Transmission Development Plan 2024

EirGrid

EirGrid.ie

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*Information in this document with reference to completion dates (Estimated Completion Dates, Forecast Completion Dates and Indicative Completion Dates) has been prepared with all reasonable care and diligence. All and any dates have been estimated and are indicative and subject to change. All dates have been estimated in line with the European Union (Internal Market in electricity) (3) Regulations 2022 (S.I. no 227/2022) and all and any dates are subject to revision.

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Document structure

The structure of the document is as follows:

The **Abbreviations and Terms** provides a glossary of terms and acronyms used in the document.

The **Executive Summary** gives an overview of the main highlights of the document and presents a summary of the plan.

Chapter 1: Introduction – our statutory and legal obligations are introduced. The purpose and context of the Transmission Development Plan (TDP) is outlined.

Chapter 2: Investment drivers – the drivers of network development are introduced and discussed. These drivers are obtained from the nature of the projects which are identified through the application of the grid development approach discussed in Appendix B.

Chapter 3: Changes to the Plan since 2023 provides information on the changes to the plan between TDP 2023 and TDP 2024.

Chapter 4: Planned network developments summarises the development projects that are active.

Chapter 5: Regional view summarises and categorises the development projects that are currently active by region.

Chapter 6: Projects in early stages of development outlines projects in early stages of development.

Chapter 7: Summary of Environmental Appraisal Report (EAR) summarises the EAR of TDP 2024.

Appendix A: Irish projects in European Plans.

Appendix B: EirGrid's approach to grid development.

Appendix C: Summary of projects.

Appendix D: References.

Online interactive mapping for the projects contained in the TDP has been included at the following link.

Abbreviations and terms

Abbreviations

AA	Appropriate Assessment
ABP	An Bord Pleanála
AIS	Air Insulated Switchgear
CP No.	Capital Project Identification Number
CPP	Committed Project Parameters
CRU	Commission for Regulation of Utilities
DSO	Distribution System Operator
EAR	Environmental Appraisal Report
EC	European Commission
ECD	Estimated Completion Date
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
ENTSO-E	European Network of Transmission System Operators for Electricity
ER	Environmental Report
ESB	Electricity Supply Board
EU	European Union
EWIC	East West Interconnector
GCS	Generation Capacity Statement
GIS	Gas Insulated Switchgear
GW	Gigawatt
HV	High Voltage
HVDC	High Voltage Direct Current
IA	Infrastructure Agreement
IP	Implementation Programme
LCA	Line Condition Assessment
LPA	Local Planning Authority
LPAR	Line Project Assessment Report
MEC	Maximum Export Capacity
MIC	Maximum Import Capacity
MW	Megawatt
NDP	Network Delivery Portfolio
NIS	Natura Impact Statement
OHL	Over Head Line
PA	Project Agreement
PV	Photo Voltaic
RegIP	Regional Investment Plan
RES	Renewable Energy Sources
RES-E	Renewable Energy Sources – Electricity
RESS	Renewable Electricity Support Scheme
RGNS	Regional Group North Sea
RIDP	Renewable Integration Development Project
SAC	Special Area of Conservation
SEA	Strategic Environmental Assessment
SEM	Single Electricity Market
SI60	Statutory Instrument No. 60 of 2005
SI147	Statutory Instrument No. 147 of 2011
SI445	Statutory Instrument No. 445 of 2000
SI227	Statutory Instrument No. 227 of 2022
SOEF	Shaping Our Electricity Future
SONI	System Operator Northern Ireland
SPA	Special Protection Areas
SNSP	System Non-Synchronous Penetration
TAO	Transmission Asset Owner
TDP	Transmission Development Plan
TES	Tomorrow's Energy Scenarios
TESNA	Tomorrow's Energy Scenarios Needs Assessment
TSO	Transmission System Operator
TSSPS	Transmission System Security and Planning Standards
TYNDP	Ten Year Network Development Plan
TYTFS	Ten Year Transmission Forecast Statement
UGC	Under Ground Cable

Terms

Active power
Active power is the power which is consumed or utilised in an AC Circuit. It is also called average, true, or real power. It is measured in megawatt (MW).

Air Insulated Switchgear (AIS)
This is a type of electrical substation equipment that uses air as the primary insulating medium.

Bay
A connection point to a busbar and comprising switchgear and measurement equipment.

Busbar
An electrical conductor located in a station that makes a common connection between several circuits.

Capacitor
An item of plant normally used on the electrical network to supply reactive power to loads (generally locally) and thereby support the local area voltage.

Capital Project Number (CP No.)
Each project has a unique Capital Project Number to help coordination between EirGrid and the TAO and for reporting purposes.

Circuit
A line or cable, including associated switchgear, which carries electrical power.

Circuit breaker
A device used to open a circuit that is carrying electrical current.

Constraint
A change in the output of generators, scheduled in the market or not, due to transmission network limitations – specifically the overloading of transmission lines, cables and transformers.

Contingency
An unexpected failure or outage of a network component, such as a generation unit, transmission line, transformer, or another electrical element.

Coupler
This is a device which can be used to either connect or disconnect sections of busbars. A coupler increases security of supply and flexibility under both fault and maintenance conditions. A coupler can also be known as a sectionalising circuit breaker.

Deep Reinforcement
Refers to network reinforcement additional to the shallow connection that is required to allow a new generator or demand to operate at maximum export or import capacity respectively.

Demand
The amount of electrical power that is consumed by a customer and is measured in Megawatts (MW). In a general sense, the amount of power that must be transported from transmission network connected generation stations to meet all customers' electricity requirements.

Demand-Side Management
The modification of normal demand patterns usually using financial incentives.

Deterministic Methodology
The deterministic methodology is often referred to as the N-1 criterion. This means that the system must have sufficient capacity so that in the eventuality of a system outage, there are no resulting system problems such as overloading, under-voltage, over-voltage, or instability.

Distribution System Operator (DSO)
In the electrical power business, a distribution system operator is the licensed entity responsible for:

- Operating and ensuring the maintenance and development of the distribution system in each area (and its interconnections), if necessary and where applicable; and
- Ensuring the long-term ability of the system to meet reasonable demands for electrical power.

EirGrid
The independent statutory electricity Transmission System Operator in Ireland.

Embedded Generation
Refers to generation that is connected to the distribution network or at a customer's site.

Estimated Completion Date (ECD)
The estimated completion or forecast energisation date of a project. The estimate is subject to the:

- Planning process where applicable.
- Construction progress.
- Availability of transmission outages and commissioning.

*ECDs are indicative dates and subject to change.

Gas Insulated Switchgear (GIS)
A compact form of switchgear where the conductors and circuit breakers are insulated by an inert gas (that is, typically SF_6).

Gate
A group processing mechanism to efficiently process large volumes of connection applications from renewable and conventional generators wishing to connect to the transmission or distribution systems. This is a CRU approved and directed approach.

