

Environmental Appraisal Report of the Transmission Development Plan 2017-2027



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1. Introduction

EirGrid plc (EirGrid) is the national electricity Transmission System Operator (TSO). In our role as TSO in Ireland, we operate and maintain a safe, secure, reliable, economical and efficient transmission system. We develop, with due regard for the environment, key infrastructural projects which are vital for the socio-economic development of the State.

The Transmission Development Plan (TDP) 2017-2027 presents all the transmission projects that are currently progressing for the period 2017-2027. It is likely that, given the continuously changing nature of electricity requirements, new developments will emerge that could impact the plan as presented. These changes will be identified in future studies and accommodated in future development plans which will also be subject to an Environmental Appraisal.

This Environmental Appraisal Report (EAR) has been prepared to ensure that the TDP 2017-2027 is in accordance with the provisions of the adopted Strategic Environmental Objectives as detailed in the Strategic Environmental Assessment (SEA) for the Grid25 Implementation Programme (IP) 2011-2016.

The Grid25 IP 2011-2016 was subject to SEA (Directive 2001/42/EC of the European Parliament and of the Council of Ministers, of 27 June 2001, on the Assessment of the Effects of Certain Plans and Programmes on the Environment) and Appropriate Assessment under the provisions of Article 6(3) of the EU Habitats Directive (Directive 92/43/EEC).

A commitment of the SEA was to conduct an environmental appraisal of each subsequent TDP, to identify any updates to these documents since the publication of the Grid25 IP and to assess ongoing monitoring measures and targets as set out in the SEA. This process is illustrated in Figure 1.1.

A commitment of the SEA (2012) was also to conduct a review of any new Grid Implementation Plan. The 2011-2016 Plan has reached the end of its life cycle and a new Grid Implementation Plan (IP) based on the updated Grid strategy (Ireland's Grid Strategy- Your Grid, Your Tomorrow, 2017, updated environmental policies and objectives is currently in draft. The (draft) IP also includes projects from the 2016 and 2017 TDP likely to be undertaken over the next 5/6 years. Strategic Environmental Assessment and Appropriate Assessment are being undertaken for the new implementation plan and will published for public consultation in early 2018.

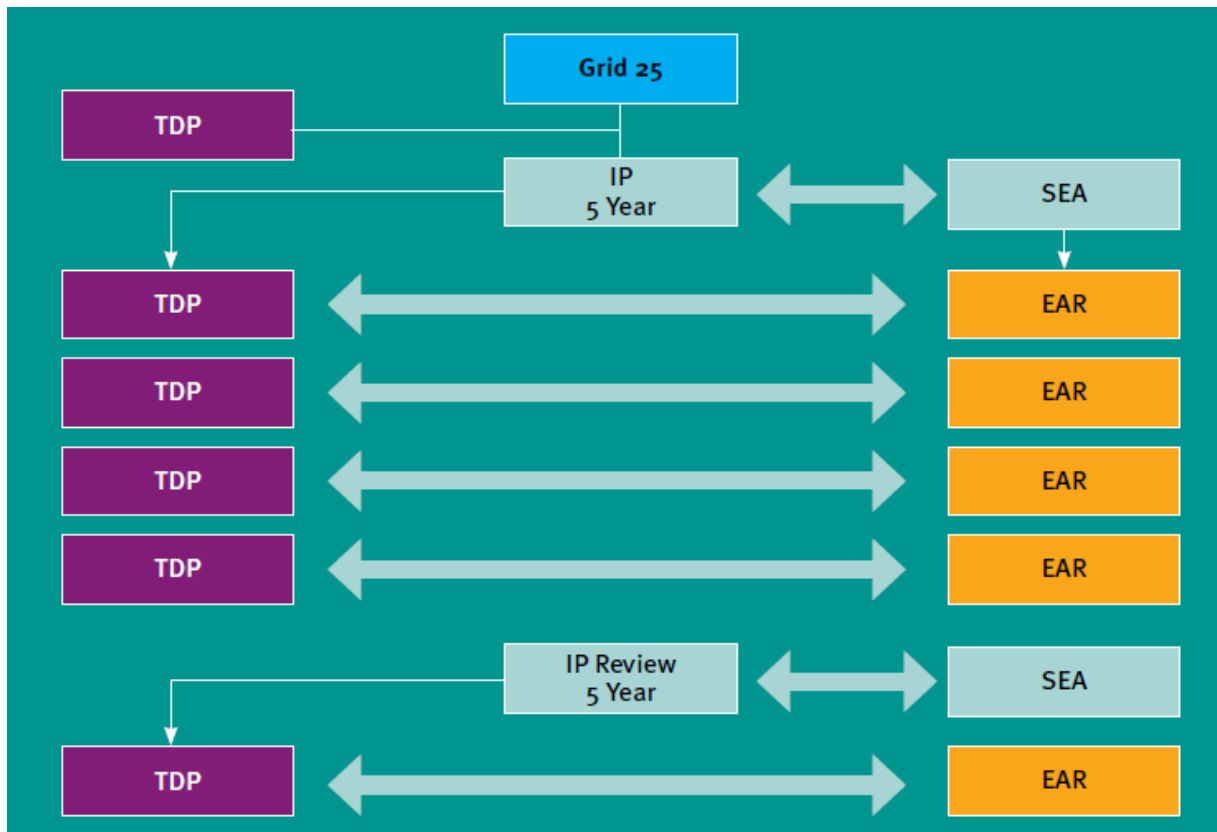


Figure 1.1 Process of Environmental Appraisal of TDPs

2. Update on Projects in TDP 2017-2027

To ensure adequate security of electricity supply, further market integration, and the integration of renewable energy sources, it is necessary to provide ongoing and timely reinforcement of the Irish electricity transmission system. These reinforcement needs can be divided into the following categories:

- Reinforcements to support changes in, or connection of new, demand;
- Reinforcements required to support changes in, or connection of new, generation;
- Reinforcements related to interconnection;
- Reinforcements to facilitate inter-regional power flows; and
- Reinforcements to address the condition of existing assets.

There were 116 active projects in TDP 2016. Since then 18 projects have been completed and 34 new projects have been added to the transmission development plan. These are listed in Tables 3.3-3.5 and in Appendix 1.

The TDP 2017-2027 includes 131 projects that are currently in progress. These projects are categorised as either “New Build”, “Uprate/Modify” or “Refurbish/Replace” projects.

Table 2.1 summarises the 131 (active) projects into their respective categories as detailed in TDP 2017-2027. Over 60% of projects relate to existing assets i.e. Uprate/Modify or Refurbish/Replace projects.

New Build projects: Projects that involve the construction of new stations or new circuits. This category also includes projects that involve the installation of new equipment in existing stations.

An example of a new build project is the installation of new transformers or new reactive support devices within existing stations.

