have Your Say: How we develop the electricity grid, and how you can influence our plans*. In summary, this approach recommends:

- *Involving members of the public and stakeholders early in the process so they are more able to influence plans;*
- *Providing information in plain English, online and in paper form;*
- *Providing enough time for people to contribute their views;*
- *Offering clear opportunities for engagement and ways to influence the decision-making process;*
- *Explaining decisions that need to be taken and factors that influence those decisions; and*
- *Communicating with everyone who has taken the time to engage with the project.*

The approach to Stakeholder Mapping allows types of Stakeholders to be identified and from there, specific Stakeholders. See Table 4.2.

Table 4.2 Stakeholders

MEET THEIR NEEDS **Low interest High Influence**	**KEY STAKEHOLDER** **High Interest High Influence**
Industrial Development Agency	Meath County Council
Department of Communications, Climate Action and the Environment	Kildare County Council
MEPs	Equine Industry
Department of Transport	Eastern and Midlands Regional Assembly Office
Chambers Ireland	Councillors
Commission for the Regulation of Utilities	Elected reps
Transport Infrastructure Ireland	Irish Farmers' Association
	ESB Networks
KEEP INFORMED **Low interest Low influence**	**SHOW CONSIDERTION** **High interest Low influence**
Local transport groups	Community/residents groups
Commuters	Campaign Groups
Irish Water	Ratoath Municipal District
Internal stakeholders	Meath/Kildare Chambers of Commerce
	Business Improvement Districts
	Residents
	PPNs
	Enterprise Ireland

5. Social Area of Influence – Baseline

SIA is conducted within a defined Social Area of Influence (SAOI) boundary, which consists largely of the people potentially impacted by the project, namely, local 'communities of place' and broader 'communities of interest.'

5.1 Step 2 SAOI Summary

The outcome of the first part of the options assessment exercise in part A of Step 2 was the refinement of a long list of options to five solution options using three different technologies. The three technologies remain the same as those being considered in Step 3: the new overhead line; a new underground cable; and up-voltage technology.

The five solution options in the refined list at the end of Part A, Step 2 are shown in Table 5.1; these options set the geographical context for the Step 2 SAOI.

Table 5.1 Step 2 Technology Options

Technology	Option	Description
Up-voltage	1	Up-voltage existing 220 kV circuits to 400 kV to create new Dunstown – Woodland 400 kV overhead line (OHL)
New Overhead Line	2A	New Dunstown – Woodland 400 kV overhead line (OHL)
New Overhead Line	2B	New Dunstown – Woodland 220 kV overhead line (OHL)
New Underground Cable	3A	New Dunstown – Woodland 220 kV underground cable (UGC)
New Underground Cable	3B	New Dunstown – Woodland 400 kV underground cable (UGC)

In Step 2, the SAOI, shown as an orange oval in Figure 5.1, included three local authority areas: Kildare County Council and Meath County Council and South Dublin County Council. Within the SAOI were the three electrical substations which continue to be part of the project in Step 3: Dunstown Station in the townland of Dunstown, Co. Kildare, Maynooth Station in the townland of Taghadoe, Co. Kildare and Woodland Station in the townland of Woodland, Co. Meath. As the crow flies the distance between Dunstown and Woodland is approximately 36km. See Figure 5.1.

The existing substations and OHLs are in largely agricultural areas, settlements in the Step 2 SAOI included: Naas; Maynooth; Dunboyne; and smaller settlements such as Two Mile House, Carragh, Prosperous, Clane, Rathcoffey and Batterstown. There were also a large number of linear constraints within the SAOI, such as: road crossings, including motorways and national primary routes; railways; and rivers and canals.

In terms of landscape, the SAOI for Step 2 is described as being in lowland plains principally comprising fertile lands with relatively high levels of local population and intensive land management which includes several types of agriculture and equine facilities. The slope and topography of areas occur in a shallow / gradual transition; the area is generally characterised by flat terrain and low vegetation. Concentrations of tillage lands are described as being characterised by extensive views across large fields with low, maintained hedges. Other notable landscapes are identified, including river valleys, which are potentially vulnerable linear landscape features, as they are often highly distinctive in the context of the general landscape. Canal corridors are described as having generally open views to surrounding pasture and agricultural lands, with large sections of the canal banks blending into open pasturelands.

In consideration of a new OHL, the Step 2 SAOI was expanded for that option, to the western part of Kildare. A banana shape was used between Dunstown and Woodland stations, which avoided much of the existing 220kV

network. It took in the majority of west Co. Kildare. This area is largely characterised by peatland. Some of these boglands are used for recreation/education purposes such as the Bog of Allen Nature Centre in Lullymore operated by the Irish Peatland Conservation Council and Lullymore Heritage Park.

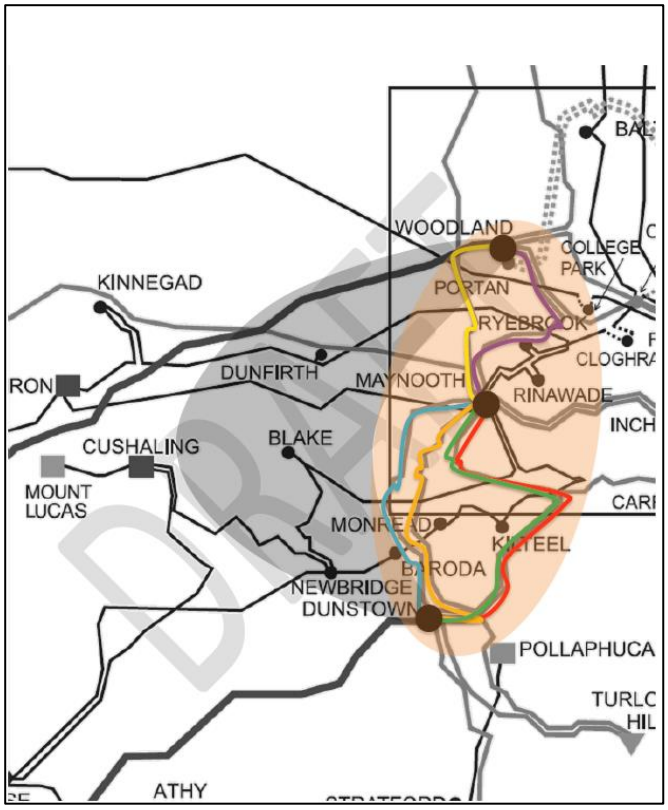


Figure 5.1 Step 2 SAOI

5.2 Revised Social Area of Influence: Step 3 SAOI

5.2.1 Overview

The SAOIs for each technological solution and the substations' proposals for Step 3 mirror the study areas identified in CP 966 Environmental Constraints report. The following overview of the revised SAOI takes the widest study area (Technologies 2 and 3) as its boundaries. To give an overview of the Step 3 SAOI, focus is on the region, settlements and major transport links within the project study area. More detailed baselines for each of the assessment topics are provided for each technological solution in Sections 6 to 9 of this report.

5.2.2 Region

The project study area lies within the Mid-East Region of Ireland and is within Counties Kildare and Meath. Project Ireland 2040 describes this region as having experienced high levels of population growth in recent decades, at more than twice the national growth rate. If the 2016 trend of internal migration outflows from Dublin to the other regions returns to 2006 levels, the Mid-East region is projected to show the highest percentage population increases by 2036, from 690,900 in 2016 to 965,300 by 2036.

There has been a rapid population growth in the rural areas with an increasing number of single rural dwellings, typically in linear form along road fronts. Consistent with Project Ireland 2040's National Strategic Outcome of 'Compact Growth', Meath and Kildare County Development Plans have policies which attempt to focus any

expansion of residential and commercial areas into the larger towns of the counties, however it is anticipated that there will be an increase in the number of linear settlements leading into and from both small and large towns.

5.2.3 Settlements

Settlement Hierarchy

A settlement hierarchy is set out to underpin decisions regarding the location and scale of new developments such as housing, employment creation and social and physical infrastructure provision. This is designed so that investment in infrastructure is focused on locations that are the most environmentally robust and provide the best economic return. This is consistent with the Compact Growth goal in Project Ireland 2040.

Table 5.2 and

Table 5.3 show the settlement hierarchies for Kildare and Meath, respectively, drawn from their County Development Plans (CDP). Development proposals are considered in a sequential manner with preference given to the top of the hierarchy and then within each designation, preference given to developments closet to the settlement core and with good public transport links. This is to prevent 'urban sprawl'.

Table 5.2 Kildare CDP Settlement Hierarchy

Designation	Settlement
Large Growth Town I	Naas
Large Growth Town II	Maynooth, Leixlip (including Collinstown), Newbridge
Moderate Sustainable Growth Towns	Metropolitan Area Celbridge, Kilcock Hinterland Area Athy, Kildare, Monasterevin, Kilcullen
Small Towns	Clane, Sallins, Kill, Prosperous, Rathangan, Athgarvan, Derrinturn, Castledermot
Villages	Johnstown, Straffan, Ballymore-Eustace, Allenwood, Johnstownbridge, Coill Dubh / Coolearagh, Kilmeague, Caragh, Kildangan, Suncroft, Robertstown & Ballitore/Timolin/Moone/Crookstown
Rural Settlements	Broadford, Milltown, Kilteel, Staplestown, Ardclough, Allen, Brannockstown, Twomilehouse, Brownstown, Cutbush, Maddenstown, Nurney, Calverstown, Rathcoffey, Narraghmore, Maganey/ Levitstown, Kilmead, Kilberry
Rural Nodes	Clogherinka, Cadamstown, Kilshanchoe, Newtown, Tirmoghan, Carbury, Timahoe, Lackagh /Mountrice, Ballyshannon, Ballyroe, Kilkea, Ellistown Moyvalley, Rathmore

Table 5.3 Meath Settlement Hierarchy

Designation	Settlement
Large Growth Town I	Navan, Drogheda Environs
Large Growth Town II	Dunboyne, Maynooth Environs
Moderate Sustainable Growth Towns	Ashbourne, Kells, Trim, Kilcock Environs, Dunshaughlin
Small Towns	Athboy, Bettystown/Laytown/Mornington East, Duleek, Enfield, Oldcastle, Ratoath, Stamullen
Villages	Ballivor, Carlanstown, Carnaross, Clonard, Clonee, Crossakiel, Donore, Drumconrath, Gibbstown, Gormonston, Julianstown, Kentstown, Kilbride, Kildalkey, Kilmainhamwood, Kilmessan, Longwood, Mornington/Donacarney, Moynalty, Nobber, Rathcairn, Rathmolyon, Slane, Summerhill

Settlements in the SAOI

There are major towns in the SAOI, including Newbridge, Naas, and Maynooth, all with populations of above 10,000. Newbridge is the largest of these with a population of 23,000 (2016). There are a number of other smaller towns with populations below 1,000. In addition to residential populations, these settlements host community facilities such as schools, churches, parks and recreational areas; employment areas; and retail areas.

Settlements in the project study areas are shown in Appendix A, Map 321084AE-MAP-011 and listed in Table 5.4 and Table 5.5 and categorised as small, medium or large based upon the population classifications set out by Central statistics Office (CSO) as follows:

- Small Towns: Less than or equal to 1,000 population;
- Medium Towns: 1,001 – 9,999 population; and
- Large Towns: 10,000 – 30,000 population.

Table 5.4 Settlements in SAOI Technology 1

Small Towns	Medium Towns	Large Towns
Carragh (965) Kilcloon (280) Ladytown (460) Rathcoffey (270)	Prosperous (2,400)	Maynooth (15,000)

Table 5.5 Settlements in SAOI Technology 2 and Technology 3

Small Towns	Medium Towns	Large Towns
Brownstown (885) Carragh (965) Coill Dubh (Blackwood) (750) Johnstownbridge (680) Kilcloon (280) Ladytown (460) Milltown (345) Rathcoffey (270) Robertstown (700) Straffan (855) Summerhill (880)	Athgarvan (1,200) Clane (7,300) Enfield (3,300) Johnstown (1,000) Kilcock (6,100) Kilcullen (3,700) Kill (3,400) Kilmeage (1,100) Prosperous (2,400) Sallins (5,900)	Maynooth (15,000) Newbridge (23,000) Naas (22,000)

Prime 2 spatial statistics relating to these settlements are provided in Appendix B and summarised within the updated social baseline for each SAOI. An overview of the key settlements within the SAOI is provided in this section.

Maynooth

Maynooth is a university town in north Kildare, 24km west of Dublin on the Dublin-Sligo railway line. It is served by the Commuter and InterCity train services and therefore is a key commuter town. Maynooth is located on the R148 road between Leixlip and Kilcock, with the M4 motorway bypassing the town. Other roads connect the town to Celbridge, Clane and Dunboyne. There is an approved application for 460 new homes to the north east of Maynooth.

During the academic year Maynooth doubles in size. There are two third-level educational institutions: St Patrick's College and Maynooth University, which share campus space and many facilities. There are two secondary schools, Maynooth Post Primary and Maynooth Community College, in addition to five primary schools.

The town contains a number of other amenities including a fire station, Garda station, health centre, public library and four churches.

There are number of sports clubs and amenities within Maynooth including Carton House Golf Club which is the headquarters of the Golfing Union of Ireland. Maynooth GAA, Maynooth Town FC and North Kildare RFC are located within the town centre. Moyglare Stud Farm and Le Chéile Athletic Club and two cycling clubs are also within the town boundaries.

Maynooth is on the Royal Canal which is navigable from central Dublin to this point and is now mostly used for leisure purposes.

Newbridge

Newbridge is the largest town in Kildare located on the banks of the River Liffey. The M7 motorway bypasses the town the south and forms the boundary of the town. The town is situated on the main Dublin-Cork railway line which connects the town to Dublin, Cork, Limerick, Galway, Waterford and Westport. A regular commuter train service operates between Newbridge and Dublin.

There is planning approval for a new regional distribution centre to the north east of the town on the Naas Road; two separate developments of 385 and 281 residential units respectively, to the north west of the town; 100 residential units to the immediate south west of the town; and 381 residential units to the east of the town.

There are a number of churches Newbridge serving several denominations. There are seven primary schools, eight secondary schools and Kildare VTOS education centre for mature students.

The county grounds for Kildare GAA are located in Newbridge, in addition to two local teams: Sarsfield and Moorefield. There are also two active soccer clubs, Newbridge Town FC and Newbridge Colts FC, and a rugby club, Newbridge RFC.

Other community amenities include Newbridge Library and arts centre, Liffey Linear Park, Newbridge sports centre, several golf courses, the Curragh Racecourse, a greyhound racing track and Gables Leisure Centre.

Naas

Naas is the second largest town in Kildare. The town is bypassed by the M7 Limerick to Dublin to its northern boundary. Naas and nearby Sallins share a railway station which is used for daily commuting to Dublin with average travel times around 30 minutes to Dublin City Centre. There are approved applications for 395 new homes and a new neighbourhood centre to the east of Naas and 284 homes to the south east of that development. There a further housing development with planning approval where existing residential units are demolished and

replaced with new homes. There is also approval for a solar PV energy development of 8 hectares and an application for up to 20 light industrial units; both of these to the north east of the town.

Public amenities include Naas General Hospital, Naas Racecourse, Mondello Park International Motor Racing Circuit, a library, the Moat Theatre, cinema, a number of local schools including five secondary schools, post office, tax office and driving test centre. There are also a number of sports clubs including Naas GAA, Naas AFC, four soccer clubs, a Rugby Club, Hockey Club, Cycling Club, Gymnastics Academy, Tennis Club, Athletics Club and a number of swimming pools and leisure centres. Naas Gold Club is actually located in Sallins. There a number of equestrian facilities in the area, and Naas Racecourse and Punchestown Racecourse.

Clane

Clane is Medium sized town in County Kildare located at the cross roads between the R403 and R407. There is an approved application for 366 new homes to the north of Clane.