Generation Dispatch
The configuration of outputs from the connected generation units.

Grid
A network of high voltage lines and cables (400 kV, 275 kV, 220 kV and 110 kV) used to transmit bulk electricity supplies around Ireland. The terms grid, electricity transmission network and transmission system are used interchangeably in this Development Plan.

Intact Network
The transmission network with no network element removed for maintenance, replacement, or repair.

Interconnector
The electrical link, facilities and equipment that connect the transmission network of one jurisdiction to another.

Maintenance Trip Conditions
This condition occurs when a network component (generation unit, transmission line, transformer, or other electrical element) is out of service for maintenance and there is an unexpected failure or outage of another network component.

Maximum Export Capacity (MEC)
The maximum export value (MW) provided in accordance with a generator's connection agreement. The MEC is a contract value which the generator chooses as its maximum output.

Maximum Import Capacity (MIC)
The maximum import value (MW) provided in accordance with a customer's connection agreement. The MIC is a contract value which a customer chooses to cater for maximum demand at their site.

Network Development Driver
A factor based on national and European energy policy objectives that influences or 'drives' the investment in the transmission network.

Network Development Need
A deficiency or problem on the network which arises because of one or several network development drivers. Network reinforcement is required to solve a network development need.

Power Flow
The physical flow of electrical power. It is typically measured in Mega Volt-Amperes (MVA) which is the complex combination of both 'active' and 'reactive' electrical power. The flow of 'active' power is measured in Megawatts (MW); the flow of 'reactive power' is measured in Mega Volt-Amps-Reactive (MVAr).

Phase Shifting Transformer (PST)
A type of device employed on the electrical network to control the flow of active power.

Reactive Compensation
The process of supplying reactive power to the network to compensate for reactive power usage at a point in time.

Reactive Power
The portion of electricity that establishes and sustains the electric and magnetic fields of alternating current equipment. Reactive power is measured in Mega Volt-Amps-Reactive (MVAr).

Reactor
An item within a power plant comprising a coil of electrical wire. It is typically employed on the electrical network to either:

- Limit short circuit levels; or
- Prevent voltage rise,

depending on its installation and configuration.

Series compensation
A technology that boosts flows on very long transmission lines. There have been recent advances in this technology and its control systems. This allows for greater flexibility and more benefits when using series compensation.

Shallow connection
The local connection assets required to connect a customer, or customers, to the transmission network. These types of connections are typically for the specific benefit of that customer or group of customers.

Single contingency conditions
This condition occurs when the transmission network is intact and there is an unexpected failure or outage of one network component (generation unit, transmission line, transformer, or another electrical element).

Substation
A substation is a part of an electrical generation, transmission and distribution system. Substations transform voltage from high to low, or the reverse, or perform any of several other important functions.

Summer Valley
The annual minimum electrical demand that usually occurs in August.

Summer Peak
The week-day peak electrical demand value between March and September, inclusive, which is typically 80 % of the winter peak.

Switchgear
A combination of electrical equipment such as disconnects and/or circuit breakers used to isolate equipment in or near an electrical station.

Teleprotection
Teleprotection is the use of communications for power system protection applications.

Transformer
An item of electrical equipment that allows electrical power to flow between typically two different voltage levels in an alternating current (AC) power system.

Transmission Losses
A small proportion of energy is lost in the form of heat or light whilst transporting electricity on the transmission network. These losses are known as transmission losses.

Transmission Peak
The peak demand that is transported on the transmission network. The transmission peak includes an estimate of transmission losses.

Transmission System Security and Planning Standards

The set of standards that the transmission system is designed to meet. The criteria are deterministic as is the norm throughout the world. They set out objective standards which have been found to deliver an acceptable compromise between the cost of development and the transmission service provided. The Transmission System Security and Planning Standards were previously referred to as the Transmission Planning Criteria.

Transmission System Operator (TSO)

In the electrical power business, a transmission system operator is the licensed entity that is responsible for:

- Operating and ensuring the maintenance and development of the transmission system in each area (and its interconnections), if necessary and where applicable; and
- Ensuring the long term ability of the system to transmit electrical power from generation plants to transmission connected demand and regional or local electricity distribution operators.

Uprate

To increase the capacity or rating of electrical equipment. It can include works such as upgrades and/or repairs.

Winter peak

This is the maximum annual system demand. It occurs in the period October to February of the following year, inclusive. Thus, for transmission planning purposes the winter peak 2023 – 2024, the first year of this Plan, may occur in late 2023 or early 2024. The winter peak figures consider the impact of projected Demand-Side Management initiatives.

Contents

Executive summary

As the global community intensifies efforts to combat climate change, the imperative to transition towards low-carbon energy sources becomes increasingly urgent.

Transmission infrastructure plays a pivotal role in facilitating this transition by enabling the integration of renewable energy sources and enhancing grid reliability.

The development of the Irish electricity sector is guided by several national and European Union (EU) policy and strategic objectives. These objectives guide investment in the Irish transmission network and the drivers for these are summarised as follows:

- Ensuring the security of electricity supply with respect to transmission infrastructure.
- Ensuring the competitiveness of the national economy by supporting market integration.
- Establishing long-term sustainability of electricity supply in the country by supporting the integration of renewable energy sources, development of interconnectors, thermal generation and system services providers.
- Guaranteeing grid resilience and reliability by the timely management of transmission assets to ensure safe, secure and efficient operation.

The Transmission Development Plan (TDP) is a statutory document which details the grid development projects that are being undertaken by EirGrid to achieve the objectives.

Transmission Network Development Framework

The TDP reports the planned transmission infrastructure projects that need to be built or upgraded over the ten years from 2024 to 2033. The timeline of the TDP aligns with the strategic planning horizons adopted by EirGrid. These are the medium-term planning, long-term scenario planning and strategic visions for the future. The medium-term planning looks at demand and generation forecasts and opportunities as well as accompanying network reinforcements to meet these forecasts within the next ten years. This medium-term planning includes the Generation Capacity Statement (GCS)[1] which contains ten-year demand forecasts and generation portfolio for generation adequacy and the Six Step Grid Delivery process. Furthermore, in the medium-term, the All-Island Ten-Year Transmission Forecast Statement (TYTFS)[2] sets out the state of the transmission system and a ten-year assessment of the opportunities for new demand and generation connections.

With a longer-term perspective, long-term scenario planning considers various scenarios and/or pathways to achieve the energy transition from current period until 2050. This planning also assesses the long-term needs of the transmission system in terms of future resiliency and robustness. Firstly, a range of credible pathways for Ireland and Northern Ireland's energy system transition is set out by Tomorrow's Energy Scenarios (TES).