Uprate/ Modify projects: Projects that involve the uprating of existing assets. An example of an uprate project is changing equipment to increase the capacity rating of circuits or busbars. This can include changing the overhead line (conductor) with a more efficient and higher ‘rated’ conductor.

This category also includes projects that involve the modification of existing assets. An example of a modification project is the installation of new couplers or new bays in existing stations. Reconfiguration of existing stations is also included in this category.

Refurbish/ Replace projects: Projects that involve the maintenance of existing stations or existing circuits. This category also includes projects that involve the replacement of existing assets. For example, the replacement of stations at or close to the end of their useful life or replacement and upgrading of protection in existing stations.

Project Category	No of Projects
New Build	40
Uprate/Modify	59
Refurbish/Replace	28
Other	4
Total	131

Table 2.1 Summary of Active Projects by Category TDP 2017-2027

3. Examination and Evaluation of New Projects against Strategic Environmental Objectives

3.1 Strategic Environmental Objectives

The SEA of the Grid25 IP set out ten Strategic Environmental Objectives (SEOs). As this is the current, adopted SEA, it is these SEOs that are the benchmark for the appraisal. It should be noted that the SEA of the next iteration of the Grid IP (2017-2021 *in prep*) builds on these original SEOs.

SEOs are methodological measures against which the potential environmental effects of the TDP can be examined. The SEOs are set out under a range of environmental topics (see Table 3.1). The SEOs guide sustainable Grid development and are used as standards against which the provisions of the TDP can be evaluated. This is in order to help identify areas in which potential significant impacts may occur. The new projects as set out in the TDP 2017-2027 are evaluated against these SEOs in Section 3.3.

SEO Code	Strategic Environmental Objective (Grid 25 Implementation Plan 2011-2016)
B1	To ensure compliance with the Habitats Directive with regard to the protection of Natura 2000 Sites and Annexed habitats and species ²
B2	To ensure compliance with Article 10 of the Habitats Directive with regard to the management of other environmental features – which by virtue of their linear and continuous structure or they function, act as stepping stones – which are of major importance for wild fauna and flora and essential for the migration, dispersal and genetic exchange of wild species
B3	To avoid significant impacts on relevant habitats, species, environmental features or other sustaining resources in Wildlife Sites ³
L1	To avoid significant adverse impacts on the landscape, especially with regard to those arising from impacts on the factors which comprise the Landscape

SEO Code	Strategic Environmental Objective (Grid 25 Implementation Plan 2011-2016)
	Constraints Rating Map ⁴
CH1	To avoid unauthorised impacts upon archaeological heritage (including entries to the RMP) and architectural heritage (including entries to the RPSs)
C1	To help to facilitate the achievement of higher level government targets contained in the Government's Energy White Paper Delivering a Sustainable Energy Future for Ireland – the Energy Policy Framework 2007-2020 and relating to the Kyoto Protocol
HH1	Minimise proximity of development to concentrations of population in order to reduce actual and perceived environmental effects
W1	To prevent impacts upon the status of surface waters in line with the recommendations outlined in the River Basin Management Plans
W2	To prevent pollution and contamination of groundwater in line with the recommendations outlined in the River Basin Management Plans
MS1	To minimise effects upon the sustainable use of land, mineral resources and soil
	<ul style="list-style-type: none"> · 'Annexed habitats and species' refers to those listed under Annex 1, II and IV of the EU Habitats Directive and Annex I of the EU Birds Directive · 'Wildlife Site' is as defined in the Planning and Development Act 2000 · The Landscape Constraints Rating mapping factors are: <ul style="list-style-type: none"> *Elevation > 200m; *Forestry landcover areas; *Slope > 30 degrees *Lakes and estuaries; and

SEO Code	Strategic Environmental Objective (Grid 25 Implementation Plan 2011-2016)
*Other Natural Landcover Types	

Table 3.1: Strategic Environmental Objectives as set out in the Grid 25 IP 2011-2016 SEA

3.2 Planned Network Developments- Regional Perspective

Planned projects are categorised under three broad planning areas as per Figure 3.1. Planned Network Developments are presented in Figure 3.2 (taken from TDP 2017-2027).