There are a number of sports amenities in Clane including Clane Rugby Club, Clane GAA club, Clane United soccer club, Clane Tennis Club, Millicent Golf Club and a number of community centres. There are two churches in the town, three primary schools and two secondary schools.

Kilcock

Kilcock is a medium sized town, situated on the Royal Canal (River Rye) at the southernly extent of the Co. Meath border with Co. Kildare. There are four schools in the town, including a Gaelscoil and a secondary education facility. Kilcock's recreational amenities include a GAA and football club, two gyms and a golf club on the outskirts of the town. Residential dwellings within the town are largely within housing estates, the majority of permanent private households were built between 2001 – 2010. Growth in housing numbers has slowed considerably in the past decade, but an application has been approved for the construction of 450 new homes to the immediate east of the town, 120 homes to the north of the town in County Meath and a distributor road to connect the R158 to the R125. An area within the town centre, less than 1km^2, is designated as an Architectural Conservation Area by Kildare CC.

To the south of the town Courttown Demesne is allocated as an Integrated leisure zone; planning approval has been given for a hotel, holiday homes, golf course and a small business park.

Sallins

Sallins is a medium sized town less that 4km north of Naas. Sallins has been rapidly expanding due to its position on the Grand Canal which is popular for fishing and boating and the Dublin to Cork railway line making it a key commuter town. There is one primary education level school in the town, Sallins National School. Sallins GAA has its grounds in the centre of the town and the club facilities include a championship sized pitch, a club house and dressing rooms. Naas Golf Club is just to the west of the town. An area to the south of the railway through Sallins has planning approval for more than 100 residential units and includes for the demolition of approximately 90 existing houses; construction at the site is already underway.

The M7 from Limerick to Dublin bypasses Sallins to the south and separates the town from Naas.

Prosperous

Prosperous is a medium sized town in Kildare at the junction of the R403, which is the main road through the town, and R408. Prosperous is within 20km of both the M4 (to the north) and M7 (to the south) motorways. Prosperous Main Street runs perpendicular to the R403 and meets the R408 at a T-junction. Prosperous contains the following amenities; Tennis Courts, Caragh GAA, Little Oak Equestrian Centre, Prosperous United AFC, Pitch and Putt, a primary and post-primary school. There is existing planning approval for approximately 90 residential units across two sites to the west of the town.

Other smaller settlements

As detailed in Table 5.4 and Table 5.5 there are a number of other smaller towns and villages within the study area. Carragh and Straffan are reasonably typical examples of these within the SAOI.

Carragh

Carragh is a village in County Kildare, located on the R409 between the River Liffey and the Grand Canal, 6.1km north-west of Naas. Carragh is 3km north-west of the M7 (junction 10).

The main amenities in the village are Our Lady & St Joseph Church, one primary school, a community hall, a GAA Club, Caragh GAA (actually located in Prosperous), Caragh Celtic FC, Caragh Fishing Club and a motor racing circuit. The Dublin to Cork railway line runs through the village but there is no railway station.

Straffan

Straffan village is located on the banks of the River Liffey. They key amenity in the area is the K Club (Kildare County Club which has two championship golf courses which have hosted many international competitions including the European Open and the Ryder Cup.

Other social amenities in Straffan include 2 churches, one Roman Catholic, one Church of Ireland, a GAA club, soccer club, a primary school, and a Steam Museum.

Single Rural Dwellings

There are a number of linear settlements of ‘single rural dwellings’ in the SAOI; in these communities dwellings are typically constructed alongside regional or local roads. These settlements are not necessarily related to agriculture but more likely form as ‘spurs’ out from larger settlements. These settlements would typically be served by private water supplies and septic tanks; there are few services for these communities, and they are car dependent.

Stud Farms and Farmsteads

Stud farms and agricultural land and associated buildings are considered in the social impact assessment. Temporary disturbance or access disruptions to farming enterprises will be possible.

6. Technology 1: Up-voltage existing 220kV circuits to 400kV circuit

6.1 Overview of Technology 1

This technological solution consists of the 'Up-voltage' of some of the existing 220 kV circuits between existing Dunstown 400 kV station and Woodland 400 kV station.

6.1.1 Up-Voltage

It is anticipated that this can be done using a new technology which would enable the existing 220 kV towers to be modified and the 220 kV conductors replaced with 400 kV conductor to create a new Dunstown – Woodland 400 kV circuit. For the purpose of this assessment it has been assumed that all towers and foundations along the existing route will be replaced with the proposed tower type shown in Figure 6.1. However, it is unlikely that all of the towers and foundations would need to be replaced; further work on this following the options appraisal will determine the extent of the demolition and replacement required. As such, this assessment is based on a worst-case scenario.

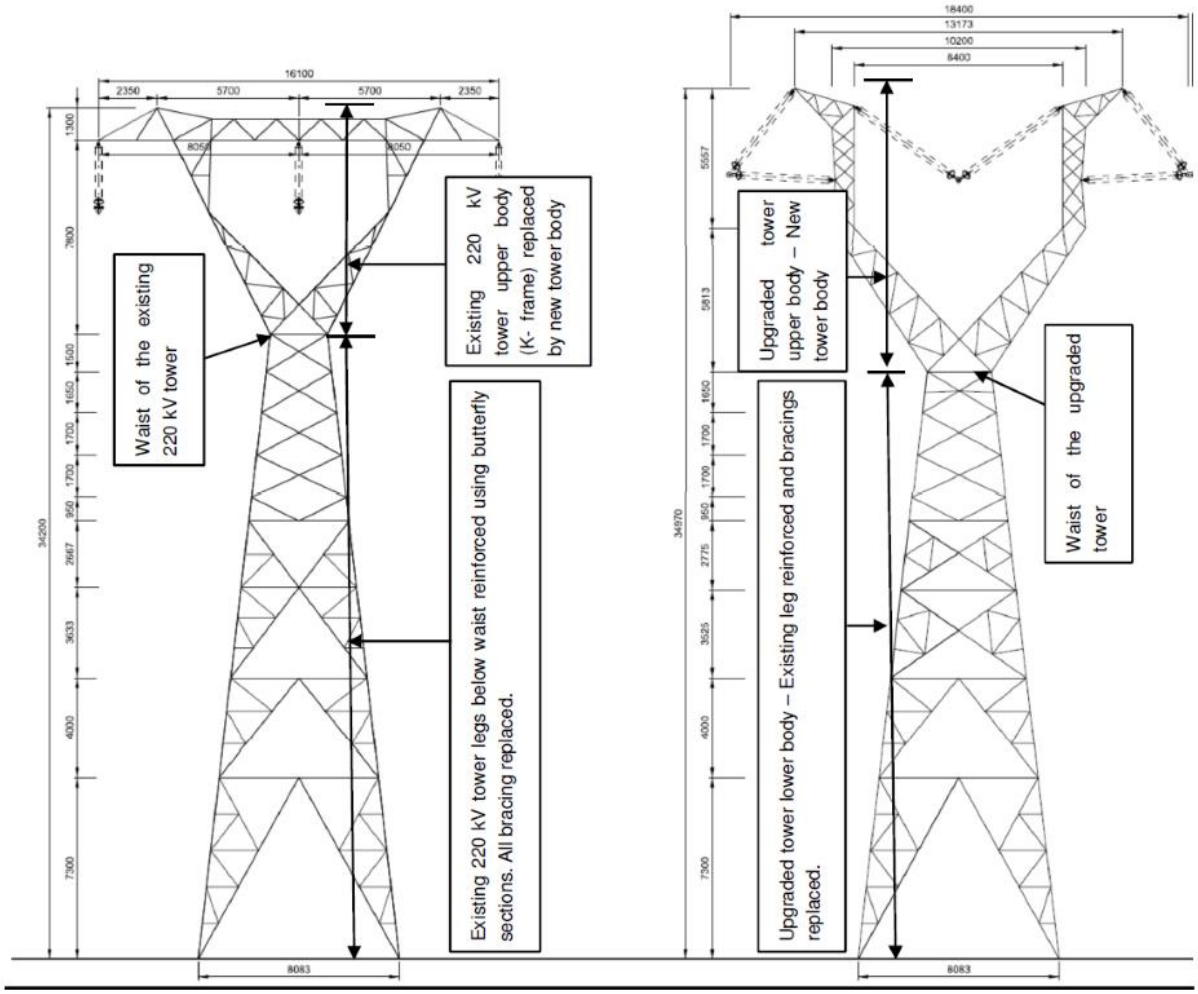


Figure 6.1 Existing and Potential new Tower Type for Technology 1.

The circuits selected to achieve this are Gorman – Maynooth 220 kV circuit and the Dunstown – Maynooth 220 kV circuit.

6.1.2 Woodland Turn-In

A number of additional elements are required to facilitate this solution, including a 'turn-in' to Woodland substation from the Gorman – Maynooth 220 kV circuit and station work at three existing stations: Woodland, Maynooth and Dunstown.

In order to use the existing Gorman – Maynooth 220 kV circuit to create the new 400 kV circuit, it will be 'broken into' somewhere in the northern part of the Technology 1 Study Area shown in Figure 5.5. At the 'break-in point' two new connections are proposed to connect to Woodland substation. One new 220 kV circuit and one new 400 kV circuit. The connection back to Woodland station can be achieved using either overhead line or underground cable. This will create two new circuits into Woodland station, namely a Gorman – Woodland 220 kV circuit and a Woodland-Maynooth 400 kV circuit.

Potential options for the 'turn-in' to Woodland Substation have been identified and investigated; the findings are presented in 32108AE-REP-009 CP966 Woodland 'Turn-In' Feasibility Report[xvii].

It should be noted that the various options for the turn-in at Woodland will not be a material consideration in the decision as to which technology (or technologies) is taken forward into Step 4.

The technology alternatives for this element, for both the 220kV 'turn in' to Woodland substation and the 400 kV new connection from Woodland substation, include:

- Option 1A: Single circuit OHL connections (two corridors);
- Option 1B: Single circuit UGC connections (two 12m cable swathes); and
- Option 1C: Double circuit OHL connections.

Option 1A

The objective of Option 1A is to provide two separate circuits from the existing 220kV OHL towards Woodland substation using new single circuit towers; one corridor for the 220kV OHL and one for the 400kV OHL. Alignments presented in Figure 6.2 are only an indication of the route principle. The connection could be made from various point along each alignment although this will affect the length of the new section.

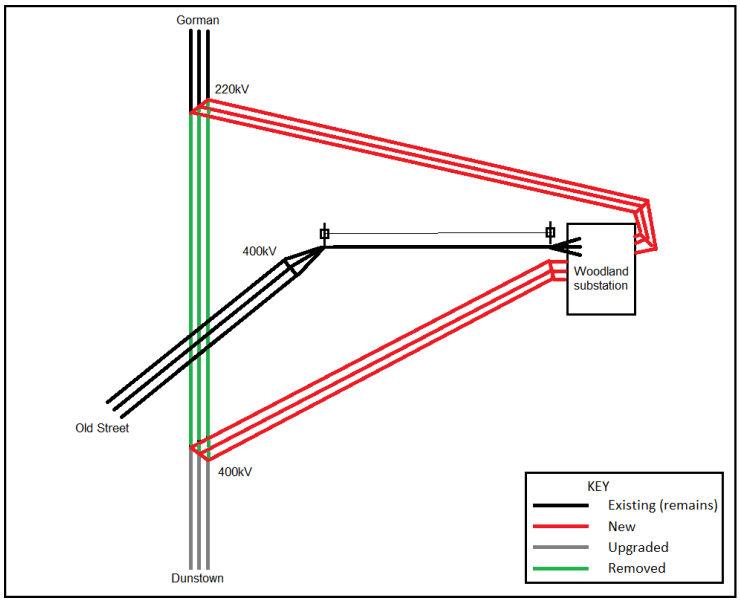


Figure 6.2 Option 1A

Option 1B

The objective of Option 1B is to provide two separate circuits from the existing 220kV OHL towards Woodland substation in a similar configuration to Option 1A but using UGCs. The interface between existing and new cable

being provided by cable sealing end compounds positioned adjacent to the existing OHL alignment. Alignments presented in Figure 6.3 are only an indication of the route principle. The connection could be made from various points along each alignment although this will affect the length of the new section. The cable route would be determined in accordance with the principles and details presented in the Cable Feasibility Report (321084AE-REP-001).

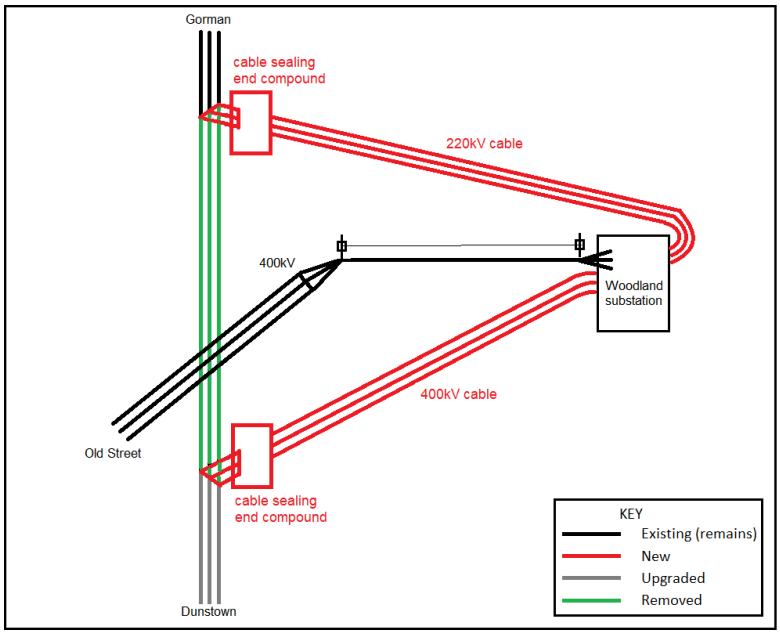
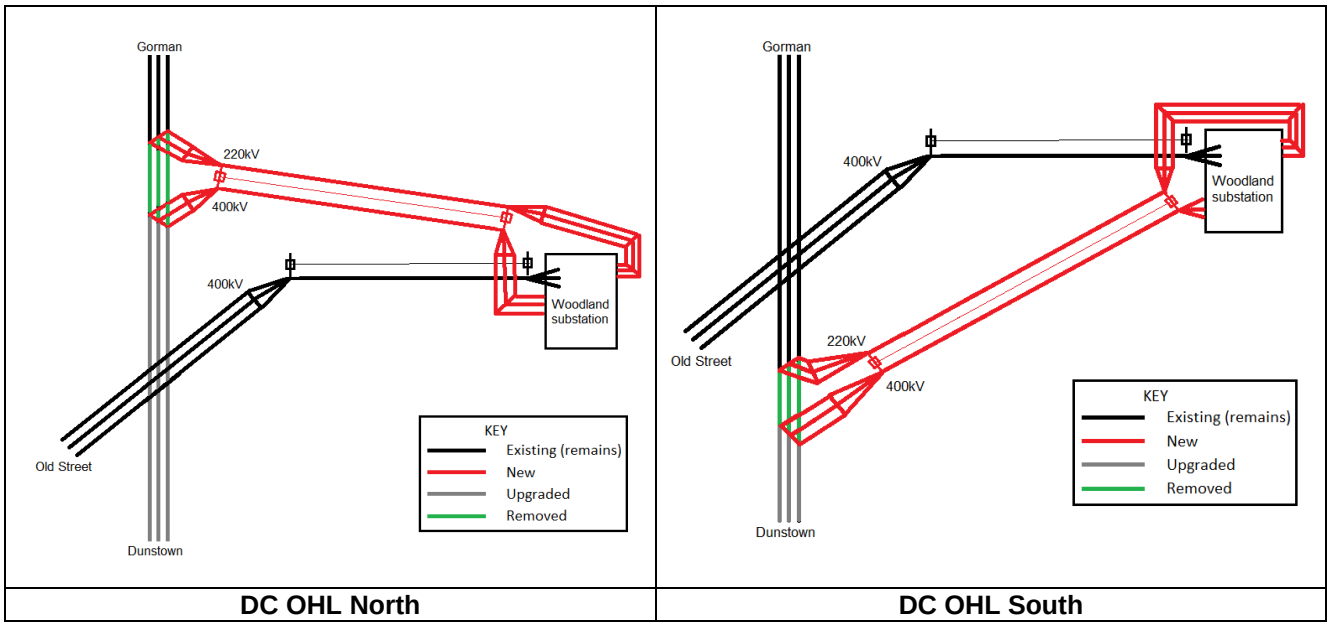


Figure 6.3 Option 1B

Option 1C

The objective of Option 1C is to achieve the required connection using one double circuit OHL between a new tower positioned on the line of, or adjacent to, the existing OHL alignment and Woodland substation, either north or south of the existing crossing point. This would carry both the 220kV OHL and the 400kV OHL. Alignments could be to the north or south of the existing crossing point as presented in Figure 6.4, which is only an indication of the route principle. The connection could be made from various points along each alignment although this will affect the lengths of new OHL and cable sections.