1 EirGrid is required to publish forecast information about the power system, as set out in Section 38 of the Electricity Regulation Act 1999 and Part 10 of S.I. No 60 of 2005 European Communities Regulation.
2 EirGrid is required to publish a forecast statement in line with Condition 7 of the Transmission System Operator licence and as set out in Section 38 of the Electricity Regulation Act 1999.

Subsequently, an assessment of the long-term needs of the transmission system is presented in Tomorrow's Energy Scenarios System Needs Assessment (TESSNA). To meet the needs identified in TESSNA, a strategic vision is developed leading to a roadmap for implementation.

In 2021, EirGrid published Shaping Our Electricity Future roadmap which was the culmination of the TES cycle commenced in 2019. Shaping Our Electricity Future v1.1, which launched in June 2023, was an update to the roadmap to accommodate changes in government targets for renewable electricity in 2030. These national goals are captured in the government's Climate Action Plan (CAP) in terms of the decarbonisation target and net-zero operation.

In December 2023, EirGrid consulted on TES23, the next iteration of the scenario planning cycle. TES23 describes a range of credible pathways for Ireland and Northern Ireland's energy system transition for 2035, 2040 and 2050. In 2024 EirGrid will finalise the scenarios when the consultation is completed and then will begin the work to develop the next strategic vision for the transmission system in 2040 and the roadmap for implementation of the vision. The vision and roadmap for 2040 will include both offshore and onshore network development plans to accommodate the offshore wind generation targets covered in TES23, which are aligned with government ambitions.

These strategic plans are taken in conjunction with the European long-term plans (European Resource Adequacy Assessment and ENTSO-E Ten-Year Network Development Plan) to form the transmission development plan. All these studies and reports jointly identify the investment needs required across the country to meet the climate targets, deliver a resilient and robust grid and support net-zero operation. The TDP synthesizes this wide range of information and reports the identified infrastructure needs as new projects, upgrades and reinforcements to be carried out within the next ten years. In this TDP, most of the projects reported are in one of the stages of EirGrid's six-step grid development process. These include those in the early stages of development as well as those that have received capital approval, project approval and those waiting to be energised. A few of the projects reported are network assessments for the future and thus, only a broad overview of these is presented.

Summary of the projects in the TDP

This TDP reports several infrastructure improvement projects underway in the country. These include refurbishment projects, uprates (enhancing the electrical capacity of a cable or line) and modification of transmission lines and cables as well as construction of new substations and connection of new generation assets across the network. Summarily, the committed projects reported in this version of the TDP include over six-hundred and fifty kilometres (650 km) of line and cable refurbishments/ replacements due to old age or maintenance challenges to ensure grid resiliency and reliability. Furthermore, more than a thousand kilometres (1000 km) of lines and cables will be uprated to enable greater power carrying capacity. In terms of onshore and offshore generation assets, approximately nine thousand megawatts (9,000 MW) of new generation capacity is expected to be connected over the next ten-years. This number excludes the interconnectors that are scheduled to be connected during this timeline.

A number of the uprates to the 110 kV grid will be taking place in the West and Midland regions. The uprates in the West of the island are due to the need to transport power from existing renewable generation in the area to the midlands and the east of the island. Upgrades in the counties near Dublin, Kildare and Meath, are to cater to increases in the power flow to the Dublin region from new renewable energy developments under construction in the Midlands. The upgrades in the South and Southwest, specifically in Cork, will support the expected increases in power flow from this region's interconnection with France.

The 220 kV network in the West and Midlands is being refurbished to enhance the conditions of the asset and cope with the forecast increase of the power flow in these regions. The main uprate in the 220 kV network is taking place in the Northeast, aiming to contribute to increasing the capacity of the network.

Almost the entire 400 kV corridor from Moneypoint to Dublin is being refurbished. The construction of major new 400 kV infrastructure will connect Ireland and Northern Ireland and connect Woodland and Dunstown stations improving supply in the east region. Figure 1 shows the planned refurbishments, uprates and new assets across the transmission network across the different voltage levels.

Following assessment recommendations based on the state of the assets, a number of refurbishments driven by asset end of life are planned in several 110 kV stations, principally in the South. The future renewable energy connections in the Midlands and counties near Dublin are reflected in the number of new substations being planned in these areas. These new substations and the existing ones are shown in Figure 2.