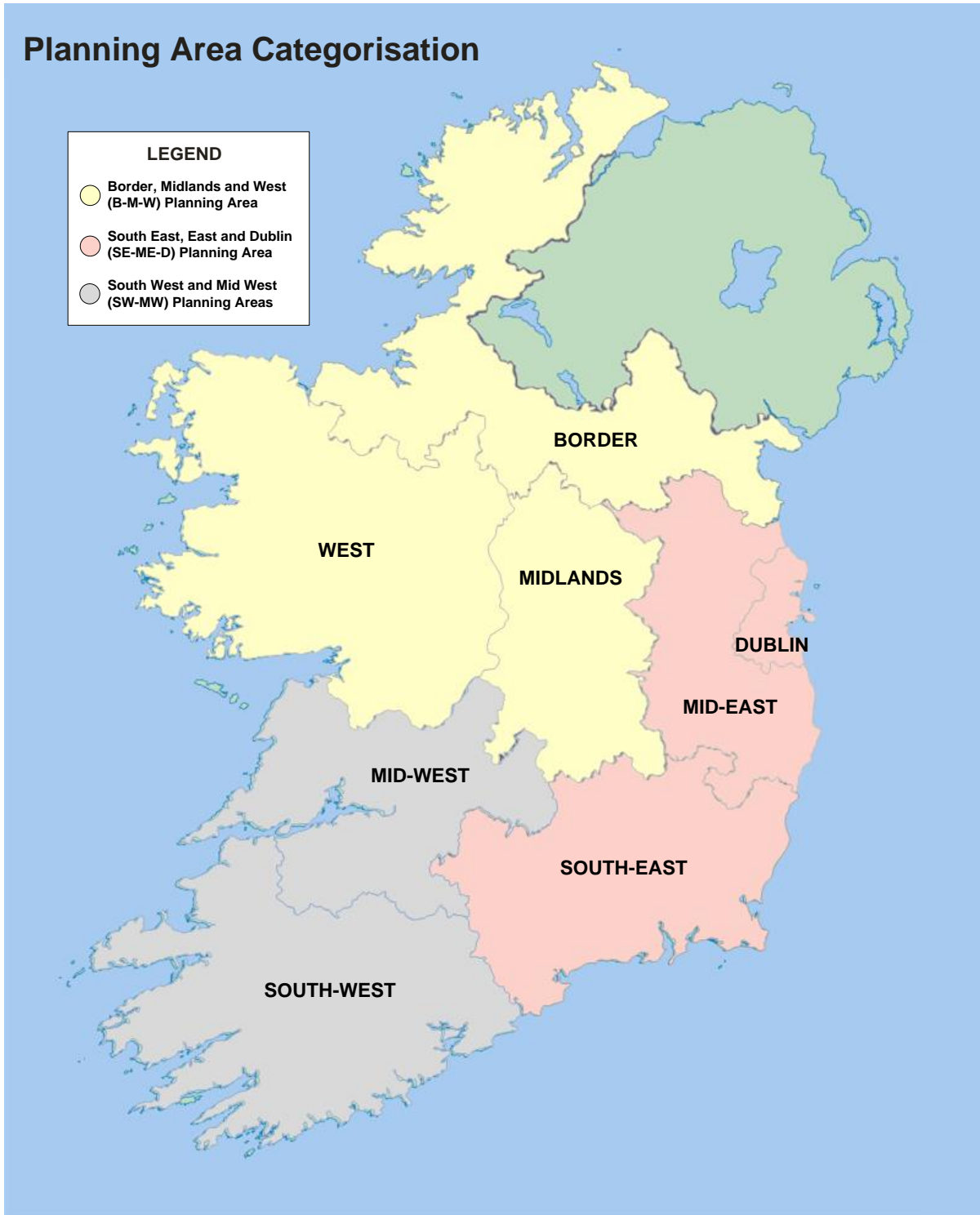


Figure 3.1 Illustration of the three Planning Areas

**Transmission System: 400 kV, 275 kV, 220 kV and 110 kV
 Indicating Developments in Phase 2 (i.e. Outline Design, EIA or
 Public Planning Phase) as at March 2017**

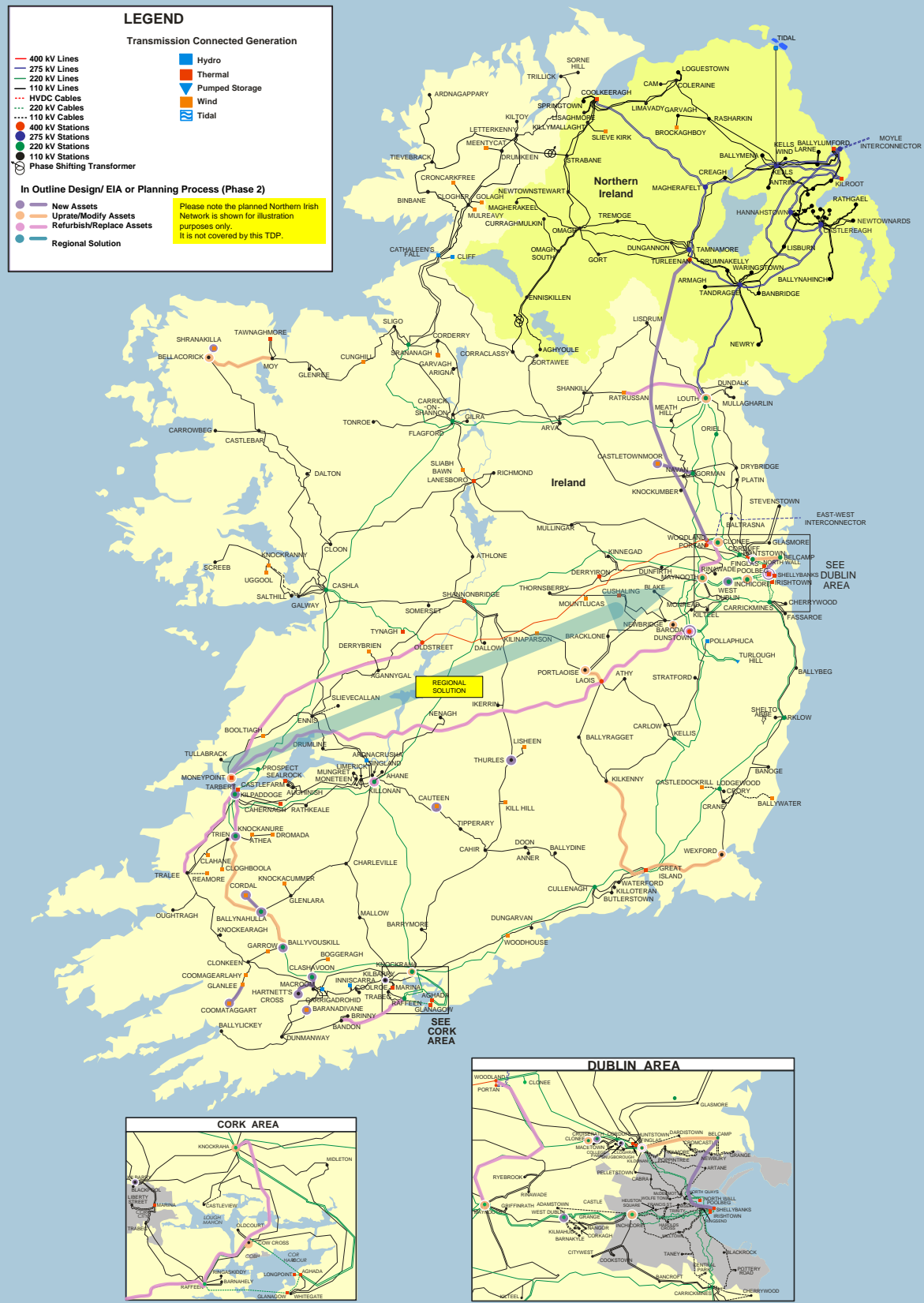


Figure 3.2 Planned Network Developments (From TDP 2017-2027)

A summary of active projects per region is presented in Table 3.2. Sections 3.2.1 to 3.2.3 examine new projects (i.e. projects not listed in the previous TDP 2016-2026) on a regional basis. High level environmental sensitivities are outlined for each region and likely issues arising in each area are presented as defined in the Grid25 IP Environmental Report.

Active Projects by Planning Area	
Planning Area	No. of Active Projects
Border, Midlands and West (B-M-W)	36
South-West and Mid-West (SW-MW)	50
South-East, Mid-East & Dublin (SE-ME-D)	40
National Projects ¹	5
Total	131

Table 3.2 Summary of Active Projects by Planning Area

3.2.1 Border, Midlands and West Planning Area

The Border, Midlands and West planning area is made up of the following counties categorised by region:

- The Border: Donegal, Sligo, Leitrim, Cavan, Monaghan and Louth
- The Midlands: Longford, Westmeath, Offaly and Laois
- The West: Mayo, Galway and Roscommon

Within the Border, Midlands and West Planning Area there are 8 new projects in TDP 2017-2027 that were not considered in TDP 2016-2026. These projects are listed in Table 3.3. Two of these projects are proposed uprate/modification projects related to the integration of renewable energy to the Grid. Galway station needs to be uprated to cater for increased power flows driven by the connection of new generation in the area. A project to connect from Knockranny 110 kV Station to Knockalough Wind Farm is underway. A refurbishment of the Louth-Rathrussan 110KV line is also proposed. Three of the new projects in this area are not related to upgrading of the transmission system, rather they are simply line diversions for accommodating other land use conflicts. The Derryfrench Tynagh 110kV line will be retired and dismantled.