DC OHL North	DC OHL South

Figure 6.4 Option 1C

6.2 Technology 1 SAOI

The SAOI identified for Technology 1 is, for the most part, limited to the route corridor of the existing infrastructure. In accordance with the findings of EirGrid Study 10 relating to Landscape and Visual impacts[xviii], the SAOI for the existing 220 kV circuits extends to 1.6km either side of the 'centre line'. Beyond this distance, no significant visual impacts are likely to occur.

It is widened near Woodland substation to accommodate the 'turn-in' to the substation from the Gorman – Woodland 220 kV circuit. See Figure 6.5.

Notwithstanding this, some consideration outside of this extent has been necessary for some social impacts. For example, where local communities are currently in very close proximity to the 220kV circuit (less than 50m), consideration has been given to the possibility that a diversion to the existing corridor may prove necessary and additional constraints identified in those areas.

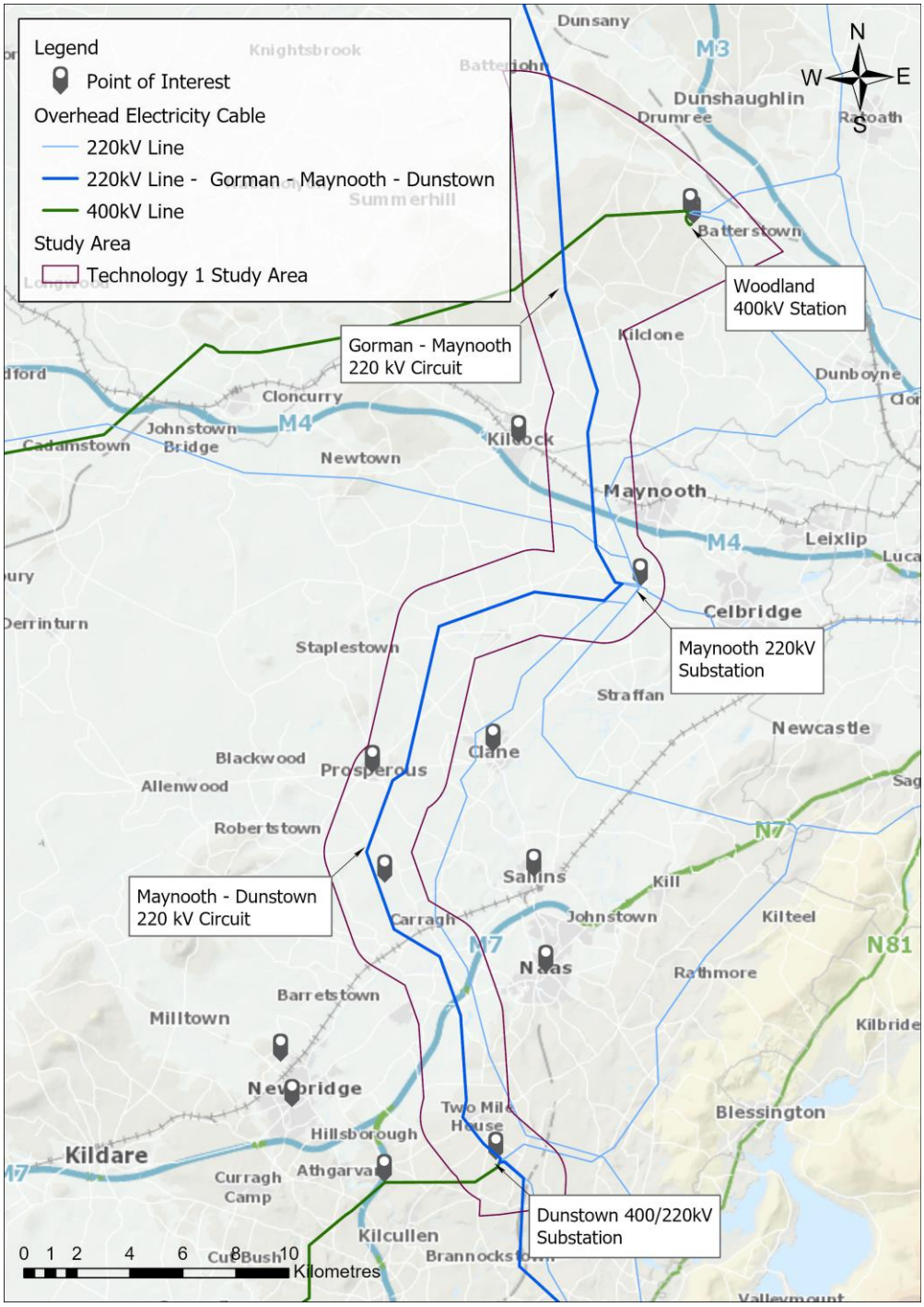


Figure 6.5 Technology 1 Study Area

6.3 Assumptions and Limitations

For this technology, the following assumptions have been made:

- The existing 220kV OHLs towers and foundations will be removed in their entirety and new towers installed on new foundations;
- It is assumed that the up-voltage will be on the same route as the existing OHL and not divert from it in any location;
- For the Woodland Turn-In, the OHL options would be constructed using access form local roads, no access track along the route corridor would be installed, and no bridges across waterbodies required; and
- For the Woodland Turn-in, the UGC option (Option 1B) will be installed across third party land as there is no capacity in the local road network to facilitate a road installation.

There are limitations to the assessment:

- For the up-voltage, it is not yet understood how the construction of this would be achieved; it could require temporary OHLs, or it may be achieved through the use of outages. As a result, this aspect has not been included in the assessment; and
- There may be a need to divert form the existing corridor of the OHL, as properties are in close proximity to the existing line. This has not been included in the assessment as it is not currently understood where, if anywhere, such diversions might occur.

6.4 Potential Social Impacts

The potential social impacts, organised under the various assessment topics, are described in terms of baseline and potential impacts on them from the proposed solution. Following this, each topic is considered in the context of risk and EirGrid's colour scheme used to illustrate the potential risk from each constraint for this solution. The assessment combines constraints during construction and operation, assuming construction constraints are temporary.

More significant/difficult/risk Less significant/difficult/risk

This risk scale is clarified by text, as follows:

- High: dark blue;
- Moderate-high: blue;
- Moderate: dark green;
- Low-moderate: green; and
- Low: cream.

6.4.1 Amenity and Health

Baseline

As the 220kV OHL travels south from Woodland to Maynooth substation, the population and number of properties increases; there are however only a limited number of settlements in close proximity to the existing corridor, with a number of properties in linear communities along regional roads which are crossed by the 220 kV OHL. For the most part, the existing 220 kV circuit is at a distance from residential properties; there are parts of the circuit which

are within 50m of residential properties, however. Examples include, west of Halverston cross roads which is to the north west of Naas; Connaught Bridge, between the M7 and the Grand Canal; and Stephenstown South at Two Mile House.

Most of the properties in the SAOI are houses or bungalows, with apartments mainly close to larger settlements such as Kilcock or Maynooth, although even in Maynooth, apartments represent just 10% of the housing supply. Settlements in the SAOI are: Maynooth (the western edge of it); Rathcoffey; Prosperous; Carragh and Ladytown (Two Mile House).

The existing 220kV line goes through the settlements of Carragh, Prosperous and the outskirts of Maynooth.

General health in those areas is described by the population as being mostly of Fair to Very Good as illustrated in Table 6.1.

Table 6. 1 Technology 1: General Health in key settlement areas (no. people)

General Health	Carragh	Prosperous	Maynooth
Very good	768	1468	9611
Good	167	605	3775
Fair	22	161	813
Bad	0	30	100
Very bad	0	3	17
Not stated	9	66	269
Total	966	2333	14585

Source: CSO

For the Woodland Turn-In, there are a number of residential properties in the Study Area between the existing 220 kV Gorman-Maynooth circuit and Woodland substation (see Figure 6.6). The properties are quite dispersed but in places cluster to form small linear communities alongside local roads. Small Area statistics for this area show that all households are in houses or bungalows, none in apartments or mobile homes; this is typical of low-density populations.

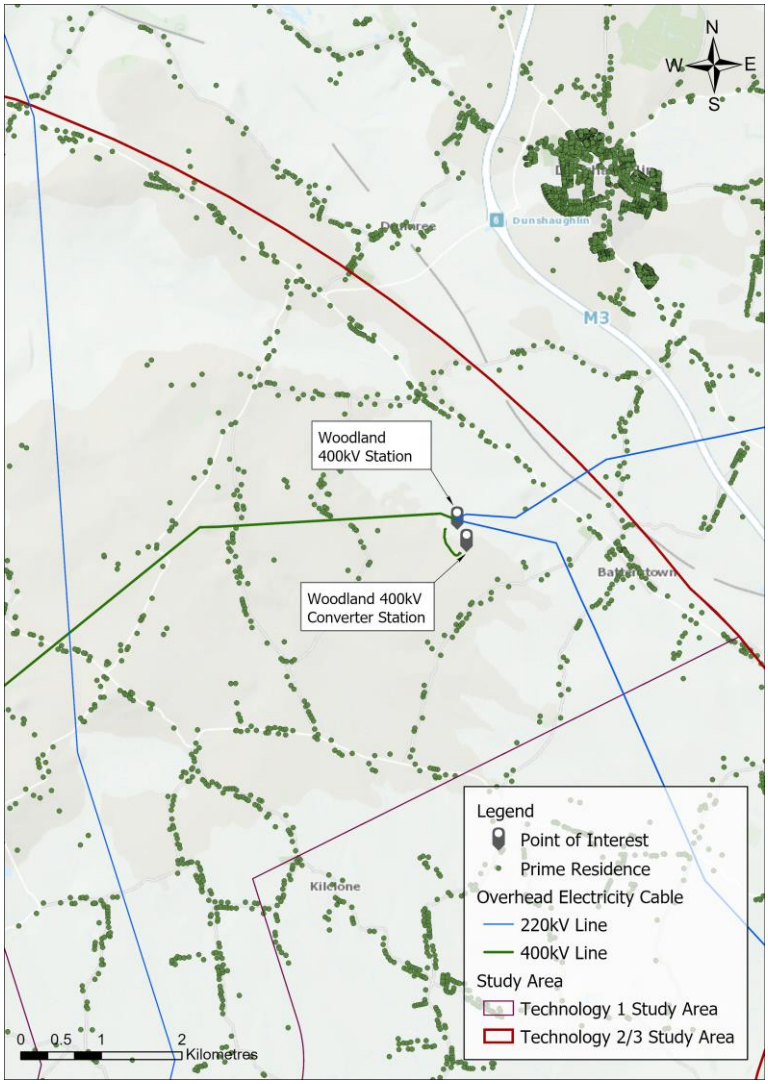


Figure 6.6 Residential Properties in vicinity of Woodland 400kV Substation

The land surrounding the properties is agricultural, arable. Given its rural nature, background noise levels in the Technology 1 Study Area would be expected to be low; air quality would be good, and traffic would be at a low level: the local roads are narrow and largely serving the local community only.

In addition to these proposed developments, there are additional transmission network projects in the planning and development stage for connection into Woodland substation:

- CP 1021: Woodland-North Dublin Reinforcement;
- CP 0466: North-South Interconnector; and
- CP 0869: Maynooth - Woodland 220kV Line Refurbishment

Potential Impacts

The construction of this technological solution may, in the worst case, present amenity effects for local communities; in the worst case, the existing 220 kV line would be dismantled and removed including tower foundations; this could create noise and dust impacts and a number of different impacts associated with construction traffic. In addition, to maintain supply during the up-voltage, it is likely that a temporary OHL would be constructed, in rolling sections along the route, to minimise the outages required for the up-voltage works. This

would present additional visual impacts during the construction phase and disruption during the installation and dismantling of the temporary line.

There are no significant tourism sites within the Study Area; community facilities and commercial sites are already impacted upon by the existing 220 kV OHL and are not likely to be affected by significant additional impacts.

There may be concerns from local communities about the increased voltage of the OHL from 220kV to 400kV with respect to EMF and health effects. In addition, the new towers will be 770mm taller than the existing ones and represent a slightly greater visual impact. There could also be increased noise emissions during operation; those living within 200m of the 220kV line may already be subject to noise impacts at certain times, such as in wet weather and these may be greater with a 400kV OHL.

For the Woodland Turn-in Options, in addition to similar effects as those described for the Up-voltage works, specific effects could include:

- Option 1A: single OHL circuits, two corridors:
  - During construction: the likely use of local roads for access for construction vehicles and the requirement for piling for new foundations for the new OHLs, could create dust, noise and traffic impacts. In addition to this, temporary additional visual effects as a result of the construction works mean that there is potential for significant amenity effects.
  - During operation: whilst EirGrid aims, as far as is practical, to avoid residential properties, however the scattered nature of properties here means that it may prove difficult to identify a route for two OHL corridors, with the area to the south of the existing 400kV OHL being particularly constrained.
- Option 1B: single UGC circuits, two corridors, it is assumed the cables cannot be installed in the local road network as the local roads are not wide enough to accommodate a 12m swathe:
  - During construction: two 12m swathes across grassland would be required; there is potential for amenity effects from dust, noise and traffic impacts during construction and as a result of stripped soil. There would be few visual impacts from this option.
  - During operation: there would be no amenity or health effects.
- Option 1C: double circuit OHL, one corridor:
  - During construction, there would be similar impacts as for Option 1A, however with only one corridor they would be lower in magnitude.
  - During operation: if the new OHL were constructed to the south of the existing 400kV line it would be further away from sensitive landscapes but closer to a greater number of residential properties. From an amenity perspective a route to the south would be of greater significance than a route to the north.

There is potential for cumulative effects on the amenity of the area in close proximity to Woodland Substation, as a result of the other proposed electricity transmission projects. It is difficult to determine the extent of this at this stage. There are no timeframes for the construction of these projects, indeed some are still within the pre-planning phase. Two of the three projects are reinforcement or refurbishment; the North south interconnector is proposed to use the spare suspension arm of the double circuit towers of the existing 400kV OHL for its conductors. Notwithstanding this, if all projects were constructed at the same time the magnitude on the amenity of the local community would be high as a result of large amounts of construction traffic throughout all areas and potential noise at once. Furthermore, if the projects were constructed sequentially the magnitude on the amenity of the local community would still be considered as high due to construction traffic and also potential noise over a sequenced long period of time.

Colour Coding for MCA

For the up-voltage of the 220kV, effects on amenity and health are considered to have moderate risk.