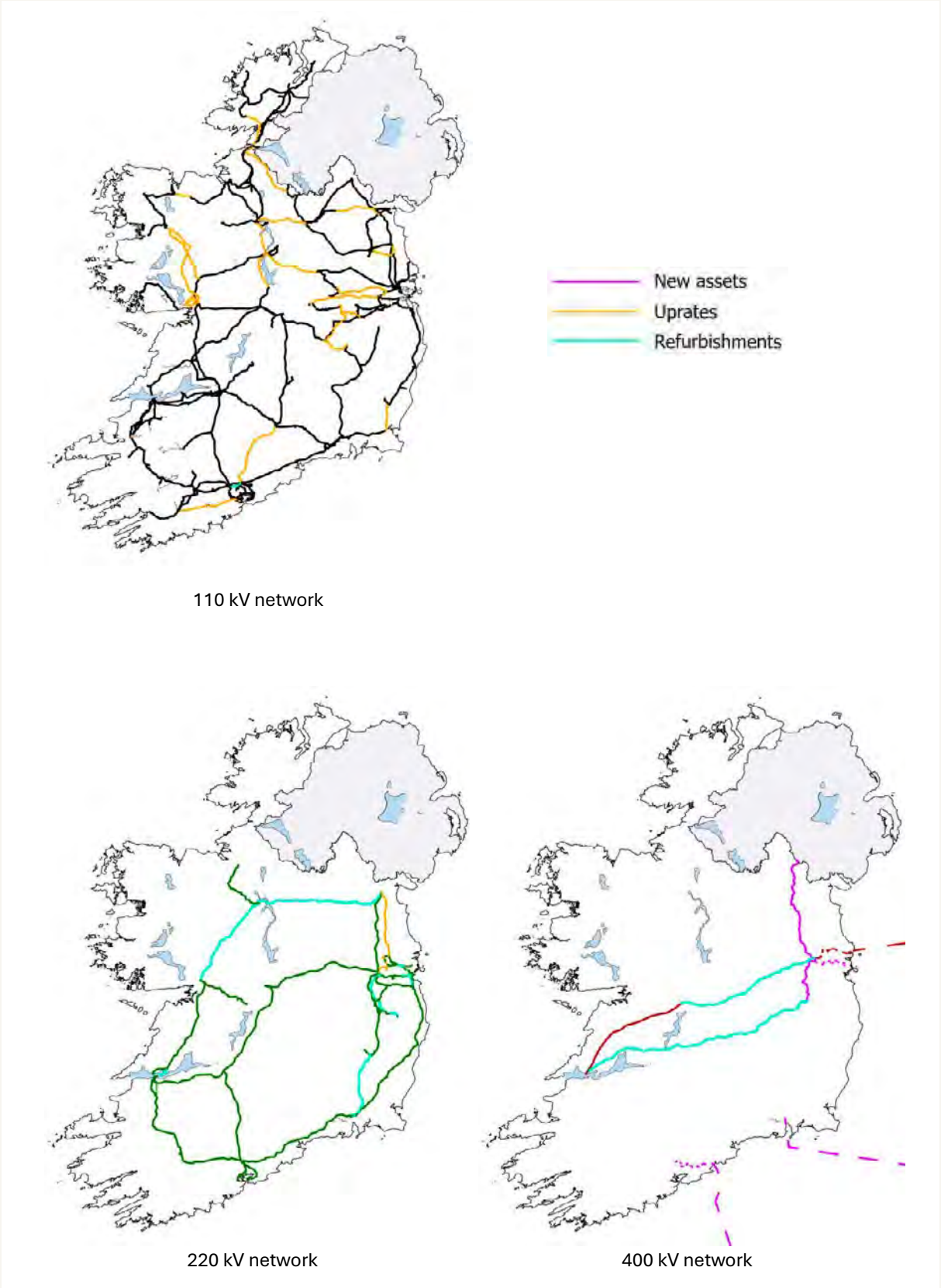


Fig 1: Transmission line uprates, refurbishments and new assets across the different voltage levels

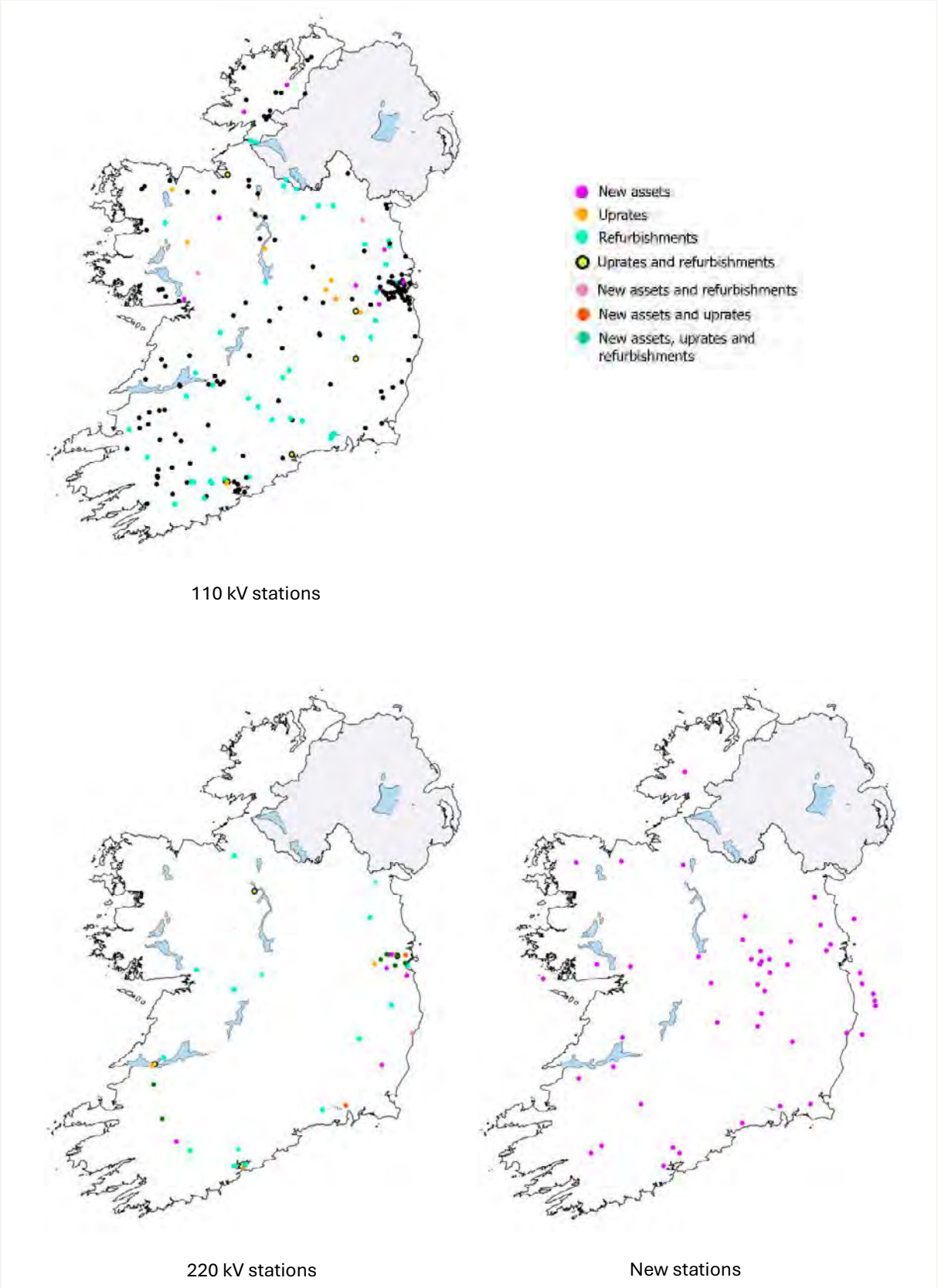


Fig 2: Existing transmission substations in Ireland and new substations being built

Key objectives of the TDP

Integration of Renewable Energy

The plan prioritises the expansion and enhancement of transmission networks to accommodate the growing capacity of renewable energy sources such as wind (onshore and offshore) and solar power. By facilitating the integration of these clean energy sources into the grid, the projects reported in the TDP aims to show how we are working towards reducing reliance on fossil fuels and decreasing greenhouse gas emissions as we work towards net zero emissions by 2050.

Grid Resilience, and Reliability

Recognising the vulnerability of energy infrastructure to extreme weather events exacerbated by climate change, the TDP emphasises investments in grid resilience and reliability, hence ensuring security of supply. This involves upgrading existing transmission infrastructure to withstand changing climate, optimised asset maintenance and implementing advanced technologies for real-time monitoring and predictive maintenance.

Policy and Regulatory Alignment

The TDP aligns with existing climate policies and regulatory frameworks at national and European levels. By adhering to established environmental standards and compliance requirements, the plan ensures regulatory certainty and fosters investor confidence in transmission infrastructure development.

In summary, the Transmission Development Plan 2024 – 2033 sets out EirGrid's approach to addressing the challenges of climate change and emissions reduction within the realm of electricity transmission infrastructure, in line with the licence and legislative requirements. By prioritising the integration of renewable energy, enhancing grid resilience and aligning with policy frameworks, the plan lays the foundation for a sustainable and resilient energy future.