¹ These involve multiple individual projects at various locations across the country.

Environmental Sensitivities

The Border region contains some of Ireland’s most important energy resources as well as high concentrations of environmental sensitivities.

In the Midlands area, environmental sensitivities increase along a diagonal axis from a very robust south-east to an increasingly sensitive north-west due to the presence of the Shannon system of rivers, lakes and wetlands.

The West area contains some of the country’s highest concentrations of environmental designations – many of international and national significance.

Likely Issues Arising

For line uprate/ modification projects and refurbishment projects, potential environmental issues can occur if works are required within ecologically sensitive areas. The projects listed in Table 3.3 do not occur within areas of ecological sensitivity and no significant environmental issues are considered likely to occur in delivering these projects.

The public planning and appropriate assessment requirements for each project will be determined and prepared in accordance with best practice.

CP No	Project Title	Project Type	ECD ²
CP0905	Louth – Ratrussan 110 kV No. 1 Line Refurbishment	Refurbish/replace	2019
CP0895	Knockranny 110 kV Station – Knockalough Wind Farm connection	Uprate/modify	2017
CP0906	Derryfrench – Tynagh 110 kV Line Retirement	Refurbish/replace	2018
CP0871	Galway 110 kV Station – Busbar Uprate and	Uprate/modify	2022

² Estimate completion date as at the data freeze date.

CP No	Project Title	Project Type	ECD ²
	Refurbishment		
CP0913	Flagford – Sligo 110 kV Line – Conflict, N4 Road Realignment	Other	2017
CP0916	Flagford – Srananagh 220 kV Line – Conflict, N4 Road Realignment, New 220 kV Intermediate Tower	Other	2017
CP0974	Cloon – Lanesboro 110 kV Line - Diversion	Other	2017
CP0903	Cloon – Lanesboro 110 kV Line Refurbishment	Refurbish/replace	2020

Table 3.3: New Projects in the Border, Midlands and West Areas (extracted from the TDP 2017-2027)

3.2.2 South-West and Mid-West Planning Area

The South-West and Mid-West planning area is made up of the following counties categorised by region:

- The South-West: Kerry and Cork
- The Mid-West: Clare, Limerick and North Tipperary

Within the South-West and Mid-West Planning area, there are 14 new projects detailed in the TDP 2017-2027. Of these, six projects are new build, four are uprates/modifications and four are refurbishment/replacement. These projects are detailed in Table 3.4. The proposed new build projects include the installation of new equipment within or adjacent to existing 400kV substations at Moneypoint and Oldstreet. Security of supply is the primary driver of these projects. Two of the new build project relate to windfarm connections to integrate renewables onto the Grid. The requirement for a new 110kV station has been identified at the Kilbarry sub station site complex. The requirement for a subsea cable connection between Moneypoint and Kilpaddoge (Cross Shannon) has been identified as part of the reinforcement of this area to

accommodate increased renewable integration. Of the uprate/modify projects, all four involve works within existing substations. Three transmission line refurbishments are planned for this region, with a station uprate also required for the Bandon 110kV station.

Environmental Sensitivities

In the South-West area in general, sensitivity increases towards the coastal areas, with increased sensitivity along the major rivers that cross this area. The Mid-West area contains a number of very sensitive landscapes. For example, the Burren would be very sensitive to development. The Hills of Clare also contain extensive areas of sensitivity and significance. The Shannon Estuary and the Lower Shannon contain highly sensitive and significant ecological, cultural and scenic resources.

Likely Issues Arising

In the South-West area, potential conflicts could occur in the development of new infrastructure or uprating of existing lines where routes cross ecologically and scenically sensitive areas – principally located on bog landscapes – but also in upland, lake, wetland and river habitats. There is a high concentration of Natura 2000 sites located in the South and Mid-West and in the absence of sensitive routing, difficulties could emerge with regard to meeting the provisions of the Habitats Directive. The proposed cross Shannon undersea cable will require consideration under the provisions of Article 6 (3) of the Habitats Directive (Appropriate Assessment).

The public planning and appropriate assessment requirements for each project will be determined and prepared in accordance with best practice.

CP No	Project Title	Project Type	ECD
CP0606	Knockacummer 110 kV station – Knockacummer Wind Farm Permanent Connection	New Build	2017
CP0902	Tarbert – Trien 110 kV No. 1 Line Refurbishment	Refurbish/ Replace	2019
CP0988	Ennis 110 kV Station – Uprate Three Circuit Breakers	Uprate/ Modify	2017
CP0973	Knockraha Short Circuit Rating Mitigation	Uprate/ Modify	2020

CP No	Project Title	Project Type	ECD
CPo868	Knockraha – Raffeen 220 kV Line Refurbishment	Refurbish/ Replace	2018
CPo983	Glanagow 220 kV Station - Point on Wave Controller	Uprate/ Modify	2018
CPo949	New 110 kV Station near Kilbarry	New build	2020/2025
CP1015	Bandon 110 kV Station – Protection Upgrade	Refurbish/ Replace	2018
CPo904	Bandon – Raffeen 110 kV No. 1 Line Refurbishment	Refurbish/ Replace	2019
CPo967	Moneypoint 400 kV Station Series Capacitor	New build	2022
CPo932	Coomataggart 110 kV Station – New Station	New build	2019
CPo991	Kilpaddoge 110 kV Station – Connection of Kelwin Power Plant	Uprate/ Modify	2017
CPo970	Cross-Shannon 400 kV Cable	New build	2023
CPo969	Oldstreet 400 kV Station Series Capacitor	New build	2022

Table 3.4: New projects in the South-West and Mid-West areas (extracted from the TDP 2017-2027)

3.2.3 South-East, Mid-East and Dublin Planning Area

The South-East, Mid-East and Dublin planning area is made up of the following counties categorised by region:

- The South-East: South Tipperary, Waterford, Wexford, Kilkenny and Carlow
- The Mid-East: Wicklow, Kildare and Meath
- Dublin

Within the South East, Mid-East and Dublin Planning Area, there are 12 new projects detailed in the 2017-2027 TDP. Five new build projects are proposed, one of which includes the installation of new equipment at an existing station, two are related to demand connections, one wind farm connection is proposed and a new cable in Dublin linking Shellybanks to Belcamp stations is proposed. Six uprate/modify projects are detailed in Table 3.5 four of which are within existing sub stations and two 110kV line uprates are proposed in the South East.