Amenity and Health

The greatest potential impact is during construction as once installed, the new OHL would look very similar in size and form to the existing OHL; there could be increased anxiety regarding the OHL in operation as a result of the increased voltage and EMF, potentially leading some stress related health effects, although these would not likely be greater than moderate risk. The risk during construction is based on the worst-case scenario of the existing OHL having to be fully dismantled and all foundations removed.

For the Woodland Turn-in, there were three options to consider. The colour code for each is shown below:

OPTION 1A - Single circuit OHL connections (two corridors)	**OPTION 1B - Single circuit UGC connections (two 12m cable swathes)**	**OPTION 1C - Double circuit OHL connections**

The amenity effects during construction for Option 1A are likely to be similar in nature as those for the Up-voltage, although over a much shorter route and as a result a lower level of magnitude.; In operation, Option 1A proposes two new OHLs in the landscape and so is considered a moderate risk. Option 1B would have the most significant effects of all of the options on amenity during construction, and so is considered a moderate risk, although it would have very little effects on amenity during operation. Option 1C has a lower impact for construction and operation compared to Option A as it requires only one corridor and is a low to moderate risk.

6.4.2 Economy

Baseline

The land use within the SAOI is largely agricultural, except for a small number of settlements; there is one area of commercial peat extraction to the north of Prosperous. The two substations, Dunstown and Woodland, are in relatively remote areas around Two-Mile House in the south and Batterstown in the north. The existing 220kV line goes through the settlements of Carragh, Prosperous and the outskirts of Maynooth and Kilcock.

The percentage of the population who are unemployed or looking for their first job in the major settlements is as follows:

- Maynooth - 4.9%;
- Rathcoffey – 14%;
- Prosperous – 9%;
- Carragh – 6%; and
- Ladytown (Two Mile House) – 3%.

This compares to a national average of 7%; Kildare 7%; and Meath is also 7%.

To the north of the study area, near Woodland Substation, there is a very low level of unemployment, with numbers ranging from 2 to 4%. Most of the working population in this area are in skilled or professional jobs, with a significant minority in the farming industry.

There is a broad mix of industries within the SAOI, however, as defined by the CSO.ie Small Area Statistics, Commerce and Professional Services are the most common. There are a small number of commercial sites; with 44 properties being identified on OSI as being Commercial premises; including a business park off the M7 west of Naas, Blackberry Stables west of Maynooth and an equestrian centre north of Kilclone. Corduff Stud is within the study area, to the south west of Prosperous, however the existing OHL does not cross the lands associated with the stud.

Potential Impacts

The most significant economic beneficial impact from the Up-voltage is the same as for the other technologies, the reinforcement of the network. As this is the same for all technologies and not a differentiator or a constraint it is not discussed further here.

Potential impacts on land use are specifically addressed in the Environmental Constraints report; however, the economic impacts of impacts on land use are discussed here. No significant adverse impact on land use as a result of the up-voltage is considered likely; there would be some temporary land take during construction, however the existing OHL already has a permanent wayleave to it for operational and maintenance reasons and the additional land requirement is not considered to be significant, especially as construction access will be from local roads and using existing field accesses.

Commercial sites within the study area already work within the constraints imposed by it; it is unlikely there would be additional impacts as a result of the up-voltage, except possibly during construction, during which there may be temporary disruption to traffic and access, impacting commuters and distribution networks,

Construction of the Up-voltage technology could potentially provide labouring and other unskilled jobs locally, however there are low levels of unskilled workers in the SAOI and any skilled workers required for the construction work would most likely have skills specific to the installation of an OHL and be brought into the region from elsewhere. It is not likely that this would be a significant beneficial effect in the SAOI.

There is potential for benefits as a result of an influx of construction workers, however this would be a relatively minor effects; in addition, there could be benefits from the need for accommodation locally and spending by the workers, however it is likely that this would also be relatively minor.

For the Woodland Turn-in Options, in addition to similar effects as those described for the Up-voltage works, specific effects could include:

- Option 1A: single OHL circuits, two corridors:
  - During construction: the likely use of local roads for access for construction vehicles could result in disruption to traffic and access.
  - During operation: there would be no significant effects on land use or existing commercial premises; no significant effects on the economy are expected.
- Option 1B: single UGC circuits, two corridors, it is assumed the cables cannot be installed in the local road network as the local roads are not wide enough to accommodate a 12m swathe:
  - During construction: as for Option 1A, the likely use of local roads for access for construction vehicles could result in disruption to traffic and access.
  - During operation: there may be an impact as a result of the restrictions placed on agricultural practice as a result of the cables crossing third party land.
- Option 1C: double circuit OHL, one corridor:
  - During construction, there would be similar impacts as for Option 1A, however with only one corridor they would be lower in magnitude.
  - During operation: as with Option 1A, there would be no significant effects on land use or existing commercial premises; no significant effects on the economy are expected.

Colour Coding for MCA

For the up-voltage of the 220kV, effects on the local economy are considered to be a low effect.

Economy

There is some potential for adverse and beneficial effects during construction as result of possible traffic and access disruption but also an influx of workers.

For the Woodland Turn-in, there were three options to consider. The colour code for each is shown below:

OPTION 1A - Single circuit OHL connections (two corridors)	OPTION 1B- Single circuit UGC connections (two 12m cable swathes)	OPTION 1C - Double circuit OHL connections

The economic effects during construction for Options A and B are likely to be similar as those for the Up-voltage, although over a much shorter route; both would require two new corridors and be constructed across third party lands. However, during operation, Option B may have a slightly higher impact as a result of restrictions on agricultural practices which will result in this option having a moderate risk impact. Option C has a lower impact as it requires only one corridor. No options are considered to have a high-risk impact on the economy during construction.

6.4.3 Traffic & Transport

Baseline

There a number of road crossings including two motorway crossings of the M4 and the M7; there are two railway crossings, the Dublin to Mullingar line and the Dublin to Kildare line; one crossing of the Grand Canal; and a number of river crossings, including the Liffey and several of its tributaries.

Local roads in the area are narrow, sometimes only 4m wide, especially in close proximity to Woodland substation, see Figure 6.7.

Figure 6.7 Local Roads in the SAOI

For the most part, major traffic and transport routes are within Kildare county; northern parts of Maynooth and Kilcock are within Meath.

Kildare's CDP reports that many residents of the county commute for employment, either within the county (60%) or, if outside, largely to the Dublin area. Within the county, there is a significant level of commuting into the north-eastern part where there is a concentration of major employers.

Congestion is anecdotally reported across Kildare and in particular in relation to Maynooth, Naas and Newbridge, the largest settlements.

Potential Impacts

For the most part the existing OHL crosses local roads, not regional roads and so access to it during construction could be challenging for the construction vehicles. The narrow local roads (see Figure 6.7) pose a significant constraint to the use of the public highway to deliver construction materials.

In attempting to use these roads, potential impacts include: driver and pedestrian delay; increased fear of accidents; and severance effects for local communities and businesses.

In addition, whilst there are permanent wayleaves already in place to the existing towers and conductors, these are likely to be designed with small vehicles such as jeeps in mind, not the size of vehicle that may be required to deliver sections of towers, drums for conductors and equipment required for the excavation and construction of new foundations. As a result, accesses may need to be widened and potentially some street furniture removed to allow access.

Traffic impacts may be minimised if it is possible to time works and deliveries to begin before or after travel to work or school times, e.g. before 7 or after 930am.

There are two motorways and two major rail lines crossing the SAOI; these would be crossed using scaffolding in accordance with existing operational and maintenance standards and it is not expected that these would be affected by the works.

For the Woodland Turn-in Options, in addition to similar effects as those described for the Up-voltage works, specific effects could include:

- Option 1A: single OHL circuits, two corridors:
  - During construction: the likely use of local roads for access for construction vehicles could result in disruption to traffic and access.
  - During operation: there would be no significant effects on traffic and transport.
- Option 1B: single UGC circuits, two corridors, it is assumed the cables cannot be installed in the local road network as the local roads are not wide enough to accommodate a 12m swathe:
  - During construction: as for Option 1A, the likely use of local roads for access for construction vehicles could result in disruption to traffic and access.
  - During operation: there would be no significant effects on traffic and transport.
- Option 1C: double circuit OHL, one corridor:
  - During construction, there would be similar impacts as for Option 1A, however with only one corridor they would be lower in magnitude.
  - During operation: as with Option 1A, there would be no significant effects on traffic and transport.

Colour Coding for MCA

For the up-voltage of the 220kV, effects on Traffic and Transport are considered to be moderate-high risk.

Traffic and Transport

There is some potential for adverse effects during construction as result of possible traffic and access disruption.

For the Woodland Turn-in, there were three options to consider. The colour code for each is shown below:

OPTION 1A - Single circuit OHL connections (two corridors)	OPTION 1B- Single circuit UGC connections (two 12m cable swathes)	OPTION 1C- Double circuit OHL connections

The Traffic and Transport effects during construction for Options 1A and 1B are likely to be similar as those for the Up-voltage, although over a much shorter route; both would require two new corridors and be constructed across third party lands but with access from local roads and therefore have a moderate risk impact on traffic and transport. Option 1C has a lower impact as it requires only one corridor.

6.4.4 Utilities

Baseline

It is unlikely that there would be additional third-party utilities to consider for the Up-voltaging works as it will utilise the existing locations of towers and foundations.

For the woodland Turn-in and new OHL foundations and cables, a utilities survey would need to be undertaken to determine what is present underground and any potential impact. For the most part utilities such as underground electricity cables, telephone networks, sewers and water supply pipes are located within the road network.

Above ground utilities in the area include telephone network cables and OHLs. Near to woodland, there is the existing Moneypoint to Woodland 400kV OHL travelling east to west; the Woodland to Maynooth 220kV OHL travelling north to south; and a 100kV OHL crossing to the south of Woodland substation in a north west to south east direction. There are a number of 220kV OHLs connecting into Maynooth substation in addition to the Gorman -Maynooth and Woodland-Maynooth OHLs; and three further110kV OHLs cross under the 220kV OHL within the SAOI travelling into the greater Dublin area. At Dunstown substation, there is the existing Moneypoint to Dunstown 400kV OHL, two additional 220kV OHLs, which leave Dunstown and travel south and a third travels east.

Potential Impacts

The likelihood of third-party utilities being an issue for the up-voltaging is low as it would be utilising existing locations which would already have been assessed for utilities.

For the Woodland Turn-in Options, there would be potentially new effects and specific effects could include:

- Option 1A: single OHL circuits, two corridors:
  - During construction: some potential for underground utilities at foundation sites which would need to be assessed and managed prior to construction commencing.
  - During operation: there would be no significant effects on utilities during operation of the OHL.
- Option 1B: single UGC circuits, two corridors, it is assumed the cables cannot be installed in the local road network as the local roads are not wide enough to accommodate a 12m swathe:
  - During construction: there is potential for impacts on underground utilities, in particular when local roads are crossed or it is in close proximity to homes which may have private water supplies and septic tanks. These effects would be addressed prior to construction.
  - During operation: there may be a minor impact as a result of restrictions being placed on the nature of utilities that can be close to UGC in local roads where these are crossed.
- Option 1C: double circuit OHL, one corridor:
  - During construction, there would be similar impacts as for Option 1A, however with only one corridor they would be lower in magnitude.
  - During operation: as with Option 1A, there would be no significant effects on utilities.

Colour Coding for MCA

For the up-voltage of the 220kV, effects on utilities is considered to be low.

Utilities

There is low potential for adverse effects during construction or operation.

For the Woodland Turn-in, there were three options to consider. The colour code for each is shown below:

OPTION 1A- Single circuit OHL connections (two corridors)	OPTION 1B - Single circuit UGC connections (two 12m cable swathes)	OPTION 1C - Double circuit OHL connections

The effects on utilities during construction for Options 1A and 1C are likely to be similar and whilst slightly more than for the Up-voltage, still low risk. There is a low to moderate risk from the construction and operation of the UGC option (Option 1B).

6.5 Key Social Issues and Evaluation of Technology 1

6.5.1 Amenity and Health

Up-voltage

For the up-voltage of the 220kV, effects on amenity and health are considered to be moderate risk. The greatest potential impact is during construction as once installed, the new OHL would look very similar in size and form to the existing OHL; there could be increased anxiety regarding the OHL in operation as a result of the increased voltage and EMF, potentially leading some stress related health effects, although these would not likely be greater than low to moderate risk. The risk during construction is based on the worst-case scenario of the existing OHL having to be fully dismantled and all foundations removed.

Turn-In

The amenity effects during construction for Option 1A are likely to be similar in nature as those for the Up-voltage, although over a much shorter route and as a result a lower level of magnitude.; In operation, Option 1A proposes two new OHLs in the landscape and so is considered a moderate risk. Option 1B would have the most significant effects of all of the options on amenity during construction, and so is considered a moderate risk, although it would have very little effects on amenity during operation. Option 1C has a lower impact for construction and operation compared to Option A as it requires only one corridor and is a low to moderate risk. Economy

6.5.2 Economy

Up-Voltage

For the up-voltage of the 220kV, effects on the local economy are considered to be a low effect. There is some potential for adverse and beneficial effects during construction as result of possible traffic and access disruption but also an influx of workers.

Turn-In

The economic effects during construction for Options 1A and 1B are likely to be similar as those for the Up-voltage, although over a much shorter route; both would require two new corridors and be constructed across

third party lands. However, during operation, Option 1B may have a slightly higher impact as a result of restrictions on agricultural practices which will result in this option having a low-moderate risk impact. Option 1C has a lower impact than 1B as it requires only one corridor. No options are considered to have a high-risk impact on the economy during construction.

6.5.3 Traffic & Transport

Up-Voltage

For the up-voltage of the 220kV, effects on Traffic and Transport are considered to be moderate-high risk. There is some potential for adverse effects during construction as result of possible traffic and access disruption.

Turn-In

The Traffic and Transport effects during construction for Options 1A and 1B are likely to be similar as those for the Up-voltage, although over a much shorter route; both would require two new corridors and be constructed across third party lands but with access from local roads and therefore have a moderate risk impact on traffic and transport. Option 1C has a lower impact as it requires only one corridor.

6.5.4 Utilities

Up-Voltage

For the up-voltage of the 220kV, effects on utilities is considered to be low. There is low potential for adverse effects during construction or operation.

Turn-In

The effects on utilities during construction for Options 1A and 1C are likely to be similar and whilst slightly more than for the Up-voltage, still low risk. There is a low to moderate risk from the construction and operation of the UGC option (Option 1B).

6.6 Summary Social Multi-Criteria Assessment for Technology 1

More significant/difficult/risk Less significant/difficult/risk

Table 6.1 Risk Assessment for the Up-Voltage for Technology 1

Topic	Technology 1
	Up-voltage
Amenity & Health	
Economy	
Traffic & Transport	
Utilities	
Summary	

Table 6.2 Risk Assessment for the Turn-In Option for Technology 1

Topic	Technology 1		
	Turn-In Option 1A	Turn-In Option 1B	Turn-In Option 1C
Amenity & Health			
Economy			
Traffic & Transport			
Utilities			
Summary			

7. Technology 2: New 400kV OHL

7.1 Overview of Technology 2

This technological solution consists of the construction of a new 400 kV overhead line (OHL) linking Woodland 400 kV station to Dunstown 400 kV station. No routes are proposed at this stage; however, it is anticipated that the new circuit would not be more than 50km in length.

Figure 7.1 illustrates a potential tower type for use in this solution. At 35m in height and 18.4m in width (conductor to conductor), it is smaller and more compact than the existing 400kV circuits.