1. Introduction

EirGrid develops, manages and operates Ireland's electricity grid. The grid supplies the electricity that is brought to homes, businesses, schools, hospitals and farms across the country. Ireland needs more electricity to meet the growing demands of our country. We also need our electricity to be cleaner. This means moving away from fossil fuels and instead using renewable sources of energy such as wind and solar.

To make this transition, EirGrid has a unique role to play in transforming the power system, making the grid stronger and more flexible. The work we do now will help create a more sustainable future for generations to come.

The primary objective of the Transmission Development Plan (TDP) is to describe the transmission network reinforcements planned for the next ten years so that we can achieve the objectives outlined above and become more renewable ready.

The TDP outlines:

- The drivers of network development.
- The network investment needs.
- The planned network developments required to address these needs.

This TDP covers Ireland. SONI, the electricity Transmission System Operator for Northern Ireland, produces the TDP for Northern Ireland[3].

1.1 Statutory and licence requirements

EirGrid is responsible for the operation and development of the transmission network in Ireland. We have both statutory and licence obligations to produce a TDP, these are:

- Regulation 8(6) of Statutory Instrument (SI) No. 445 of 2000[4] as amended.
- Regulation 8(6) of Statutory Instrument (SI) No. 227 of 2022[5] as amended.
- Condition 8 of EirGrid's Transmission System Operator (TSO) Licence; and
- Article 51 of Directive 2019/944/EC.

3 https://www.soni.ltd.uk/media/documents/SONI-Transmission-Development-Plan-Northern-Ireland-2020-2029.pdf
4 https://www.irishstatutebook.ie/eli/2000/si/445/made/en/print#article8
5 https://www.irishstatutebook.ie/eli/2022/si/227/made/en/print

1.2 Transmission Development Plan 2024

TDP 2024 is our plan to develop the network through specific projects over the next ten years. It is possible that changes will occur in the scope and timing of the listed developments. Similarly, given the continuously changing nature of electricity requirements, new developments will emerge. These changes will be accommodated in future TDPs. As such, the long-term development of the network is constantly under review.

To help the comparison of network development projects year-on-year and in the interest of routine reporting, data is represented at a fixed point in time – the data freeze date. The freeze date for project inclusion for this TDP is 31st January 2024 to align with the project data contained in the Q4-2023 Network Delivery Portfolio (NDP) which is published on EirGrid's website. The previous TDP (TDP 2023) had a freeze date of 21st December 2022.

In this TDP, we report on projects according to our six-step process for developing the grid and engaging with stakeholders. The six-step process is set out in Appendix B, in our Have Your Say brochure. EirGrid's annual stakeholder engagement activities and plans, including project consultations and engagements, are detailed on our website.

Figure 1-1: Our framework for grid development

This TDP describes all committed projects that are in steps 4 to 6 of our six-step process on the freeze date of 31st January 2024. Committed projects are those that have received EirGrid capital approval which occurs at the end of step 3 (i.e., Gateway 3 (GW3) approval as described in Appendix B). Indicative completion dates are included for these projects as detailed in Chapter 5. This TDP also includes information in Chapter 6 on projects that are in the early stages of development, i.e., in steps 2 and 3 of the grid development framework. As these projects progress and get EirGrid capital approval, they will move through steps 4 to 6. As of the data freeze date, projects beyond 2030 are in the early stages of planning and energisation dates are not available at this time. These energisation dates will be reported in future NDP and TDP as projects progress through the Grid Development Framework.

EirGrid is required to publish quarterly updates on the progress of all its transmission infrastructure projects as set out in CRU/20/154[6], the CRU's PR5 Regulatory Framework, Incentives and Reporting Decision Paper. The update(s) are intended to provide customers, industry participants and other interested parties with a clear, accessible, comprehensive, quantified but non-technical report on performance in the previous calendar year.

EirGrid is focused on completing the reinforcements which give the most benefit and have the highest degree of deliverability. Customer connection programmes are subject to change and we are focused on delivering all connections which support economic and social development while meeting government targets.

Since October 2022, our Network Delivery Portfolio (NDP)[7] quarterly status reports, which serves as an input to the TDP, has been published on our website. All outage information is published on EirGrid's website. In addition, EirGrid and ESB Networks, in their respective capacity as TSO and TAO, publish an Annual Electricity Transmission Performance Report (APR) and an Investment Planning and Delivery Report (IPD)[8].

Regarding cybersecurity, EirGrid is required as part of PR5 to provide an annual report on its cyber security measures to the CRU, which includes an independent third-party assessment of EirGrid's security posture and maturity.

6 https://www.cru.ie/regulations-policy/energy/planning-and-development/
7 https://www.eirgrid.ie/grid/grid-reports-and-planning/network-delivery-portfolio
8 https://www.eirgrid.ie/industry/tso-regulatory-publications

1.3 Process for developing the TDP

This TDP covers a period of ten years. As part of the preparation of the TDP, a public consultation on the draft TDP is held by CRU. Following the public consultation, EirGrid provides a consultation report to CRU on feedback received, the draft TDP is updated as required and the final version of the TDP is prepared and submitted to CRU for approval.

1.4 Context of the plan

The Transmission Development Plan is prepared following Statutory and License obligations. These are the Regulation 8(6) of the Statutory Instrument 227 0f 2022, amendment of Statutory Instrument 445 of 2000, Condition 8 of EirGrid's Transmission System Operator (TSO) Licence and Article 51 of Directive 2019/944/EC.

The development of the transmission network involves forecasting future needs. Solutions to address these needs must strike a balance between network reliability, costs and environmental impacts. The process is flexible to enable the long-term development of the network. Considerations that shape the medium and long-term development, as well as strategic visions for the transmission network are outlined below. It is important that readers of this TDP are aware of the all-island and European context. Readers should consider these other documents, our approach to scenario planning, detailed in the next section and Shaping Our Electricity Future Roadmap.

Users or potential users of the transmission system may also find it beneficial to consult specific sections in the All-Island Ten-Year Transmission Forecast Statement (TYTFS). The specific sections 'How to Use the Information for Generation' and 'How to Use the Information for Demand' are in Sections 7 and 8 of the TYTFS respectively. The sections outline how generation and demand customers can use the 'opportunities to connect' information in the TYTFS.

In Figure 1-2, an overview of the various planning documents and their links is shown. The medium-term plans link to the long-term plans and then to the strategic vision for grid development. This in turn serves as input to the medium-term plans to complete the planning cycle. This, by extension also feeds the European plans.

The All-Island Generation Capacity Statement (GCS), All-Island Ten-Year Transmission forecast Statement (TYTFS), Transmission Development Plan (TDP), European Resource Adequacy Assessment, ENTSO-E Ten-Year Network Development Plan (TYNDP) and TYNDP Scenarios Report are statutory documents.

Tomorrow's Energy Scenarios (TES), Tomorrow's Energy Scenarios System Needs Assessment (TESSNA) and Vision and Roadmap are strategic long-term plans utilized by EirGrid to meet its goals.