Environmental Sensitivities

The environmental resources of the South-East comprise upland areas, river valleys and coastal areas. The lowlands generally have a high capacity to sustainably absorb development.

In the Dublin and Mid-East areas there is a mixture of areas of environmental sensitivity and areas with high levels of urbanisation. Extensive areas of industrial peatlands are located in the midlands, there are extensive upland areas and forestry in the south-east and the coast contains areas of ecological, scenic and cultural significance.

Likely Issues Arising

There is a low potential for any significant effects to arise given the nature of the projects and the known environmental sensitivities of the area. Most of the proposed projects are related to existing transmission assets and a number of underground cable projects are proposed for demand/ wind connections.

The public planning and appropriate assessment requirements for each project will be determined and prepared in accordance with best practice.

CP No	Project Title	Project Type	ECD
CPo8o8	Maynooth 220 kV Station Reconfiguration	Uprate/Modify	2025
CPo844	Great Island - Wexford 110 kV Uprate	Uprate/Modify	2020
CPo945	Great Island - Kilkenny 110 kV Uprate	Uprate/Modify	2019

CP0984	Shellybanks - Belcamp 220 kV New Cable	New build	2019
CP0998	Dunstown 400 kV Station - DC System	Refurbish/replace	2019
CP0995	Clonee 220 kV Station – Station Extension	Uprate/Modify	2018
CP0997	Cruiserath 220 kV New Station –New Demand Connection	New build	2017
CP0987	Snugborough 110 kV New Station, New Demand Connection	New build	2018
CP0908	Castletownmoor 110 kV New Station – Castletownmoor Wind Farm Connection	New build	2018
CP0999	Cauteen 110 kV Station – New Wind Farm Connections	Uprate/Modify	2020
CP0968	Dunstown 400 kV Station Series Compensation	New build	2022
CP0972	Wexford 110 kV Station - Busbar Uprate	Uprate/Modify	2020

Table 3.5: New projects in the South-East, Mid-East and Dublin areas (extracted from the TDP 2017-2027)

3.3 Evaluation of Planned Network Developments (new to TDP 2017-2027) against Strategic Environmental Objectives

As detailed in Tables 3.3-3.5, there are three types of new reinforcement projects in the TDP 2017-2027 – new builds, refurbishment/replacement projects and uprate/modifications projects.

The integration of renewable energy sources is a key driver in new projects detailed for the Border, Midlands and West planning area and the South West and Mid-West planning area. This will be achieved through new build, uprate/modification and refurbishment projects. This key driver is in accordance with SEO C1 (to help facilitate the achievement of higher government targets in relation to Energy policy) and is likely to continue improve this SEO in the longer term.

By making improvements to the existing transmission system through upgrades/modifications and refurbishment/replacements, potential impacts to the receiving environment can be minimised. The utilisation of existing assets would have a neutral impact on SEOs related to landscape (L1), ecological connectivity (B2), population centres (HH1) and sustainable land use (MS1). Potential issues can arise where (existing) transmission infrastructure assets are located in sensitive areas such as sites designated for nature conservation (B1, B3), areas of significance for cultural heritage (CH1) and or sensitive water catchments (W1, W2). In general, these issues can be identified early in the project planning process and mitigation measures developed to ensure that no significant effects arise.

The impact of any new build project is a function of the project type and the sensitivities of the environment in which it is to be developed. There is the potential for impacts on a range of environmental factors. However, with proper planning and robust environmental assessment, significant effects (and conflicts with SEOs) can be mitigated in the vast majority of cases. Certain new build projects have the potential to conflict with the SEO related to landscape. The application of mitigation through avoidance (of sensitive landscape areas), sensitive routing and screening may not be sufficient in all instances to remove significant effects on localised landscapes. A high level review of the new projects listed on the 2017-2027 TDP indicates that there is unlikely to be any potential for significant residual impacts post mitigation for any of the new build projects.

Table 3.6 summarises the evaluation of SEOs against the three different types of reinforcement projects. Mitigation measures as detailed in the SEA Environmental Report, which remain relevant for this environmental appraisal of the TDP, are presented in Appendix 2.

Reinforcement Type	Likely to improve status of SEOs	Neutral impact on status of SEOs	Potential conflict with status of SEOs –mitigation possible to avoid significant effects	Potential conflict with status of SEOs – potential for significant residual impacts (post mitigation)
New Build	C1		B1, B2, B3, CH1, HH1, W1, W2, MS1	
Refurbish/ Replace	C1	L1, B2, HH1, MS1	B1, B3, W1, W2 CH1	
Uprate/ Modify	C1	L1, B2, HH1, MS1	B1, B3, W1, W2, CH1	

Table 3.6: Summary evaluation of planned network developments (new to TDP 2017-2027) in relation to Strategic Environmental Objectives (SEA of Grid 25 IP 2011-2016)

All new build projects will be subject to environmental assessment as part of the planning process for these projects.

Refurbishment/replacement and uprate/modification projects are generally considered to be exempted development under Sections 4(1)g and 4(1)h of the Planning and Development Act. Where there is potential for significant effects on a European Site, this exempted development status is lost and planning permission must be sought, accompanied by a Natura Impact Statement. As a Public Authority, we undertake screening for Appropriate Assessment for all planned network developments.

4 Conclusion

The TDP 2017-2027 has been examined in terms of the provisions of the SEA of the Grid25 Implementation Programme. Thirty three new projects are detailed in TDP 2017-2027 TDP since the adoption of TDP 2016-2026. Therefore, to ensure consistency with the provisions of the most recent SEA (2011-2016), these projects have been examined against the strategic environmental objectives as detailed in the Environmental Report (2012). These projects consist of new builds (stations, additional infrastructure within stations and cable connections), refurbishment/replacement projects and uprates/modification projects of existing assets.

These three categories of projects (as they relate to the project listed) have been assessed against the Strategic Environmental Objectives from the SEA and it has been determined that following the implementation of mitigation measures the SEOs will be achieved. It is noted that a revised (draft) Grid Implementation Plan, SEA and Natura Impact Statement is being finalised and that it builds on the original SEOs.

Environmental assessments, as part of Environmental Reports or Environmental Impact Assessments in respect of specific projects, will seek to minimise and where possible avoid significant effects on the natural environment and landscape.