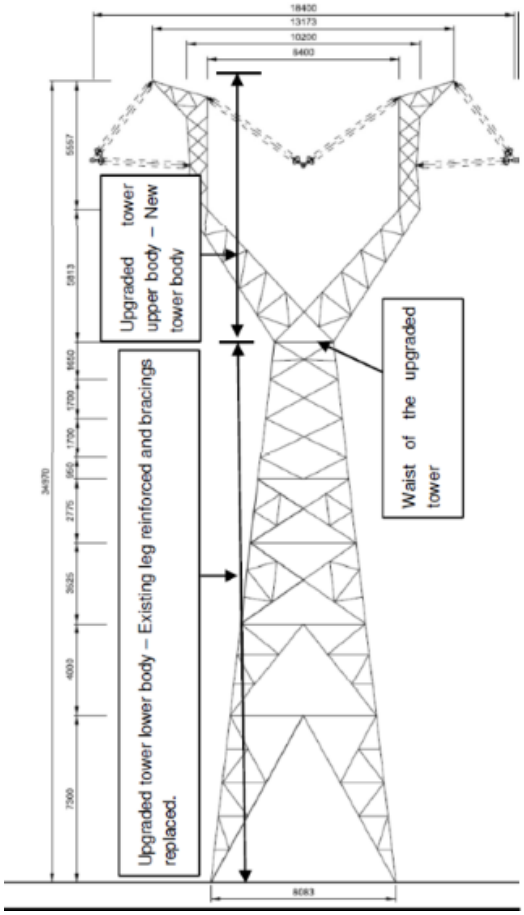


Figure 7.1 Potential Tower Type

7.2 Technology 2 SAOI

The Technology 2 SAOI has been influenced by EirGrid's policies and guidance on routing and infrastructure. Whilst an ideal 'straight line' study area between Woodland and Dunstown would present the shortest route with the fewest turns and need for larger tension (angle) towers at the line deviation points, this would encounter a significant number of constraints, including settlements, designated sites and important tourist amenities.

The SAOI has therefore been set wide enough to allow for the avoidance of environmental and social constraints. See Figure 7.2. In addition, some consideration outside of this extent has been necessary for some social impacts, for example to take account of commuting, tourism hotspots and potential distribution networks.

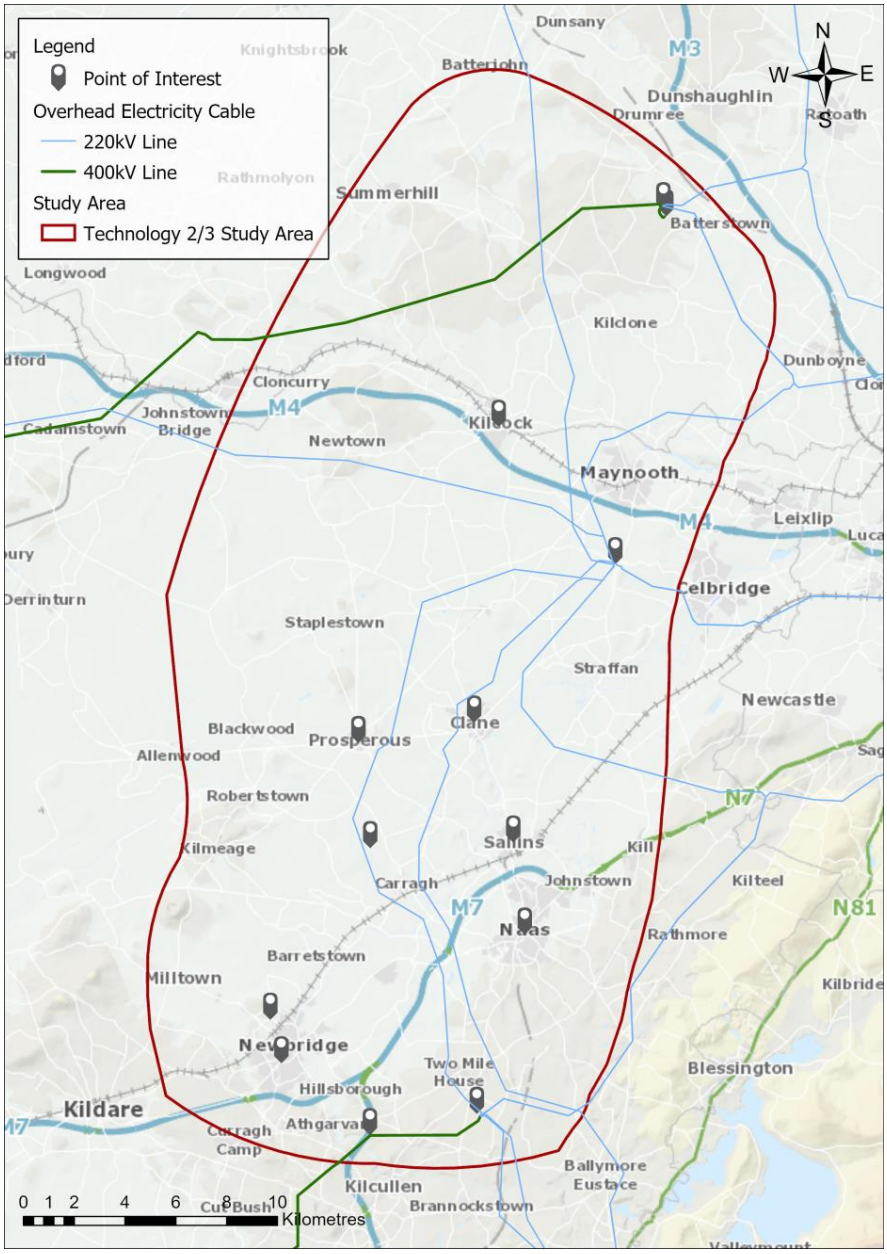


Figure 7.2 Technology 2 Study Area

7.3 Assumptions and Limitations

For this technology, the following assumptions have been made:

- The OHL options would be constructed using access from local roads, no access track along the route corridor would be installed, and no bridges across waterbodies required; and
- This assumption may not prevail for larger waterbodies such as the Liffey, where a temporary bridge or other means may be used to over sail it.

There are limitations to the assessment:

- There are currently no defined routes for the OHL; as such this assessment considers a reasonable worst-case scenario whereby settlements and protected sites are generally avoided but thereafter the greatest potential impacts on environmental constraints are identified.

7.4 Potential Social Impacts

The constraints, organised under the various topics, are described in terms of baseline and potential impacts on them from the proposed solution. Following this, each topic is considered in the context of risk and EirGrid's colour scheme used to illustrate the potential risk from each constraint for this solution. The assessment combines constraints during construction and operation, assuming construction constraints are temporary.

More significant/difficult/risk Less significant/difficult/risk

This risk scale is clarified by text, as follows:

- High: dark blue;
- Moderate-high: blue;
- Moderate: dark green;
- Low-moderate: green; and
- Low: cream.

7.4.1 Amenity and Health

Baseline

Population

The SAOI is a densely populated area immediately west of Dublin; with a number of towns, as set out in Section 5 of this report. These include the large towns of Newbridge, Naas, and Maynooth – all with populations of above 10,000. Newbridge is the largest of these with a population of 23,000 (2016). Outside of the settlements, much of the population lives in linear communities alongside regional and local roads. In addition to residential populations, these settlements host community facilities such as schools, churches, parks and recreational areas; employment areas; and retail areas. All settlements within the SAOI are listed in Section 5.2.2, categorised as large, medium or small towns and illustrated on map 32108AE-MAP-008.

Figure 7.3 presents the residential properties within the SAOI; the busy nature of the figure indicates the significance of this constraint and the already large population, which is predicted to rise.

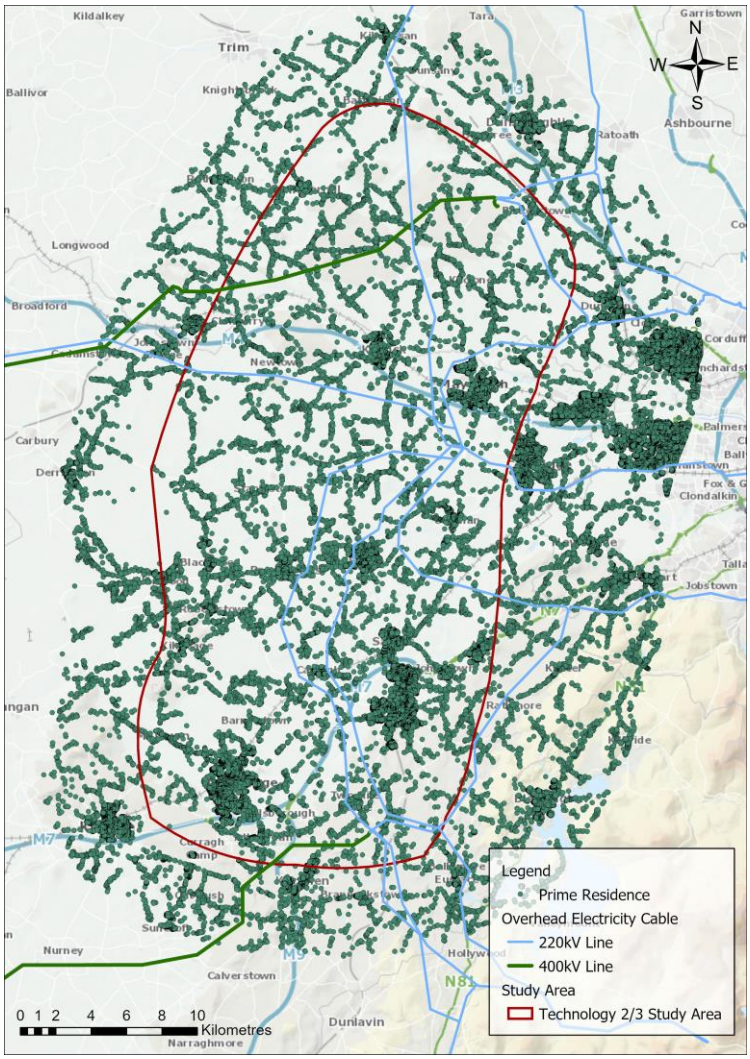


Figure 7.3 Residential Properties in the Technology 2 SAOI

The SAOI does not precisely align with administrative boundaries within the census data; as a proxy for this, statistics for the whole counties of Meath and Kildare have been used to give an indication of the region's performance in key indicators.

Meath

The population of Kildare has increased from 162,831 in 2006 to in 184,135 in 2011 and 195,000 in 2016, representing a growth of 13% to 2011 and 20% to 2016. Over a 25-year period (1991-2016), Kildare experienced an 81.5% increase in its population.

Despite the increase in population in Meath, the number of houeholds in Meath grew only modestly from 62,201 2011 to 64,294 in 2016; a 3% increase, with a very slight increase in the number of persons per household, from 2.96 to 3.

Kildare

The population of Kildare has increased from 186,335 in 2006 to 210,312 in 2011 and 222,500 in 2016, representing a growth of 13% to 2011 and 19% to 2016. Over a 25-year period (1991-2016), Kildare experienced an 81.5% increase in its population.

The most recent increase in population can be explained by high levels of natural increase (birth rate) and a strong performance in net migration. Growth in population has occurred within and around the central towns of Naas, Newbridge, Kildare, Clane and Kilcullen, resulting in a dense pattern of growth along the M7 and M9

motorways. Significant pockets of population growth have also occurred in the north of the county. Populations more than doubled in the rural hinterlands of urban centres like Athy, Naas, Newbridge, Clane and Kilcock and the village of Caragh. The most populated areas in Kildare are within and close to the main urban settlements of Newbridge, Naas, Celbridge, Leixlip, Maynooth and Athy.

The number of houeholds in Kildare grew from 32,500 in 1991 to 80,750 in 2016; a 148% increase, although household sizes declined during this time from an average of 3.76 persons to 2.75.

Population Projections

Eastern and Midlands Regional Assembly Regional Economic and Spatial Strategy[xix] Appendix B sets out the possible population projections for Kildare and Meath based on high and low scenarios for two scenario time periods, see Table 7.1.

Table 7.1 Population Projections Meath and Kildare

Local Authority	2016	2026 low-high	2031 low-high
Meath	222,500	249,000-254,000 12 – 14% increase from 2016	259,000-266,500 16 - 20% increase from 2016
Kildare	195,000	216,000-221,000 11 - 13% increase from 2016	225,000-231,500 15 - 19% increase from 2016

The existing population and communities within the SAOI present a challenge to the routeing of a new OHL; the projected population increase will deepen that challenge. Notwithstanding, the increasing population in this area and in the Greater Dublin area in addition to economic growth in Ireland supports the requirement for the reinforcement of the transmission network.

Health

In the Census 2016, 90% of people in Meath and Kildare described themselves as being in Good or Very Good health. The relatively high socio-economic status of the communities in the SAOI is a factor in this; the lower the levels of employment, income and education are associated with worsening determinants of health, in particular healthy life expectancy.

Potential Impacts

As it is EirGrid's policy to avoid residential properties where possible, these towns and linear communities represent a significant constraint on this technological solution. Effects on amenity from OHLs occur during construction and operational phases. Amenity and Health impacts, whether during construction or operation, are considered in relation to local communities and community facilities. Tourism venues, local businesses, agricultural businesses and stud farms are considered further under Section 7.4.2 Economy.

During construction:

- Amenity: potential impacts during construction are the result of combined effects of construction activities leading to reduced amenity and potential health effects as a result of stress and fears; a loss of community cohesion as a result of severance; and reduced access to facilities.
- Health: concerns would centre around the direct 'nuisance effects' of noise, air quality and traffic, both individually and combined to affect amenity, and indirect effects on stress and fears.
    - Air quality: in the form of dust and emissions from plant, machinery and traffic, is only a factor during construction; in the absence of mitigation and control measures, air quality could be an issue for local communities during construction.

- Noise: to piling for foundations and construction traffic. noise effects are most significant close to the OHL, dropping to not significant beyond 200m.
- Traffic is addressed is addressed in Section 7.4.4

During operation,

- Amenity: there are no air quality or traffic related issues from OHL during operation. There is, however, potential for noise from the conductors, which can be worse in wet weather or if the conductors are not clean, to combine with visual impacts to create a significant amenity effect during operation. This depends on the proximity of residential properties to the new OHL, however as noise effects are most significant close to the OHL, dropping to not significant beyond 200m.
- Personal and property rights: visual impacts and effects on special views or landscapes can lead to effects on personal and property rights;
- EMFs: concerns relating to EMFs can lead to increased stress and health issues. EirGrid's design standards require all OHLs to operate to existing public exposure guidelines from ICNIRP and as such there should be no direct effect from EMFs; despite this EMFs are likely to remain a concern for local communities

Colour Coding for MCA

For the new OHL, effects on amenity and health are considered to be moderate-high risk.

Amenity and Health

There would be a moderate-high risk impact during construction, however this solution proposes a new OHL in an area which is heavily constrained by communities and it is likely that it would be routed within 200m of some properties and community facilities. During operation, therefore, there could be an amenity effect from the combined effects of noise and visual impact from the new OHL as well increased anxiety relating to EMFs, potentially leading some stress related health effects.

7.4.2 Economy

Baseline

Industry, Commerce and Employment

There is a broad mix of industries within the SAOI, however 'Commerce' and Professional Services are the most numerous. The percentage of the population who are unemployed or looking for their first job in the settlements is as follows:

- Kilcock – 6.6%;
- Maynooth - 4.9%;
- Clane – 6.9%;
- Naas – 6%;
- Newbridge – 9%; and
- Sallins – 7%.

The national percentage is 7%; Kildare and Meath are also 7%.

There are many commercial and enterprise sites; including retail centres in the main settlements and business parks on the edges of these towns, such as:

- Carton Retail Park, Maynooth;
- the M4 Interchange Business Park, Maynooth;
- Clane Business Park;
- Kildare Business Park;
- Ladytown (Toughers) Business Park; and
- Naas Industrial Estate

Land Use, Agriculture and Equine

In terms of land use, there a number of areas across Kildare and Meath that have been zoned for certain types of development, including a number of business and industrial zones such as Ladytown Business Park between Naas and Newbridge, and a large tourism related zone to the south of Kilcock, where it is proposed to construct an integrated leisure development, including golf course, hotel and tourist accommodation, conference and leisure facilities and equestrian centre, together with limited housing not exceeding 50 dwelling units in total. All of the main settlements have approved applications for Strategic Housing Developments of more than 100 houses, with some developments up to 400 houses. The two substations of Woodland and Dunstown are in relatively remote areas around Two-Mile House and Batterstown, respectively.