Further explanations on the different documents are outlined in the following subsections.

Statutory documents

All-Island Generation Capacity Statement (GCS)

Contains ten-year demand forecasts and generation portfolio for generation adequacy.

All-Island Ten-Year Transmission Forecast Statement (TYTFS)

The state of the transmission system and a ten-year assessment of the opportunities for new demand and generation connections.

Transmission Development Plan (TDP)

Development plans for the transmission network to be progressed over the next ten years.

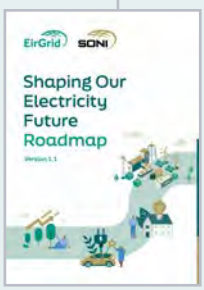
Strategic long-term plans

Tomorrow's Energy Scenarios (TES)

A range of credible pathways for Ireland and Northern Ireland's energy transition from today until 2050.

Tomorrow's Energy Scenarios System Needs Assessment (TESSNA)

Assessment of the long-term needs of the transmission system.



Vision and Roadmap (Shaping Our Electricity Future)

Strategic whole of system assessment of a single scenario to deliver government decarbonisation targets and support net zero operation.

Figure 1-2: Transmission planning framework

European long-term plans

European Resource Adequacy Assessment

Pan-European monitoring assessment of power system resource adequacy of up to 10 years ahead.

ENTSO-E Ten Year Network Development Plan + (TYNDP)Offshore Network Development Plan (ONDP)

Assessment of pan-European projects including Projects of Common Interest (PCI).

ENTSO-E Ten Year Network Development Plan – Scenarios Report

Pan-European energy scenarios, used in TYNDP, provides guidance for TES scenario development.

Medium term planning

10 years

Long term scenario planning

35 years

Strategic visions

50 years

1.4.1 All-Island and European context

Our TSO licence obliges us to carry out transmission planning on a coordinated all-island basis with SONI. This requirement is set by the System Operator Agreement in place between EirGrid and SONI. Each year EirGrid and SONI jointly prepare the All-Island Generation Capacity Statement (GCS)[9]. The GCS is an annual document that outlines demand forecasts and assesses the generation adequacy of the island of Ireland over a ten-year period.

EirGrid and SONI also jointly prepare the annual All-Island Ten-Year Transmission Forecast Statement (TYTFS)[10]. The TYTFS provides detailed data and models of the transmission system. The TYTFS is designed to assist users and potential users of the transmission system to identify opportunities to connect to and make use of the transmission system. The demand forecast in the TYTFS is based on the demand forecast in the GCS.

SONI publishes the Transmission Development Plan for Northern Ireland. The TDPs for Ireland and Northern Ireland provide details of the transmission system developments expected to be progressed in Ireland and Northern Ireland in the coming 10 years[11]. These transmission system developments are also included in the data, assumptions and analyses in the TYTFS.

European legislation requires all European TSOs to cooperate through the European Network of Transmission System Operators for Electricity (ENTSO-E). ENTSO-E has six regional groups that co-ordinate network planning and development at regional level. We are members of the Regional Group North Sea (RGNS). ENTSO-E publishes a Ten-Year Network Development Plan (TYNDP) every two years which outlines projects of European significance. Through 2023, EirGrid worked with ENTSO-E and other European TSOs to produce the first Offshore Network Development Plan (ONDP) that ENTSO-E published in January 2024. The ONDP illustrates how a pan-European offshore electricity grid could look in 2040 and 2050 to meet EU member state offshore renewable energy ambitions. For Ireland, the ONDP includes the build-out of over 6GW of offshore transmission infrastructure towards the UK and Continental Europe.

EirGrid is also actively participating with other TSOs under the Ostend Declaration agreed on 24th April 2023 by 9 North Seas countries, including Ireland, with the aim of developing cross-border policy relating to hybrid and multi-purpose projects and to identify and develop network options for a North Seas Grid Map (including the Irish & Celtic Seas). This work includes policy development in relation to cross-border cost-sharing, markets (including offshore bidding zones) and supply chain capability. The Grid Map will be further developed through 2024 and will explore the establishment of further hybrid interconnector projects from Ireland towards the UK and Continental Europe. Irish projects in European plans are detailed in Appendix A.

9 https://cms.eirgrid.ie/sites/default/files/publications/19035-EirGrid-Generation-Capacity-Statement-Combined-2023-V5-Jan-2024.pdf
10 https://cms.eirgrid.ie/sites/default/files/publications/All%20Island%20Ten%20Year%20Transmission%20Statement-2022.pdf
11 The TDP is prepared with consultation with the System Operator of Northern Ireland to ensure a consistent basis for projects.

1.4.2 Tomorrow's Energy Scenarios

Scenario Planning was introduced into our grid development process in 2017 to help ensure we can meet the future needs of society with regards to electricity, as well as outline Ireland's pathway to a clean energy transition. We call our scenario planning Tomorrow's Energy Scenarios[12] (TES) which looks out to 2035, 2040 and 2050. Our scenarios detail a range of potential futures for the electricity sector in Ireland, with specific focus on what this means for the electricity transmission system over the next twenty years and beyond. The underlying assumptions in the scenarios are validated using feedback received from stakeholders such as policy makers, industry and the public as part of an open consultation. This includes feedback from Gas Networks Ireland on projections for gas usage for electricity generation in Ireland. When the scenarios are finalised, we use them to test the performance of the electricity transmission grid and publish the results in the TES System Needs Assessment (SNA)[13]. From the TES SNA a strategic vision and roadmap for implementation is developed, with Shaping Our Electricity Future being the most recent example of this. The roadmap contains candidate network solutions which require further detailed analysis in our six-step process for developing the grid.

Additional projects will be included in future TDPs as the needs identified in the TES SNA, and candidate solutions proposed in the roadmap, are brought through our six-step process for developing the grid. Inherent in this is the requirement to achieve 80% RES-E target by 2030. The need and requirement for transmission capacity is continuously evolving. In addition to the needs identified in TES SNA, further system needs may be identified in the period between iterations of the Tomorrow's Energy Scenarios. Examples of changes that may arise include plant closures, changes to the condition of network assets and new connections that emerge through the connection offer process.

EirGrid and SONI published the TES 2023 consultation last autumn (Nov–Dec 2023). Following the consultation, further analysis and updates will be made to the TES. The plan for the TES is to publish the final report in the Spring of 2024.

12 https://www.eirgrid.ie/industry/tomorrows-energy-scenarios-tes
13 TES 2017 System Needs Assessment Report: https://cms.eirgrid.ie/sites/default/files/publications/TES-2017-System-Needs-Assessment-Final.pdf, TES 2019 System Needs Assessment Report: https://cms.eirgrid.ie/sites/default/files/publications/EirGrid-TES-2019-System-Needs-Assessment-Report_Final.pdf

1.4.3 Grid development strategy

We published our grid development strategy in January 2017[14]. In it we outlined our three strategy statements:

- Inclusive consultation with local communities and stakeholders will be central to our approach.
- Consideration of all practical technology options.
- Optimisation of the existing grid to minimise the need for new infrastructure.