Appendix 1: New Projects in TDP 2017-2027

This table contains the New Projects in TDP 2017-2027 (new since adoption of TDP 2016-2026)

CP No	Project Title	Project Type	ECD
CP0905	Louth – Ratrussan 110 kV No. 1 Line Refurbishment	Refurbish/replace	2019
CP0895	Knockranny 110 kV Station – Knockalough Wind Farm connection	Uprate/modify	2017
CP0906	Derryfrench – Tynagh 110 kV Line Retirement	Refurbish/replace	2018
CP0871	Galway 110 kV Station – Busbar Uprate and Refurbishment	Uprate/modify	2022
CP0913	Flagford – Sligo 110 kV Line – Conflict, N4 Road Realignment	Other	2017
CP0916	Flagford – Srananagh 220 kV Line – Conflict, N4 Road Realignment, New 220 kV Intermediate Tower	Other	2017
CP0974	Cloon – Lanesboro 110 kV Line - Diversion	Other	2017
CP0903	Cloon – Lanesboro 110 kV Line Refurbishment	Refurbish/replace	2020
CP0606	Knockacummer 110 kV station – Knockacummer Wind Farm Permanent Connection	New Build	2017
CP0902	Tarbert – Trien 110 kV No. 1 Line Refurbishment	Refurbish/ Replace	2019
CP0988	Ennis 110 kV Station – Uprate Three Circuit Breakers	Uprate/ Modify	2017

CP No	Project Title	Project Type	ECD
CP0973	Knockraha Short Circuit Rating Mitigation	Uprate/ Modify	2020
CP0868	Knockraha – Raffeen 220 kV Line Refurbishment	Refurbish/ Replace	2018
CP0983	Glanagow 220 kV Station - Point on Wave Controller	Uprate/ Modify	2018
CP0949	New 110 kV Station near Kilbarry	New build	2020/2025
CP1015	Bandon 110 kV Station – Protection Upgrade	Refurbish/ Replace	2018
CP0904	Bandon – Raffeen 110 kV No. 1 Line Refurbishment	Refurbish/ Replace	2019
CP0967	Moneypoint 400 kV Station Series Capacitor	New build	2022
CP0932	Coomataggart 110 kV Station – New Station	New build	2019
CP0991	Kilpaddoge 110 kV Station – Connection of Kelvin Power Plant	Uprate/ Modify	2017
CP0970	Cross-Shannon 400 kV Cable	New build	2023
CP0969	Oldstreet 400 kV Station Series Capacitor	New build	2022
CP0808	Maynooth 220 kV Station Reconfiguration	Uprate/Modify	2025
CP0844	Great Island - Wexford 110 kV Uprate	Uprate/Modify	2020
CP0945	Great Island - Kilkenny 110 kV Uprate	Uprate/Modify	2019

CP No	Project Title	Project Type	ECD
CP0984	Shellybanks - Belcamp 220 kV New Cable	New build	2019
CP0998	Dunstown 400 kV Station - DC System	Refurbish/replace	2019
CP0995	Clonee 220 kV Station – Station Extension	Uprate/Modify	2018
CP0997	Cruiserath 220 kV New Station –New Demand Connection	New build	2017
CP0987	Snugborough 110 kV New Station, New Demand Connection	New build	2018
CP0908	Castletownmoor 110 kV New Station – Castletownmoor Wind Farm Connection	New build	2018
CP0999	Cauteen 110 kV Station – New Wind Farm Connections	Uprate/Modify	2020
CP0968	Dunstown 400 kV Station Series Compensation	New build	2022
CP0972	Wexford 110 kV Station - Busbar Uprate	Uprate/Modify	2020

Table A1.1: **New** Projects in TDP 2017-2027

Appendix 2:

Mitigation Measures (from SEA of Grid 25 IP 2011-2016)

Mitigation Measure Code	Mitigation Measure Title	Status update
EMM1	Full Integration of Planning and Environmental Considerations in EirGrid's Transmission System Planning	<p>Has already occurred; changes will continue to be implemented.</p> <p>A new Framework for Grid Development has been developed. The new approach to developing the grid provides a six-step "end-to-end" structure for all our transmission projects – not just our major projects. It ensures an appropriate balance between technical, economic, environmental, social and community considerations, with significant provision for stakeholder engagement at all stages.</p>
EMM2	Preparation of Strategic Environmental Constraints Mapping	<p>Complete.</p> <p>Will be updated on an ongoing basis, as appropriate, to include most up-to-date, relevant environmental data.</p>
EMM3	Preparation of Evidence-based Environmental Guidelines	Evidence based environmental studies complete and guidelines for EMF, Cultural Heritage and Ecology have been prepared.

Mitigation Measure Code	Mitigation Measure Title	Status update
EMM4	Consideration of the Broadest Possible Range of Alternatives in all Future Energy Transmission Strategies	Complete and integrated fully into Irelands Grid Strategy and EirGrids approach to developing the Grid.
EMM5	Preparation of Transmission Development Plan Environmental Appraisal Report	Ongoing with each iteration of the TDP
EMM6	Ongoing Co-operation in preparation of Renewable Energy Generation Guidelines and Strategies	Ongoing
EMM7	Integrating Offshore Grid connectivity requirements and environmental considerations in EirGrid's Strategic Environmental Framework (SEF)	Commenced
EMM8 (A to K)	Other measures integrated into the IP	Measures to be adhered to for new projects as relevant and as appropriate. Draft Grid Implementation Plan 2017-2021 builds on foundation set in pervious IP and SEA.

EMM8 Other Measures Integrated into the IP

Mitigation measures described below have been worded to facilitate direct transcription and incorporation into the Implementation Programme.

Note that the following mitigation measures will be extended and augmented by the output from the Environmental Benchmarking Studies and Evidence-Based Design Guidelines described above.

EMM8A Biodiversity and Flora and Fauna

EMM8A(i) Designated European and National Sites of Nature Conservation Interest

Every effort will be made to avoid designated sites of conservation importance. However, where this is not possible, routing will be selected to ensure no significant impacts on the integrity of the site. Restricted working areas will be imposed to ensure minimal disturbance to sensitive habitats.

Sensitive construction techniques will be used such as the use of bog mats for machinery access, particularly if underground cables are proposed or in remote bogland areas. Aerial access will be considered - for both materials and workforce - in exceptionally sensitive sites.

Ecological monitoring will be undertaken at sensitive sites during construction as appropriate. Such sites will be identified on a case by case basis.

EMM8A(ii) General Habitat Loss and Disturbance

- Where possible, direct habitat loss within designated sites will be avoided.
- When construction occurs within a designated site, sensitive construction techniques will be used such as the use of bog mats for machinery access, particularly if underground cables are proposed or in remote bogland areas. Aerial access will be considered - for both materials and workforce - in exceptionally sensitive sites.
- Use of bog-mats to minimise the impact of heavy machinery on vegetation and soils.
- Minimise extent of works areas.
- Re-distribute vegetation and soil stripped from the construction areas to provide a seedbank and do not re-seed with Perennial Ryegrass.
- Land within the working area will be reinstated as near as possible to its former condition.

EMM8A(iii) Bogs and Peatland areas

- Areas of deep and active peat shall be avoided.