The land use within the SAOI is largely agricultural outside of the main settlements; there is one area of commercial peat extraction to the north of Prosperous. All settlements within the SAOI are listed in Section 5.2.2, categorised as large, medium or small towns and illustrated on map 32108AE-MAP-008.

The greatest proportion of land use in the SAOI is for agriculture, with most of this being for pasture (69%). Despite this, only a small percentage of the population (approximately 4%) is employed in the farming business. County development plans are encouraging local farms to diversify into more profitable agri-businesses such as agri-food and horticulture.

There is a large number of equestrian centres and stud farms in the SAOI, including:

- Abbeyfield Farm, Clane;
- Ashfield Stud farm, Donore;
- Clonfert Maynooth Equestrian Centre and Stud Farm;
- Baroda Stud at Greatconnell;
- Castlewarden Pony and Country Club, Straffan;
- Corduff Stud – Goatstown;
- Collistown, near Kilcloon;
- Corbally stud – Toolestown;
- Derrinstown Stud Farm, Maynooth;
- Dunbryne Equestrian Centre, Naas;
- Finsceal Stud Farm, Milltown;
- Grane William Stud – Barrogstown West;
- Iona Park Stud – Newtownmacabe;
- JAG Equestrian Centre, Naas;
- Little Oak Equestrian Centre, Prosperous; and
- Loughtown Stud, Naas;
- Quantum Equestrian, Straffan; and

- Woodville Stud, Newtowndonore

The size and nature of these stud farms and equestrian centres vary; some are of national significance, such as Derrinstown Stud Farm in Maynooth.

Tourism

There are a number of important tourism venues in the SAOI, including castles, racecourses, golf clubs and equestrian centres.

Significant tourism venues in the SAOI include:

- Donadea Demesne – castle and forest park, near Staplestown;
- Maynooth Castle, in the centre of Maynooth, close to the University;
- Mondello Park, Motorsport, Carragh;
- Naas Racecourse, north east of Naas;
- Punchestown Racecourse, Swordlestown, Naas; and
- The Curragh Racecourse, The Curragh, Newbridge.

Lyons Demesne is just outside of the study area, to the south east of Straffan and west of Newcastle, however it has transport links within the study area.

There are numerous golf clubs in Meath and Kildare, including:

- Kilcock Golf Club;
- Carton House – hotel and golf club north of Maynooth;
- The K Club – internationally renowned golf club at Straffan;
- Killeen Golf Club
- Palmerstown House Estate – hotel and golf club, at Johnstown, near Naas;
- Naas Golf Club, Kerdiffstown, Naas;
- Millicent Golf Club, Naas; and
- The Royal Curragh. The Curragh, Newbridge.

All of these venues are important for the economy of the SAOI and more widely as many are used in connection with trips to Dublin or elsewhere in Ireland. Others are international venues in their own right, such as the K Club.

Potential Impacts

Industry, Commerce and Employment

Construction of a new OHL could provide construction jobs locally but there are low levels of unskilled workers in the local small areas within the SAOI and any skilled workers required would most likely have skills specific to the installation of an OHL and be brought into the region from elsewhere.

The timescales for the installation of the OHL is not certain and the numbers of construction workers required are unknown at this stage. However, it is not anticipated they would be in high enough numbers to have a significant

impact in counties with a combined population of more than 400,000, located on the edge of the Greater Dublin area.

Given the nature of the project and specialist nature of the equipment being installed, it is anticipated that most of the capital expenditure would be captured outside of the SAOI, although there is potential for some to be within the local supply chain bringing benefits to local businesses and communities. Other, indirect beneficial effects on the local supply chain would come from construction worker spend (aside from accommodation).

During construction, there may be temporary disruption to traffic and access, impacting commuters and distribution networks.

Land Use, Agriculture and Equine

In operation, the presence of a new OHL may have an impact on potential future development of industrial and commercial land if located in these areas; for example, it could present a height restriction on new business units or may restrict the nature of business carried out. There is potential for this to be avoided during route design however.

There would be minimal disruption to agricultural land; during construction, there would be a temporary land take to allow access for construction vehicles, materials, and construction laydowns and compounds. This would be reinstated following installation. There would be a permanent land take around the footprint of the towers and a permanent wayleave required to allow access for maintenance, however this would be minimal and be designed for use by smaller vehicles such as 4x4s. Existing agricultural activities could continue under the OHLs once constructed.

There are many stud farms in the SAOI; the list of 18 in the Baseline is not an exhaustive list, although it does include most. Some of the stud farms are of international renown, and a number are of national significance. There is concern amongst the racing community in Ireland that the overhead lines could pose a health risk to the horses if they cross grazing land and also that the presence of overhead power lines and pylons would have a visual impact which could affect their businesses. The industry has been strongly opposed to previous proposals to route overhead lines through Kildare to Dunstown substation. In 2014, EirGrid commissioned a 'Review of Research on Livestock and Crops in Relation to Electric and Magnetic Fields from High Voltage Transmission Lines'[xx] . The study concludes that '*Overall, the available scientific evidence summarised in the current report does not provide consistent or convincing evidence that either electric or magnetic fields associated with the Irish electric transmission system may adversely affect the livestock or crops produced on Irish farmlands*.'

Visual impacts are considered in the environmental constraints report; given the existing electrical infrastructure in the area, and the potential for a new OHL to be positioned so that it is routed through an area considered to be 'compatible' with electricity lines, no significant impact is anticipated.

Tourism

There could be benefits from the need for accommodation locally and spending by the workers, however again this would be relatively minor. Given the location and number of tourism venues in the SAOI, it is anticipated that there would be sufficient private rental and tourism accommodation locally to support transient construction workers, without significantly impacting on either.

There is potential for a new OHL to affect tourism venues in the SAOI both during construction and operation; amenity effects during construction may be an issue, and in particular disruption as a result of construction traffic. Visual impacts during operation may affect the quality of the offer from the tourism venues; depending on proximity to the new OHL, there is potential for the new OHL to affect visitor numbers.

Of the venues listed, the K club and Mondello Park offer international sporting fixtures. These venues, the demesnes and the racecourses within the SAOI have the potential to pose a geographical constraint on a new OHL as they are large venues, which may need to be avoided altogether.

Colour Coding for MCA

For the new OHL, effects on the local economy are considered to be a low-moderate effect.

Economy

The effects on economy could be quite mixed, both adverse and beneficial effects are possible. With careful routing to avoid significant industrial, tourism and equine sites, it is not considered that there would be significant adverse effects. On the basis that this is not always possible, a low-moderate risk impact has been identified. Beneficial effects, whilst welcome, are not likely to be significant in the local economy.

7.4.3 Traffic & Transport

Baseline

The SAOI is situated in a strategic transport gateway, with road and rail networks providing access to and from Dublin and the south and west of Ireland. from There are two motorways and numerous national and regional roads within the SAOI, see map 32108AE-MAP-008. There is an upgrade to the M7, including a bypass of Sallins, currently under construction and an upgrade on the M4 from Maynooth to Leixlip planned; no other road schemes are in the pipeline for the SAOI. The Dublin to Limerick and Dublin to Cork rail lines also cross the SAOI and are likely subject to upgrades in the medium term.

The break-down of road types within the study area is as follows:

- Motorway: 98.3km;
- National Roads: 7.8km;
- Regional Roads: 258km; and
- Local Roads: 227km.

For the most part in the project-wide SAOI, and in particular for this technology, major traffic and transport routes are within Kildare county; northern parts of Maynooth and Kilcock are within Meath.

Kildare's CDP reports that many residents of the county commute for employment. A small majority of 60% of those in employment work within the county; of the 40% who travel outside of the county to their job, most (72%) commute to work in Dublin (Dublin City Centre South Dublin, Fingal, Dun Laoghaire Rathdown and Meath). Within the county, there is a significant level of commuting into the north-eastern part where there is a concentration of major employers. Other commuting routes include connections to adjacent towns such as Carlow and Portlaoise in the south of the county. Commuting patterns in Kildare rely heavily on private car transport:

- 66% use private car transport;
- 18% use bus and/or rail; and
- 16% walk or cycle to work, school or college.

Congestion is anecdotally reported across Kildare and in particular in relation to Maynooth, Naas and Newbridge, the largest settlements.

Potential Impacts

Any routing of a new OHL from Woodland to Dunstown would have to cross the Intercity rail lines and M4 and the M7; motorways and railways can be, and often are, over sailed by OHLs, but this would have to be carefully designed and executed to minimise disruption to the motorways and railways lines.

The more challenging issue will be the presence of numerous local roads within the SAOI and the likelihood that these may have to be used to access the construction sites for the new OHL. It would be possible to reduce construction traffic on local roads by the construction of an access track along the length of the proposed OHL route; however, this would involve the temporary use of large stretches of third-party land which EirGrid is seeking to avoid. As such, there could be significant disruption on local roads during the construction phase of the project. Impacts could include: driver and pedestrian delay; increased fear and intimidation for pedestrians, especially where there are no footpaths along the roads being used; and potentially severance of communities, community facilities and businesses if any roads need to close.

There may also be impacts on the condition of the roads from HGVs and Abnormal Loads and the need to remove hedgerows and street furniture to facilitate the transport and delivery of materials. Using the local road network would necessitate a large number of access points to and from the highway which could result in a loss of hedgerows to facilitate visibility splays to ensure the safe access and egress of construction traffic. These would be reinstated following installation, so these would be temporary effects.

Colour Coding for MCA

For the up-voltage of the 220kV, effects on Traffic and Transport are considered to be moderate-high risk.

Traffic and Transport

There is some potential for adverse effects during construction as result of possible traffic and access disruption and temporary effects on the conditions of local roads.

7.4.4 Utilities

Baseline

The new OHL will largely be installed on third party land on greenfield sites. These are unlikely to contain noteworthy underground utilities; however, a full survey would be carried out prior to the commencement of construction. Private water supplies and septic tanks, including any soakaways would be of primary concern in these locations. On previously used or more urban land, it is more likely that there would be underground utilities of note; again, these would be determined during a full survey prior to the commencement of construction.

Above ground utilities in the SAOI include telephone network cables and OHLs. Near to woodland, there is the existing Moneypoint to Woodland 400kV OHL travelling east to west; the Woodland to Maynooth 220kV OHL travelling north to south; and a 100kV OHL crossing to the south of Woodland substation in a north west to south east direction. There are a number of 220kV OHLs connecting into Maynooth substation in addition to the Gorman -Maynooth and Woodland-Maynooth OHLs; and four further 110kV OHLs cross under the 220kV OHL within the SAOI travelling into the greater Dublin area. At Dunstown substation, there is the existing Moneypoint to Dunstown 400kV OHL two additional 220kV OHLs which leave Dunstown and travel south, while a third travels east.

In addition to these, there are many 38kV and lower voltage OHLs criss-crossing the SAOI.

Potential Impacts

There are unlikely to be significant issues with existing utilities for the OHL option, with the possible exception of other OHLs, some of which may need to over sailed be undergrounded to facilitate the new OHL. Third party utility surveys will be undertaken prior to excavation for pylon foundations, thereby removing the risk of UXO, underground cables, water supply pipes or private water sources or wastewater treatment.

Colour Coding for MCA

For the new OHL, effects on utilities are considered to be low.

Utilities

There is some potential for disruption; this would necessarily occur during construction as other utilities may need to be removed or diverted to accommodate the new 400kV OHL.

7.5 Key Social Issues and Evaluation of Technology 2

7.5.1 Summary

Amenity & Health

For the new OHL, effects on amenity and health are considered to be moderate-high risk. There would be a moderate-high risk impact during construction, however this solution proposes a new OHL in an area which is heavily constrained by communities and it is likely that it would be routed within 200m of some properties and community facilities. During operation, therefore, there could be an amenity effect from the combined effects of noise and visual impact from the new OHL as well increased anxiety relating to EMFs, potentially leading some stress related health effects.

Economy

For the new OHL, effects on the local economy are considered to be low-moderate.

The effects on economy could be quite mixed, both adverse and beneficial effects are possible. With careful routing to avoid significant industrial, tourism and equine sites, it is not considered that there would be significant adverse effects. On the basis that this is not always possible, a low-moderate risk impact has been identified. Beneficial effects, whilst welcome, are not likely to be significant in the local economy.

Traffic & Transport

For the up-voltage of the 220kV, effects on Traffic and Transport are considered to be moderate-high risk.

There is some potential for adverse effects during construction as result of possible traffic and access disruption and temporary effects on the conditions of local roads.

Utilities

For the new OHL, effects on utilities are considered to be low.

There is some potential for disruption; this would necessarily occur during construction as other utilities may need to be removed or diverted to accommodate the new 400kV OHL.

7.5.2 Summary Social Impacts Multi-Criteria Assessment of Technology 2

More significant/difficult/risk Less significant/difficult/risk

Table 7.2 Technology 2 Risk Assessment

Topics	Technology 2
Amenity & Health	
Economy	
Traffic & Transport	
Utilities	
Summary	

8. Technology 3: Underground Cable

8.1 Technical Background to the Technology

The cable route is to connect the existing Dunstown 400 kV substation and Woodland 400 kV substation (a route length of approximately 50km). Three potential solutions were identified, investigated and presented in the CP966 Cable Feasibility Report [xxi].

- Option 3A: 220kV UGC (12m cable swathe);
- Option 3B: 400kV UGC (one conductor per phase; single 12m cable swathe); and
- Option 3C: 400kV UGC (two conductors per phase in two separate 12m swathes).

An important aspect of this technology from an environmental constraint and impacts perspective is the method employed to install the cables. There are three different methods that could be employed to install the cables, depending on the nature of ground and local constraints:

- Trenched (sometimes called 'Open Cut':
  - Direct buried cables; and
  - Ducted cables.
- Trenchless:
  - HDD;
  - Deep bore tunnel; and
  - Pipe Jacking/micro tunnels.
- Bespoke cable bridges.

For the majority of the route, the cables would be installed using 'Open Cut'; however, at significant constraints such as rail, major roads, and large rivers or canals, trenchless or bridging techniques may be employed.

In order to install the cables using the 'Open Cut' technique, a temporary working strip or 'swathe' is required to facilitate the construction. This is defined as the area of land required, a cable corridor, for the construction of high voltage UGC. This is far larger than the width of the trench alone as there will be various ongoing construction activities within the temporary working strip, such as:

- Storage of equipment, and materials;
- Storage of the excavated topsoil and subsoil;
- Delivery of cable drums to site
- Excavation of the cable trench;
- Cable drums and accessories deliveries;
- Excavation equipment deliveries;
- Jointing equipment and wellbeing facilities deliveries and removal;
- Specialised backfills deliveries;
- Waste removal; and
- Staff ingress/egress from site.

For the purpose of this study, it is estimated that the swathe would be 12m, both for the 220kV option and the 400kV options.

8.2 Technology 3 Study Area and SAOI

The Technology 3 SAOI for the cables options is the same as for Technology 2 (See Figure 7.2). Within this review of the SAOI, particular attention is given to constraints associated with the highway network because EirGrid's preferred approach to the UGC solutions is to use the existing road network and bury the cables in the roads.

As the SAOI is the same as for Technology 2, the baseline information for each topic is also the same. There is some further detail on the roads network, but otherwise the baselines are the same. The details have been included in this section as well for ease of reference only.