Our strategy statements guide and influence how we develop the grid.

1.4.4 Capital expenditure

This plan includes 223 active projects that are underway. Funding for transmission projects is approved by the CRU through the price review process. The CRU approved allowable capital expenditure of €1.2 billion for network projects in the current five-year price review period 2021-2025, CRU/20/152[15].

The CRU and EirGrid have a framework in place for monitoring transmission capital expenditure. This framework provides flexibility to respond to the identified needs which are influenced by external factors, including changes in generation and demand, amongst others. Expenditure beyond 2025 will be considered and approved in future price reviews.

1.4.5 Climate Action Plan

In December 2023, the Irish Government launched its Climate Action Plan 2024, CAP 2024[16]. The plan reflects increased ambitions for the decarbonisation of Ireland's economy, including introduction of demand-side and generation-side flexibility-providing units to transform the electricity system. The plan also reveals schemes to facilitate increased renewable electricity generation investments compared to the previous Climate Action Plan.

Three key metrics were identified for the delivery of the decarbonisation goals in 2030:

1. Accelerating renewable energy generation by increasing the proportion of renewable electricity to 80%, introducing carbon budgets and sectoral emissions ceilings, a target of 9 GW from onshore wind and at least 5 GW offshore wind capacity, 8 GW from solar including 2.5 GW of new non-utility solar and, finally, green hydrogen production from renewable electricity surplus generation.

2. Accelerating flexibility by incorporating at least 2 GW of new flexible gas-fired generation to the grid, having in place long-term storage (4+ hours) and the development of zero-emission gas-fired generation from biomethane and hydrogen commencing by 2030.

3. Demand management by having demand side flexibility of between 20–30% and ensuring zero carbon demand growth.

14 Our Strategy 2020-2025 (EirGrid)
15 https://cruie-live-96ca64acab2247eca8a850a7e54b-5b34f62.divio-media.com/documents/CRU20152-TSO-and-TAO-Transmission-Revenue-2021-20252.pdf
16 https://www.gov.ie/pdf/?file=https://assets.gov.ie/279555/25df7bb5-1488-4ba1-9711-e058d578371b.pdf#page=null

The new targets for the electricity sector will enable the operation of the electricity system with higher levels of renewable energy more often, thereby reducing the average carbon intensity of electricity. At the same time, it will allow for the demand growth resulting from the electrification of heat and transport, thus reducing total emissions.

EirGrid will continue to monitor changes in climate and energy policy and update our development plans accordingly. We are focused not only on 2030 targets but also on the long-term ambition of net zero greenhouse gas emissions in Ireland by 2050 which is a legal requirement as set out in the Climate Action and Low Carbon Development (Amendment) Act 2021.

In September 2019, we launched our Strategy 2020-2025[17] which is shaped by two factors: climate change and the ongoing transformation of the electricity sector. We are committed to leading the change toward net zero carbon emissions from the electricity system and achieving renewable energy targets.

The TDP contains a list of the committed projects as of 31 January 2024. Additional projects will be included in future TDPs based on ongoing assessment of the impact of evolving climate and energy policies including revisions to the Government's Climate Action Plan.

EirGrid's plan for meeting CAP targets includes changes required to the network, operations, market and engagement with stakeholders needed. Thus, enacting all these identified system changes will lead to meeting the targets set out in the Climate Action Plan. EirGrid recognises that to meet the 80% RES-E by 2030 target and carbon budgets and sectoral emissions ceilings, significant change and investment is needed on the entire power system.

Key milestones and targets required to deliver on the required electrification and renewable energy targets by 2030 are set out in EirGrid's Shaping our Electricity Future (SOEF). Consequently, all the projects identified and reported in the TDP are all geared towards meeting the 80% RES-E 2030 target and carbon budgets and sectoral emissions ceilings.

17 https://www.eirgrid.ie/about-us/our-strategy-2020-2025

1.4.6 Shaping Our Electricity Future

The Government's first Climate Action Plan was published in 2019[18] setting out an ambitious plan for decarbonising Ireland's economy. Specifically, for the electricity sector, it set a target that at least 70% of our electricity will come from renewable energy sources (RES) by 2030.

In response to this, EirGrid initiated Shaping Our Electricity Future[19] with a core objective of establishing a roadmap for delivery of the 70% RES-E target. In March 2021, EirGrid launched a 14-week stakeholder consultation providing four options for how the target could be achieved. Reports obtained from this consultation were used to prepare the Shaping Our Electricity Future (SOEF) Version 1.0 which was published in November 2021.

The roadmap identified activities required across four separate workstreams: networks, operations, markets and stakeholder engagement. Network planning studies carried out for the networks workstream, which were based on projected demand and generation expansion identified in Tomorrows Energy Scenarios 2019, identified 40 candidate reinforcements that are required in addition to already committed network projects.

Our commitment to maximising the use of the existing grid is demonstrated by the study results; 35 of the 40 reinforcements involve the use of existing assets, replacement of existing assets or the use of non-network technologies such as power flow controllers or dynamic line ratings. The studies show that the additional projects assist in achieving RES-E annual average levels more than 70%, establishing a strong platform to achieve the long-term ambition of net zero emissions by 2050.

However, the rapidly changing electricity policy necessitated an update of the SOEF V1.0. This updated Shaping Our Electricity Roadmap to SOEF v1.1 which outlines our roadmap for preparing the grid so that, on an annual basis, 80% of electricity can come from renewable sources, such as wind and solar, by 2030. The updated Roadmap reflects various changes to climate change policies in 2022. In both Ireland and Northern Ireland, the targets of sourcing 70% of electricity from renewable generation by 2030 were increased to 80%.

Most significantly, in Ireland both carbon budgets and sectoral emissions ceilings were introduced and the Climate Action Plan 2023 set ambitious targets for installed capacities of renewable generation; these changes will require Ireland to have connected 9GW of onshore wind generation, 5GW of grid-connected offshore wind generation and 8 GW of solar PV generation by 2030. In comparison with the original SOEF roadmap, this is an increase of 3.3GW of onshore wind and 6.5GW of solar PV generation, whilst the offshore wind targets remain unchanged.