- Detailed peat slip risk assessments should be carried out for all proposed developments in areas where peat substrates occur.
- Construction machinery should be restricted to site roads and designated access routes. Machinery should not be allowed to access, park or travel over areas outside development construction zones.
- Peat excavated during construction activity should not be stored (temporarily or otherwise) on areas of adjacent mire habitats or near flushes or drains. Temporary storage of spoil material excavated during the construction phase developments should be stored at suitable locations away from surface watercourses.
- All spoil material excavated during the construction phase should be reinstated following the completion of the construction phase of a proposed development.
- Where disturbance of peat soils cannot be avoided, there should be some consideration given to possible re-seeding with native species to stabilise the peat and accelerate recovery of the vegetation.

EMM8A(iv) Birds

- Where feasible, site clearance involving the cutting or destruction of vegetation and hedgerows shall not take place in the bird breeding season between March 1st and August 31st inclusive.
- On the advice of relevant ornithological experts and agencies bird warning devices shall be put in place where crossings of sensitive flight corridors cannot be avoided.

EMM8A(v) Bats

- The removal of bat commuting and foraging habitat shall be avoided where possible during the construction and operation phase of infrastructure.
- Where the removal of commuting or foraging habitat cannot be avoided alternative habitat should be established prior to such habitat removal.
- Trees scheduled for felling as part of site clearance shall be checked by a bat specialist for the presence of bats.
- Where bats are noted to be within a tree prior to felling operations, it will be necessary to postpone felling to create the opportunity for bats to cease usage. If bats do not leave a tree or building within a reasonable time frame, it may be possible for a bat specialist to seek to

exclude the bats (or otherwise remove them to safety). This shall be carried out by a qualified bat specialist with written permission from the National Parks and Wildlife Service by way of a licence to derogate from the protection afforded bats by Irish and EU law. All licences shall be in place prior to felling procedures as to destroy a roost without a licence is an offence.

EMM8A(vi) Otters

- Destruction of active otter holts shall be avoided
- No works shall be undertaken within 150m of any holts at which breeding females or cubs are present.
- No wheeled or tracked vehicles (of any kind) should be used within 20m of active, but non-breeding, otter holts. Light work, such as digging by hand or scrub clearance should also not take place within 15m of such holts, except under licence.

EMM8A(vii) Other protected species

- The breeding and resting sites of protected species shall be avoided during the appropriate seasons.
- Heavy machinery shall not be used within 30m of an occupied badger sett.
- A derogation licence from the respective Wildlife Acts³ shall be sought – and works shall not be commenced without such consent where it appears that protected flora and fauna species are likely to be unavoidably disturbed.

EMM8A(viii) Protected Surface Water or Riparian Habitats

In all cases where works have the potential to impact on protected surface water or riparian habitats, the Inland Fisheries Ireland document Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites shall be adhered to. Development of transmission infrastructure adjacent to designated fisheries shall be carried out in consultation with Inland Fisheries Ireland to minimise the potential effects on designated surface waters.

³ Referenced statutory obligation

EMM8A(ix) Freshwater Pearl Mussel Catchments

- Action measures as outlined in the Sub Basin Management Plans shall be taken into account where development is considered adjacent to areas associated with Freshwater Pearl Mussels.
- In the vicinity of waters that sustain populations of Freshwater Pearl Mussels the following additional mitigation measures shall be employed;-
 - There shall be no Stream crossing by machinery.
 - Silty water will be collected in settlement ponds prior to discharge to watercourse.
 - Buffering strips will be provided near watercourses.

EMM8A(x) Fisheries

- All works adjacent to designated fisheries waters will be done in consultation with Inland Fisheries Ireland.
- All works involving open cut crossings shall be conducted during the period May to September to avoid interruption of salmonid spawning runs, spawning, incubation of eggs and the early developmental stages.
- Where appropriate and practical, bank vegetation and bed material which has been removed shall be stored to facilitate its replacement when channel works have been completed.
- Works in the vicinity of a watercourse shall be carried out with reference to a water quality protection plan for each site which shall ensure that;-
 - All necessary measures shall be taken to minimise the generation and release of sediments into all watercourses [].
 - Levels of suspended solids in the river shall be monitored during the course of the works.
 - Precautions shall be put in place to avoid spillages of diesel, oil or other polluting substances.

EMM8A(xi) Mature Trees

Where construction work is required close to trees, the National Joint Utilities Group ‘Guidelines for the Planning Installation and Maintenance of Utility Services in Proximity to Trees’ (NJUG 10) will be followed.

EMM8A(xii) Hedgerows

All disturbed hedgerows will be re-planted as soon as possible after construction, using Irish nursery stock and indigenous species. Planting will be maintained until vigorous re-growth has been established. Where hedges of particular value are encountered the extent and duration of the works shall be minimised. For species-rich banks, turf will be stripped and stored separately for replacement on re-instatement.

EMM8B Water Resources

EMM8B(i) Accidental spillage of fuel chemicals or sewage causing pollution to water or ground

- Develop, implement and enforce a Water Pollution Prevention and Environmental Emergency Response Plan for all work sites [See also o]. This should include good site practices as described in the Good Practice Guidance notes proposed by EA/SEPA/EHS.

EMM8B(ii) Suspended solids & sediment deposition

- Precautions shall be put in place to avoid or minimise the generation and release of sediments⁴ into all watercourses.

EMM8B(iii) Physical Damage to watercourses

- Develop, implement and enforce a code of best practice for construction and reinstatement methods to be used for unavoidable construction works in the vicinity of watercourses.

EMM8B(iv) Flooding

- Within known floodplains measures shall be taken to avoid any potential impact of construction or existence of the works on the capacity for floodwater storage.

⁴ Sediments in this instance include all soils including peat.

- Damage to any flood defence embankments shall be immediately repaired to a standard equal to or better than the existing embankments.
- EirGrid shall carefully examine development proposals to ensure consistency with the requirements of The Planning System and Flood Risk Management: Guidelines for Planning Authorities (DEHLG, 2009)⁵.
- EirGrid shall engage with planning authorities at an early stage, utilising arrangements for pre-planning application consultation with regard to any flood risk assessment issues that may arise.
- EirGrid shall carry out a site-specific flood risk assessment, as appropriate, and comply with the terms and conditions of any grant of planning permission with regard to the minimisation of flood risk.

EMM8C Soils and Geology

EMM8C(i) Geological Features

- Site investigations shall be undertaken at intervals and specific locations along the power circuit route. This information shall be used to plan sitework operations to anticipate, avoid or minimise construction impacts arising from disturbance of sub-surface conditions.
- Cut and fill operations should be avoided unless absolutely necessary.
- Route selection and lower tier assessments should consult Geological Survey of Ireland as appropriate in relation to geological heritage sites either recommended for NHA or County Geological Site designation.