8.3 Assumptions and Limitations

For this technology, the following assumptions have been made:

- Options 3A and 3B both require a 12m swathe and so will be assessed together; there would be no difference in effects between the two;
- Option 3C, the 400kV two core phase will be laid in two separate 12m swathes. As such it is assumed that the effects could be up to twice that of Options 1A and 1B;
- The cable will be installed in sections equal to the length of cable on drum (700m). Welfare facilities and storage area to be provided at the end of each section;
- The cables will be laid using the local road network and will not cross third-party land, except close to the connection at Woodland where it is likely it would have to cross third party lands as the local road network is not large enough to accommodate the 12m swathe;
- It is anticipated that in smaller roads the working strip will only be used where there are hedges or fences either side of the road which can be reinstated;
- There are points along the routes with trees either side where the swathe will be reduced and limited to road surface, the verge either side and storage compounds would be positioned at either end of the section;
- It is not known if the cables can be laid in bridges crossing rivers; it is assumed that this would be utilized wherever possible;
- The cables would be connected into the substation as cables and there would be no requirement for OHL connections and the associated Sealing End Compounds at either end of the route; and
- The rate of installation for the cables is assumed to be 150 to 200m per day; this means, to install 50km it would take up to three years to install a single phase of UGC.

There are limitations to the assessment:

- The routes of the cables are not yet known, although it is assumed, as above that regional roads would be used within the Technology 3 Study Area; and
- The technology that would be deployed to cross constraints such as rivers is not known; it is assumed crossings of large rivers would be trenchless and smaller rivers and ditches by 'open cut' requiring a need for diversions or over-pumping.

8.4 Potential Social Impacts

The various topics are described in terms of baseline and potential impacts on them from the proposed solution. Following this, each topic is considered in the context of risk and EirGrid's colour scheme used to illustrate the potential risk from each constraint for this solution. The assessment combines constraints during construction and operation, assuming construction constraints are temporary.

More significant/difficult/risk Less significant/difficult/risk

This risk scale is clarified by text, as follows:

- High: dark blue;
- Moderate-high: blue;
- Moderate: dark green;
- Low-moderate: green; and
- Low: cream.

8.4.1 Amenity and Health

Baseline

Population

The SAOI is a densely populated area immediately west of Dublin; with a number of towns, as set out in Section 5 of this report. These include the large towns of Newbridge, Naas, and Maynooth – all with populations of above 10,000. Newbridge is the largest of these with a population of 23,000 (2016). Outside of the settlements, much of the population lives in linear communities alongside regional and local roads. In addition to residential populations, these settlements host community facilities such as schools, churches, parks and recreational areas; employment areas; and retail areas. All settlements within the SAOI are listed in Section 5.2.2, categorised as large, medium or small towns and illustrated on map 32108AE-MAP-008.

Figure 8.1 presents the residential properties within the SAOI; the busy nature of the figure indicates the significance of this constraint and the already large population, which is predicted to rise.

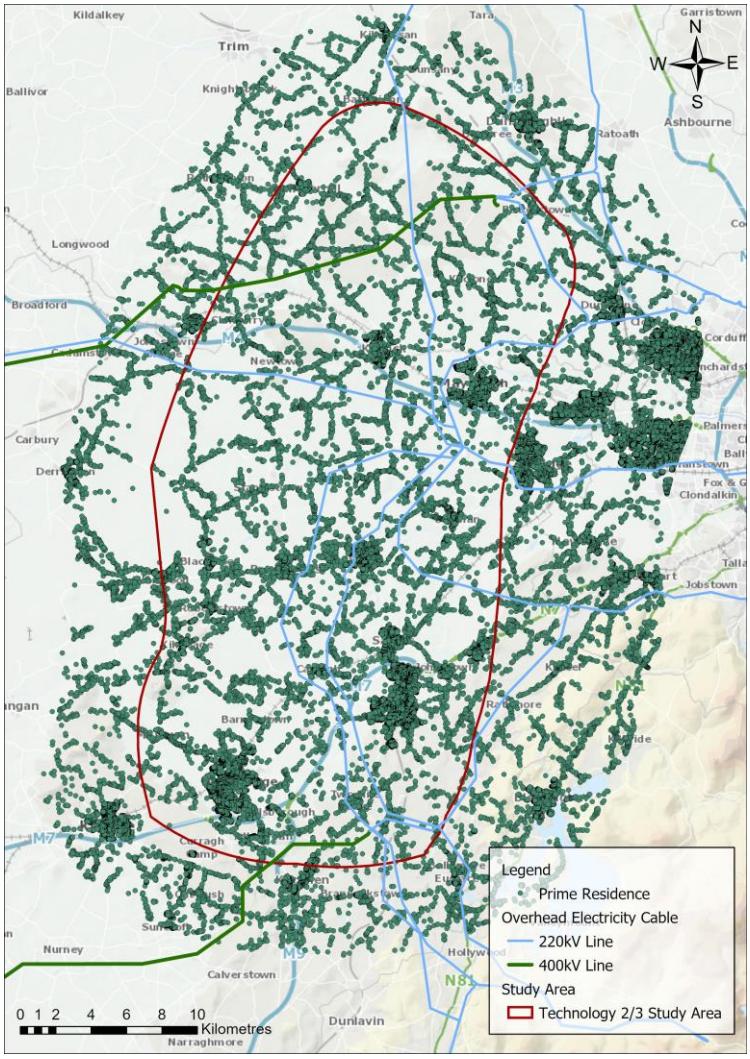


Figure 8.2 Residential Properties in the Technology 2 SAOI

The SAOI does not precisely align with administrative boundaries within the census data; as a proxy for this, statistics for the whole counties of Meath and Kildare have been used to give an indication of the region's performance in key indicators.

Meath

The population of Kildare has increased from 162,831 in 2006 to in 184,135 in 2011 and 195,000 in 2016, representing a growth of 13% to 2011 and 20% to 2016. Over a 25-year period (1991-2016), Kildare experienced an 81.5% increase in its population.

Despite the increase in population in Meath, the number of houeholds in Meath grew only modestly from 62,201 2011 to 64,294 in 2016; a 3% increase, with a very slight increase in the number of persons per household, from 2.96 to 3.

Kildare

The population of Kildare has increased from 186,335 in 2006 to 210,312 in 2011 and 222,500 in 2016, representing a growth of 13% to 2011 and 19% to 2016. Over a 25-year period (1991-2016), Kildare experienced an 81.5% increase in its population.

The most recent increase in population can be explained by high levels of natural increase (birth rate) and a strong performance in net migration. Growth in population has occurred within and around the central towns of Naas, Newbridge, Kildare, Clane and Kilcullen, resulting in a dense pattern of growth along the M7 and M9 motorways. Significant pockets of population growth have also occurred in the north of the county. Populations more than doubled in the rural hinterlands of urban centres like Athy, Naas, Newbridge, Clane and Kilcock and

the village of Caragh. The most populated areas in Kildare are within and close to the main urban settlements of Newbridge, Naas, Celbridge, Leixlip, Maynooth and Athy.

The number of houeholds in Kildare grew from 32,500 in 1991 to 80,750 in 2016; a 148% increase, although household sizes declined during this time from an average of 3.76 persons to 2.75.

Population Projections

Eastern and Midlands Regional Assembly Regional Economic and Spatial Strategy[xxii] Appendix B sets out the possible population projections for Kildare and Meath based on high and low scenarios for two scenario time periods, see Table 8.1.

Table 8.1 Population Projections Meath and Kildare

Local Authority	2016	2026 low-high	2031 low-high
Meath	222,500	249,000-254,000 12 – 14% increase from 2016	259,000-266,500 16 - 20% increase from 2016
Kildare	195,000	216,000-221,000 11 - 13% increase from 2016	225,000-231,500 15 - 19% increase from 2016

Health

In the Census 2016, 90% of people in Meath and Kildare described themselves as being in Good or Very Good health. The relatively high socio-economic status of the communities in the SAOI is a factor in this; the lower the levels of employment, income and education are associated with worsening determinants of health, in particular healthy life expectancy.

Potential Impacts

Potential impacts on amenity would occur during construction only as a result of combined noise, air quality, traffic and visual impacts of construction activities. Amenity impacts on local communities and community facilities are discussed here; potential amenity related impacts on tourism and in some cases local businesses are discussed under the Economy topic.

The existing population and communities within the SAOI present a challenge to installation of cables in the regional road network; the projected population increase will deepen that challenge. Notwithstanding, the increasing population in this area and in the Greater Dublin area in addition to economic growth in Ireland supports the requirement for the reinforcement of the transmission network.

There are generic impacts on amenity and health as a result of the construction of an underground cable, as follows:

During construction:

- Amenity: potential impacts during construction are the result of combined effects of construction activities leading to reduced amenity and potential health effects as a result of stress and fears; a loss of community cohesion as a result of severance if roads were fully or partially; and reduced access to facilities. Effects relating to traffic are covered in Section 8.4.3; and
- Health: concerns would centre around the direct ‘nuisance effects’ of noise, air quality and traffic, both individually and combined to affect amenity, and indirect effects on stress and fears.

- Air quality: in the form of dust and emissions from plant, machinery and traffic, is only a factor during construction; in the absence of mitigation and control measures, air quality could be an issue for local communities during construction.
- Noise: the excavation of trenches along the existing road network could present noise issues; this would be a particular issue for linear communities alongside the regional road network. Construction traffic would also be a potential noise issue.
- Traffic is addressed in Section 8.4.3.

During operation:

- Amenity: there would be no continuing effects on amenity during operation; and
- EMFs: concerns relating to EMFs can lead to increased stress and health issues. EirGrid's design standards require all UGCs to operate to existing public exposure guidelines from ICNIRP and as such there should be no direct effect from EMFs; EMFs related to UGCs are unlikely to be a concern for local communities

In terms of the impacts of different options, Options 3A and 3B would have the same impacts; Option 3C is likely to be twice the level of impact as it covers twice the length of road.

Colour Coding for MCA

For the new UGC, effects on amenity and health are considered to be moderate-high and high risk.

OPTION 3A (220kV UGC (12m cable swathe)	OPTION 3B: 400kV UGC (one conductor per phase; single 12m cable swathe	OPTION 3C (400kV UGC (two conductors per phase in two separate 12m swathes)

There would be a moderate-high risk impact on amenity and health during construction only for options 3A and 3B. Combined impacts on communities, especially those linear communities alongside the regional road networks, could come from dust, noise, traffic and visual impacts. The impact for option 3C will be worse as there are two 'routes' and option 3C was therefore assessed to have a high-risk on amenity and health during construction only.

8.4.2 Economy

Industry, Commerce and Employment

There is a broad mix of industries within the SAOI, however 'Commerce' and Professional Services are the most numerous. The percentage of the population who are unemployed or looking for their first job in the settlements is as follows:

- Kilcock – 6.6%;
- Maynooth - 4.9%;
- Clane – 6.9%;
- Naas – 6%;
- Newbridge – 9%; and
- Sallins – 7%.

The national percentage is 7%; Kildare and Meath are also 7%.

There are many commercial and enterprise sites; including retail centres in the main settlements and business parks on the edges of these towns, such as:

- Carton Retail Park, Maynooth;
- the M4 Interchange Business Park, Maynooth;
- Clane Business Park;
- Kildare Business Park;
- Ladytown (Toughers) Business Park; and
- Naas Industrial Estate

Land Use, Agriculture and Equine

In terms of land use, there a number of areas across Kildare and Meath that have been zoned for certain types of development, including a number of business and industrial zones such as Ladytown Business Park between Naas and Newbridge, and a large tourism related zone to the south of Kilcock, where it is proposed to construct an integrated leisure development, including golf course, hotel and tourist accommodation, conference and leisure facilities and equestrian centre, together with limited housing not exceeding 50 dwelling units in total. All of the main settlements have approved applications for Strategic Housing Developments of more than 100 houses, with some developments up to 400 houses. The two substations of Woodland and Dunstown are in relatively remote areas around Two-Mile House and Batterstown, respectively.

The land use within the SAOI is largely agricultural outside of the main settlements; there is one area of commercial peat extraction to the north of Prosperous. All settlements within the SAOI are listed in Section 5.2.2, categorised as large, medium or small towns and illustrated on map 32108AE-MAP-008.

The greatest proportion of land use in the SAOI is for agriculture, with most of this being for pasture (69%). Despite this, only a small percentage of the population (approximately 4%) is employed in the farming business. County development plans are encouraging local farms to diversify into more profitable agri-businesses such as agri-food and horticulture.

There is a large number of equestrian centres and stud farms in the SAOI, including:

- Abbeyfield Farm, Clane;
- Ashfield Stud farm, Donore;
- Clonfert Maynooth Equestrian Centre and Stud Farm;
- Baroda Stud at Greatconnell;
- Castlewarden Pony and Country Club, Straffan;
- Corduff Stud – Goatstown;
- Collistown, near Kilcloon;
- Corbally stud – Toolestown;
- Derrinstown Stud Farm, Maynooth;
- Dunbryne Equestrian Centre, Naas;
- Finsceal Stud Farm, Milltown;
- Grane William Stud – Barrogstown West;
- Iona Park Stud – Newtownmacabe;
- JAG Equestrian Centre, Naas;
- Little Oak Equestrian Centre, Prosperous;

- Loughtown Stud, Naas;
- Quantum Equestrian, Straffan; and
- Woodville Stud, Newtowndonore

The size and nature of these stud farms and equestrian centres vary; some are of national significance, such as Derrinstown Stud Farm in Maynooth.

Tourism

There are a number of important tourism venues in the SAOI, including castles, racecourses, golf clubs and equestrian centres.

Significant tourism venues in the SAOI include:

- Donadea Demesne – castle and forest park, near Staplestown;
- Maynooth Castle, in the centre of Maynooth, close to the University;
- Mondello Park, Motorsport, Carragh;
- Naas Racecourse, north east of Naas;
- Punchestown Racecourse, Swordlestown, Naas; and
- The Curragh Racecourse, The Curragh, Newbridge.

Lyons Demesne is just outside of the study area, to the south east of Straffan and west of Newcastle, however it has transport links within the study area.

There are numerous golf clubs in Meath and Kildare, including:

- Kilcock Golf Club;
- Carton House – hotel and golf club north of Maynooth;
- The K Club – internationally renowned golf club at Straffan;
- Killeen Golf Club
- Palmerstown House Estate – hotel and golf club, at Johnstown, near Naas;
- Naas Golf Club, Kerdiffstown, Naas;
- Millicent Golf Club, Naas; and
- The Royal Curragh. The Curragh, Newbridge.

All of these venues are important for the economy of the SAOI and more widely as many are used in connection with trips to Dublin or elsewhere in Ireland. Others are international venues in their own right, such as the K Club.

Potential Impacts

Industry, Commerce and Employment

The installation of new UGCs could provide construction jobs locally but there are low levels of unskilled workers in the local small areas within the SAOI and any skilled workers required would most likely have skills specific to the installation of an OHL and be brought into the region from elsewhere.

The timescales for the installation of the UGCs are not certain, however it is considered it would need at least three years to install assuming the two routes for Option Care installed in parallel. The numbers of construction workers required for this are unknown at this stage, however it is not anticipated they would be in high enough numbers to have a significant impact in counties with a combined population of more than 400,000, located on the edge of the Greater Dublin area.

Given the nature of the project and specialist nature of the equipment being installed, it is anticipated that most of the capital expenditure would be captured outside of the SAOI, although there is potential for some to be within the local supply chain bringing benefits to local businesses and communities. Other, indirect, beneficial effects on the local supply chain would come from construction worker spend (aside from accommodation).

During construction, there may be temporary disruption to traffic and access, impacting commuters and distribution networks. This is potentially significant for local businesses; however, the assumption is that only regional roads would be used and only those where there would be space enough such that only one side of the road would be required to be closed at any time. This means there should be no road closures, however there may be delays. Further details on this are provided in Section 8.4.3, Traffic & Transport. Notwithstanding this, there could be a significant impact on businesses and regional distribution networks, particularly in relation to Option C.

Land Use, Agriculture and Equine

The presence of a new UGC in the road is unlikely to have an impact on potential future development of industrial and commercial land. Equally there is little if any likelihood for an impact on agriculture or the equine industry as a result of a new UGC in the regional road network, except for the potential for disruption during construction as a result of traffic effects.

Tourism

There could be benefits from the need for accommodation locally and spending by the workers, however again this would be relatively minor. Given the location and number of tourism venues in the SAOI, it is anticipated that there would be sufficient private rental and tourism accommodation locally to support transient construction workers, without significantly impacting on either.

There is potential for the installation of the new UGC to affect tourism venues in the SAOI during construction only; amenity effects during construction may be an issue, and in particular disruption as a result of construction traffic.

Of the venues listed, the K club and Mondello Park offer international sporting fixtures. There may be timing constraints in relation to construction and tourism venues if major events are planned.

Colour Coding for MCA

For the new UGCs, effects on the local economy are considered to be moderate and moderate-low risk.

OPTION 3A - 220kV UGC (12m cable swathe)	OPTION 3B - 400kV UGC (one conductor per phase; single 12m cable swathe)	OPTION 3C - 400kV UGC (two conductors per phase in two separate 12m swathes)

The effects on economy could be quite mixed, both adverse and beneficial effects are possible. Beneficial effects, whilst welcome, are not likely to be significant in the local economy; disruption to local businesses and tourism venues could have a moderate risk impact as a result of construction works in regional roads over a period of three years. This is especially the case for Option 3C.

8.4.3 Traffic & Transport

Baseline

As with technology 2, the SAOI is situated in a strategic transport gateway, with road and rail networks providing access to and from Dublin and the south and west of Ireland. from There are two motorways and numerous national and regional roads within the SAOI, see map 32108AE-MAP-008. There is an upgrade to the M7, including a bypass of Sallins, currently under construction and an upgrade on the M4 from Maynooth to Leixlip planned; no other road schemes are in the pipeline for the SAOI. The Dublin to Limerick and Dublin to Cork rail lines also cross the SAOI and are likely subject to upgrades in the medium term.

The break-down of road types within the study area is as follows:

- Motorway: 98.3km;
- National Roads: 7.8km;
- Regional Roads: 258km; and
- Local Roads: 227km.

For the most part in the project-wide SAOI, and in particular for this technology, major traffic and transport routes are within Kildare county; northern parts of Maynooth and Kilcock are within Meath.

Kildare's CDP reports that many residents of the county commute for employment. A small majority of 60% of those in employment work within the county; of the 40% who travel outside of the county to their job, most (72%) commute to work in Dublin (Dublin City Centre South Dublin, Fingal, Dun Laoghaire Rathdown and Meath). Within the county, there is a significant level of commuting into the north-eastern part where there is a concentration of major employers. Other commuting routes include connections to adjacent towns such as Carlow and Portlaoise in the south of the county. Commuting patterns in Kildare rely heavily on private car transport:

- 66% use private car transport;
- 18% use bus and/or rail; and
- 16% walk or cycle to work, school or college.

Congestion is anecdotally reported across Kildare and in particular in relation to Maynooth, Naas and Newbridge, the largest settlements.

Potential Impacts

As is set out in the Assumptions, EirGrid's policy of avoiding third party land means that the UGC would be installed in public roads; all of the Options would require a 12m swathe and as such this determines that only the regional road network is likely to be suitable. The numerous local roads within the SAOI would have insufficient width to remain open; in fact, some are as narrow as 4m and so could not accommodate the swathe without requiring additional land to the side of the road. This would affect hedgerows, ditches, historic walls and likely gardens. The proposed approach is that one carriageway would be closed to allow for the installation and traffic management processes used to manage the traffic. Even with traffic management, however, as most people in the SAOI commute to work by private car, there is likely to be driver delay and disruption to commuters and regional distribution networks; there may also be disrupted access to homes, businesses and community facilities as a result of the construction.

On the approach to Woodland substation third party land is likely to be required to be used as there are only local roads in their vicinities; close to Woodland the road is between 4 and 8m wide. These roads could not be used without requiring additional third-party land. This could potentially be provided with pockets of land at the end of cable sections, rather than alongside the cable trench, however the roads themselves would have to be closed for a period of time during the installation. To avoid this, it is assumed that the cables would be installed across third party lands leading into Woodland substation. There could still be some disruption to local road users, but this would be more limited and include road crossings and construction traffic using local road networks if required.

There could also be an issue with increased fear and intimidation relating traffic as a result of HGVs using narrow roads to deliver materials to and from the sites

Any routing from Woodland to Dunstown would have to cross the Intercity rail lines and M4 and the M7; these crossings would have to be carefully designed and executed to minimise disruption to the motorways and railways lines.

There may also be impacts on the condition of the roads from HGVs and Abnormal Loads and the need to remove hedgerows and street furniture to facilitate the transport and delivery of materials. These would be reinstated following installation, so these would be temporary effects.

Colour Coding for MCA

For the new UGC, effects on Traffic and Transport are considered to be moderate-high and high risk.

OPTION 3A - 220kV UGC (12m cable swathe)	OPTION 3B - 400kV UGC (one conductor per phase; single 12m cable swathe)	OPTION 3C - 400kV UGC (two conductors per phase in two separate 12m swathes)

For Options 3A and 3B, there is likely to be a moderate-high risk disruption to traffic on the regional road networks during the three years it would take to install the cables. This would lead to pedestrian and driver delay and potential local severance issues. Option 3C has the potential for a higher risk impact when compared to the level of impacts of Options 3A and 3B.

8.4.4 Utilities

Baseline

There are likely to be a number of underground utilities in the regional road network between Woodland and Dunstown, including other electricity cables; telephone and broadband cables; sewers; and private water supplies.

Potential Impacts

There is likely to be a significant issue with third party. There will be many services, some of which may need to be moved to accommodate the UGC. A third-party utilities survey will be carried out prior to construction commencement.

Colour Coding for MCA

For the new OHL, effects on utilities are considered to be moderate and moderate-high risk.

OPTION 3A - 220kV UGC (12m cable swathe)	OPTION 3B - 400kV UGC (one conductor per phase; single 12m cable swathe)	OPTION 3C - 400kV UGC (two conductors per phase in two separate 12m swathes)

There is some potential for disruption; this would necessarily occur during construction as other utilities may need to be removed or diverted to accommodate the new UGC. Option 3A and 3B would have a moderate risk impact to utilities whilst Option 3C would have a moderate-high risk impact.

8.5 Key Social Issues and Evaluation Of Technology 3

8.5.1 Summary

Amenity and Health

For the new UGC, effects on amenity and health are considered to be moderate-high and high risk. There would be a moderate-high risk impact on amenity and health during construction only for options 3A and 3B. Combined impacts on communities, especially those linear communities alongside the regional road networks, could come from dust, noise, traffic and visual impacts. The impact for option 3C will be worse as there are two 'routes' and option 3C was therefore assessed to have a high-risk a on amenity and health during construction only.

Economy

For the new UGCs, effects on the local economy are considered to be moderate and moderate-low risk. The effects on economy could be quite mixed, both adverse and beneficial effects are possible. Beneficial effects, whilst welcome, are not likely to be significant in the local economy; disruption to local businesses and tourism venues could have a moderate risk impact as a result of construction works in regional roads over a period of three years. This is especially the case for Option 3C.

Traffic & Transport

For the Options 3A and 3B the effects on Traffic and Transport are considered to be moderate-high and high risk. There is likely to be a moderate-high risk disruption to traffic on the regional road networks during the three years it would take to install the cables. This would lead to pedestrian and driver delay and potential local severance issues. Option 3C has the potential for a higher risk impact when compared to the level of impacts of Options 3A and 3B.

Utilities

For the new OHL, effects on utilities are considered to be moderate and moderate-high risk. There is some potential for disruption; this would necessarily occur during construction as other utilities may need to be removed or diverted to accommodate the new UGC. Option 3A and 3B would have a moderate risk impact to utilities whilst Option 3C would have a moderate-high risk impact.

8.5.2 Summary of Social Impacts Multi-Criteria Assessment of Technology 3

More significant/difficult/risk Less significant/difficult/risk

Table 8.2 Technology3 Risk Assessment

Constraint	Option 3A- 220kV UGC (12m cable swathe)	Option 3B- 400kV UGC (one conductor per phase; single 12m cable swathe)	Option 3C - 400kV UGC (two conductors per phase in two separate 12m swathes)
Amenity & Health			
Economy			
Traffic & Transport			
Utilities			
Summary			

9. Summary of Technologies Evaluation

9.1 Summary of Assessments of Technological Solutions

The appraisal of each of the technologies is summarised in Table 9.1. From a social perspective, the highest risk technology is Technology 3, the UGC; specifically, Option 3C, the 400kV two conductors per phase option. This presents the highest risk to the greatest number of social aspects. This risk is during construction only, but the construction phase would be for a minimum of three years. Technologies 1 and 2 present a similar risk to social impacts during construction; Technology 2 would have a higher impact on amenity and health during operation than Technology 1.

Table 9.1 Options Assessment Summary

Topic	Technology 1					Technology 2		Technology 3		
	Up-voltage	1A	1B	1C		New OHL		3A	3B	3C
Amenity & Health										
Economy										
Traffic & Transport										
Utilities										
Summary										

Appendix A. Map

Appendix B. Receptors by Settlement Type

Table 1: Technology 1 Receptors Affecting Small Sized Towns

Small Towns	Community Facility	Enterprise	Environment	Healthcare Facilities	Places of Worship	Recreation	Schools	Social Wellbeing Facilities	Sports Club	Stud Farm	Tourism
Carragh	2		1	1	1		0				1
Kilcloon	1					1	0				2
Ladytown	2				3	2				3	
Rathcoffey	1						0				2
Total	**6**	**0**	**1**	**1**	**4**	**3**	**0**		**0**	**3**	**5**

Table 2: Technology 1 Receptors Affecting Medium Sized Towns

Medium Towns	Community Facility	Enterprise	Environment	Healthcare Facilities	Places of Worship	Recreation	Schools	Social Wellbeing Facilities	Sports Club	Stud Farm	Tourism
Prosperous	1		3		1	2	2				1
Total	**1**	**0**	**3**	**0**	**1**	**2**	**2**		**0**	**0**	**1**

Table 3: Technology 1 Receptors Affecting Large Sized Towns

Large Towns	Community Facility	Enterprise	Environment	Healthcare Facilities	Places of Worship	Recreation	Schools	Social Wellbeing Facilities	Sports Club	Stud Farm	Tourism
Maynooth	6		1	2	3	7	6		0	4	10
Total	**6**	**0**	**1**	**2**	**3**	**7**	**6**	**0**	**0**	**4**	**10**

Table 4: Technologies 2&3 Receptors Affecting Small Sized Towns

Small Towns	Community Facility	Enterprise	Environment	Healthcare Facilities	Places of Worship	Recreation	Schools	Social Wellbeing Facilities	Sports Club	Stud Farm	Tourism
Allenwood	1				1		1				
Brownstown											1
Carragh	2		1	1	1		1				1
Coill Dubh (Blackwood)	1								1		
Johnstownbridge	1			1	1				1		
Kilcloon	1					1	1				2
Ladytown	2				3	2				3	
Milltown	1				3	2				3	
Rathcoffey	1						1				2
Robertstown											
Straffan	1				3	1	1		1	1	5
Summerhill	2			1	2	1	1		3		
Total	**13**	**0**	**1**	**3**	**14**	**7**	**6**		**6**	**7**	**11**

Table 5: Technologies 2&3 Receptors Affecting Medium Sized Towns

Medium Towns	Community Facility	Enterprise	Environment	Healthcare Facilities	Places of Worship	Recreation	Schools	Social Wellbeing Facilities	Sports Club	Stud Farm	Tourism
Athgarvan			1				3		1	1	
Clane	7			3	2	3	3		2		4
Dunboyne	1			1		1	2		1	2	
Enfield	1				1	1	2				
Johnstown	1					1					3
Kilcock	3			2	1	7	4		1	2	
Kilcullen						1			1	1	
Kill	1				1	1	2		1		2
Kilmeage	1				5	1	1				
Prosperous	1		3		1	2	2				2
Sallins	1						1				
Total	**17**	**0**	**4**	**6**	**11**	**18**	**20**		**7**	**6**	**11**

Table 6: Technologies 2&3 Receptors Affecting Large Sized Towns

Large Towns	Community Facility	Enterprise	Environment	Healthcare Facilities	Places of Worship	Recreation	Schools	Social Wellbeing Facilities	Sports Club	Stud Farm	Tourism
Celbridge	1			1	5	3	5	1	2	1	3
Newbridge	2		2	2	3	8	13	2	5	5	1
Maynooth	6		1	2	4	7	8		2	4	10
Naas	10	2		9	3	9	11		6	2	14
Leixlip	2	1	2	5	2	8	3		1		
Total	**21**	**3**	**5**	**19**	**17**	**35**	**40**	**3**	**16**	**12**	**28**

Appendix C. Additional Information

[i] Needs Report, Capital Project 966, EirGrid June 2017 http://www.eirgridgroup.com/site-files/library/EirGrid/Step-1-Needs-Report-Capital-Project-966.pdf
[ii] Options Report Part A, Capital Project 966, EirGrid, December 2017 http://www.eirgridgroup.com/site-files/library/EirGrid/Step-2-Part-A-Options-Report-Capital-Project-966.pdf
[iii] Options Report Part B, Capital Project 966, EirGrid, December 2017 http://www.eirgridgroup.com/site-files/library/EirGrid/Step-2-Part-B-Options-Report-Capital-project-966.pdf
[iv] EirGrid Social Impact Assessment Methodology, EirGrid, 2015
[v] Social Impact Assessment: Guidance for Assessing and Managing the Social Impacts of Projects, IAIA, 2015
[vi] Source: https://www.epa.ie/irelandsenvironment/air/ accessed 16/12/19
[vii] EirGrid Evidence Based Environmental Studies, Study 1: EMF, EirGrid, 2014
[viii] Department of Agriculture, Food and Marine: The Contribution of the Sport Horse Industry to the Irish Economy 2017
[ix] Source: https://www.gov.ie/en/policy/e9ec84-transport/
[x] Source: https://www.gov.ie/en/policy-information/07e507-national-development-plan-2018-2027/
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[xii] Source: https://www.gov.ie/en/publication/ccb2e0-the-climate-action-plan-2019/
[xiii] Source: http://www.smartertravel.ie/content/national-cycle-policy
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[xv] Options Report Part A, Capital Project 966, EirGrid, December 2017 http://www.eirgridgroup.com/site-files/library/EirGrid/Step-2-Part-A-Options-Report-Capital-Project-966.pdf
[xvi] Options Report Part B, Capital Project 966, EirGrid, December 2017 http://www.eirgridgroup.com/site-files/library/EirGrid/Step-2-Part-B-Options-Report-Capital-project-966.pdf
[xvii] 321084AE-REP-005 Overhead Line Feasibility Report, Jacobs January 2020
[xviii] EirGrid Evidence Based Environmental Studies. Study 10: Landscape & Visual. EirGrid. June 2016.
[xix] Regional Economic and Spatial Strategy Eastern and Midlands Assembly, June 2019
[xx] EirGrid Review of Research on Livestock and Crops in Relation to Electric and Magnetic Fields from High Voltage Transmission Lines, 2014 and included as Appendix 2 of the Your Plan Your Say Strategy document.
[xxi] 321084AE-REP-001 CP 966 Cable Feasibility Report, Jacobs, December 2019.
[xxii] Regional Economic and Spatial Strategy Eastern and Midlands Assembly, June 2019