EMM8C(ii) Soil

- Height of stockpiles should be limited to less than 3 m and storage time will be minimised.
- Material handling and reinstatement operations should follow good practice to avoid inadequate or over compaction of the materials.

⁵ Referenced statutory obligation

- Route selection and lower tier assessments for peatland areas should consider relevant government guidelines on development in these areas as well as relevant datasets including the Geological Survey of Ireland’s landslide dataset and Teagasc’s subsoils dataset.

EMM8C(iii) Mineral Resources

The power circuit shall be routed to avoid disturbance to existing or planned operations of areas of extraction and licensed mineral reserves.

EMM8C(iv) Contaminated Land

- A ground investigation may be undertaken to survey, analyse and assess the areas where there is a potential for this risk to arise.
- Following this, method statements shall be prepared to deal with any area of contaminated ground.

EMM8C(v) Bedrock

- Route selection and lower tier assessments should consider Geological Survey of Ireland’s bedrock data as appropriate in order to anticipate engineering difficulties.
- Route selection and lower tier assessments should consider Irish National Seabed Survey data and INFOMAR survey data as appropriate to anticipate the nature and depth of stable substrate for offshore projects foundations and connection to onshore grid.

EMM8D Cultural Heritage

- Where the proposed route is in close proximity to archaeological sites the working area shall be kept to a minimum.
- Pre-construction works shall be carried out in those unrecorded areas identified as having archaeological potential.
- There will be full implementation of an Archaeological Plan including, pre-construction works, watching brief and excavation.
- Where previously unrecorded finds are uncovered during construction, adequate archaeological investigation and recording will be carried out before construction works in these areas are continued.

EMM8E Landscape and Visual

Routes shall be selected according to the following criteria;-

- Avoidance of areas designated as being of scenic sensitivity or significance.
- Avoidance of areas that would disproportionately impinge upon sensitive landscape features – such as prominent skyline ridges, shores, river crossings.
- Avoid areas that would disproportionately impinge upon sensitive areas or sites of cultural or historic significance – including monuments, listed and protected structures and their contexts and sites.
- Route selection and lower tier assessments should consider (as appropriate) data from the landscape character assessments contained in the development plans of local authorities.

EMM8F Noise

In relation to noise sensitive receptors, the constraints mapping shall identified areas of high building density and therefore any route corridors selected shall attempt to minimise impacts on built up areas.

EMM8G Liquid Effluent and Spillages

Portable toilets will be provided at the site offices. They will be emptied regularly by a specialist contractor as appropriate.

EMM8H Solid Wastes

Waste Management Plans will be prepared as part of the overall project design. This will identify likely waste arisings, approximate quantities and appropriate handling and disposal methods.

EMM8I Construction of New Substations and Extension of Existing Substations

EMM8I(i) The construction of new substations can have a significant impact particularly where the area is undeveloped. Site selection needs to ensure sensitive landscapes and habitats are avoided. Opportunities for natural screening from topography and vegetation should be maximised and used wherever possible as this will provide the best opportunity for integrating the facility into the existing landscape.

EMM8I(ii) It will be important to ensure that substations are not located within the floodplain of major watercourses, which could impact on the access and functioning of the substation. Also, it will also be important to ensure that new substation locations avoid designated conservation sites and sensitive habitats.

EMM8I(iii) Where existing substations need to be extended it will be important to ensure the extension does not impact on any nearby built up areas and that the extension is appropriately designed to ensure adequate integration with the existing environment. The scale of the extension should be suited to the surrounding area and should not be inappropriate given the size of the existing facility and its surroundings.

EMM8J Reinforcement of the Transmission System in the Regions⁶

EMM8J(i) Midlands Region

The Midlands Region is transected by many kilometres of major and minor grid infrastructure as well as having a significant concentration of junctions and substations - many associated with existing or former power stations. These routes and sites offer strong precedent that should be re-used wherever possible. It should be recognised that large areas of cut-over peat lands may not be suitable low-resistance routing options as many of these sites are nearing the end of production and most if not all will shortly be reinstated as peat land sites that are likely to be deemed to be sensitive - if not protected - habitats.

New major grid projects in this Region will be challenged when trying to identify optimum crossing points over the sensitive Shannon system. Existing crossing points should be re-used or intensified wherever possible. Such crossing points should be identified and secured in regional and county development plans as a matter of urgency - they are nationally significant economic assets.

EMM8J(ii) South-East Region

Larger scale grid developments in the South East Region should parallel coastal plains and major river systems - ideally occupying the transitional foothills - without encroaching on either the more sensitive uplands or the immediate environs of rivers and coasts.

⁶ Note that no specific measures are stated here for the Border and West Regions; all other mitigation measures apply as relevant.

Most major routes within this region follow the transition between uplands and lowlands and cause little adverse environmental effect. If future development continues this general pattern there is a low potential for significant effects to arise.

EMM8J(iii) Mid-West Region

Major grid development works in the Mid-West Region should re-use or closely follow established routings or areas with established precedent of large-scale infrastructural and industrial development. New works should parallel the coasts and rivers - which contain dense corridors of anciently established settlement - while avoiding more sensitive upland interiors. High levels of rural dwellings in some areas may require sub-optimal proximity to some environmental sensitivities, such as cultural heritage.

EMM8J(iv) South-West Region

If new grid development continues patterns of following the strongly east-west trending river valleys in the South-West Region there is a low potential for significant adverse effects on the environment. Major grid developments should be confined to the more environmentally robust centre and east of this region.

The development of new transmission lines between Moneypoint and Cork City would need to carefully consider ecological and visual impact issues, especially in upland areas. Alternatives should consider the reuse of existing power and transport links.

EMM8J(v) Dublin & Mid-East Region

It would be useful to integrate with Development plans - both at Regional and County level - to identify infrastructure corridors - ideally paralleling the existing and emerging major road and rail corridors that will develop in the Dublin and Mid-East Region during the period to 2025. It would also be of merit, for working in existing and emerging urban and peri-urban areas, to clearly identify criteria that would lead to determining when and where to underground electricity infrastructure. Land Use Plans for Urban Areas should be encouraged to specifically zone land for sub-stations and to protect existing strategic corridors from inappropriate development.

Urban areas should be encouraged to specifically zone land for sub-stations and to protect existing strategic corridors from inappropriate development.

EMM8K National and EU Legislation and Plans/Programmes

Where grid related development is proposed, EirGrid will seek to contribute towards the protection of environmental features, as relevant and appropriate to EirGrid's responsibilities and obligations under national and EU environmental legislation and including those which relates to specific regional/national plans/programmes for particular aspects of the environment e.g. Catchment Flood Risk Assessment and Management Study Plans, River Basin District Management Plans and Fresh Water Pearl Mussel Sub Basin Management Plans⁷.

⁷ Referenced statutory obligation