18 https://www.gov.ie/en/publication/ccb2e0-the-climate-action-plan-2019/
19 https://www.eirgrid.ie/shaping-our-electricity-future

Furthermore, the use of demand response and storage (including long duration energy storage) is an integral part of the SOEF Roadmap. From the Roadmap, planning assumptions include the continuous operation of Pumped Hydro Energy Storage (PHES) in Ireland and that there will be growth in Demand Side Units (DSU) and Battery Energy Storage capacities (BES). BES technologies are required in 2030 and beyond for reserve provision, capacity adequacy and to assist with congestion management. It is assumed that the energy-to-power ratio of the battery fleet will increase over the period to 2030 with mostly reserve-only batteries expected before 2025 followed by longer duration batteries capable of providing capacity, flexibility and reserve.

The updated SOEF outlines a pathway towards meeting the ambitious targets, but the scale of challenge is immense and EirGrid can only deliver on aspects of the roadmap that are within our remit. The delivery of the transition will demand unprecedented collaboration across the entire ecosystem as well as strong support from the public.

The roadmap takes a whole of system approach to delivering the required transformation of the power system. It considers transmission network development, public and stakeholder engagement, evolution of system operations and appropriately incentivising electricity markets.

An ongoing advisory council functions to discuss a variety of issues and concerns which could impact on the successful implementation of the SOEF vision, promotes the sharing of relevant related information and gathers input, advice and assistance on matters related to the SOEF programmes and their implementation.

1.4.7 Offshore grid development

Due to Ireland's location at the edge of the Atlantic, with a sea area of 490,000 square kilometres that is approximately seven times its landmass, Ireland has considerable offshore renewable energy potential.

In addition to onshore renewable energy development, meeting the government targets for 2030 will require development of significant offshore renewable energy infrastructure over the coming years. Harnessing our offshore renewable energy resources will play a key role in the transition towards a sustainable, secure and competitive energy system.

EirGrid will plan, develop and own the offshore transmission system, which will ultimately be managed according to a centralised model. Ownership of the offshore transmission system assets will be vested in EirGrid at all phases of offshore renewable energy development as provided for in legislation under the Maritime Area Planning (MAP) Bill 2021[20].

20 https://www.irishstatutebook.ie/eli/2021/act/50/enacted/en/html

Offshore grid development will be underpinned by a framework that provides for a phased transition from the current decentralised model towards an enduring centralised offshore grid model, to take place in line with three scheduled Offshore Renewable Electricity Support Scheme (ORESS) auctions. The Framework will progress in three phases transitioning from a primarily developer led approach in Phase One, to a centralised plan led approach in Phase Two and beyond. Under this plan led approach, EirGrid will plan and develop the offshore transmission infrastructure, with the potential, where possible, to optimise the connections of multiple projects to the offshore transmission system from areas deemed suitable for offshore renewable energy development.

Regarding Phase One, in May 2023, EirGrid completed the first offshore renewable energy auction (ORESS-1) on behalf of Department of the Environment, Climate and Communications (DECC). Over 3GW of capacity was procured from four offshore wind projects by DECC. EirGrid are now supporting these projects through the design process.

With respect to Phase 2 projects, in March 2023, the Irish Government published the 'Accelerating Ireland's Offshore Energy Programme; Policy Statement on the Framework for Phase Two Offshore Wind'[21]. This policy identified EirGrid as the developer of new offshore grid transmission infrastructure.

Based on the policy, EirGrid has initiated the South Coast Offshore Transmission Project, this will be the first state led offshore renewable electricity connection in Ireland. EirGrid has further conducted studies to assess possible connection methods for these offshore generation projects on the South Coast of Ireland. The exact connection methods are subject to further optioneering, environmental assessment and public consultation as the development is at a very early stage. EirGrid has publicly launched the project and has commenced engagement with the local communities.

Table 1-1 below shows the offshore projects and the corresponding planned capacities currently under development in different regions. The estimated energisation dates for all the projects is second quarter of 2027.

21 https://www.gov.ie/pdf/?file=https://assets.gov.ie/249823/bbd8b13c-73cd-46d4-9902-533fbf03d7fe.pdf#page=null

Table 1-1: Offshore Projects in Development

CP No.	Project name	Project size	Connection point	Region	Estimated energisation date
CP0749	Oriel Offshore Windfarm	210 MW	Oriel 220 kV station	Louth	30/06/2027
CP1393	Offshore Phase 1 Project 1 (Skerd Rocks)	450 MW	Carrowdotia 220 kV station	Clare	30/06/2027
CP1394	Offshore Phase 1 Project 2 (Codling Wind Park)	1,450 MW	Poolbeg 220 kV station	Wicklow	30/06/2027
CP1396	Offshore Phase 1 Project 4 (Arklow Bank wind Park)	800 MW	Glenart 220 kV station	Wicklow	30/06/2027
CP1397	Offshore Phase 1 Project 5 (North Irish Sea Array)	500 MW	Bremore 220 kV station	Dublin	30/06/2027
CP1398	Offshore Phase 1 Project 7 (Dublin Array)	824 MW	Jamestown 220 kV station	Dublin, Wicklow	30/06/2027

1.4.8 Interconnection to other Jurisdictions

The island of Ireland is currently connected to the Great Britain (GB) electricity transmission system by 2 interconnectors. One of these connects to Northern Ireland and one to Ireland.

The Moyle Interconnector comprises a 500MW HVDC cable connecting converter stations in Islandmagee, County Antrim and Auchencrosh in Ayrshire, Scotland. The East West Interconnector (EWIC) comprises a 500MW HVDC cable connecting converter stations at Portan in Ireland and Shotton in North Wales.

Two further interconnectors are being constructed:

- During 2024, the Greenlink interconnector should begin operation. This HVDC interconnector will provide 500MW of capacity between Great Island substation and National Grid's Pembroke substation in South Wales. Details of this project are provided in section 5.4 of this report.
- In 2027, the Celtic interconnector should begin operation. This HVDC interconnector will provide 700MW of capacity between Knockraha substation and RTE's La Martyre substation in Britany, France. The Celtic Interconnector will provide the first direct connection between the SEM and Continental Europe. Further details of this project are provided in section 5.3 of this report.

Two other interconnector projects are planned and included in the TYNDP produced by ENTSO-E:

- MaresConnect would comprise a 750MW HVDC interconnector between the transmission system in the Greater Dublin area and the GB transmission system in Denbighshire, North Wales. MaresConnect is targeted for operation by 2029 and was included in the 2022 list of TYNDP projects. It is also included in the draft list of projects for the TYNDP 2024.
- LirIC would comprise a 700MW HVDC interconnector between the 275kV transmission system in Northern Ireland and the 400kV transmission system in Scotland. LirIC is targeted operation by 2030 and was included in the 2022 list of TYNDP projects. It is also included in the draft list of projects for the TYNDP 2024.

Neither the MaresConnect nor LirIC projects have agreed connections to the transmission networks in Ireland and Northern Ireland respectively.

Offshore renewable energy development in Ireland

Ireland has ambitious goals to install offshore renewable energy including offshore windfarms (OWF). As well as a target to install 5GW of offshore generation capacity by 2030 through the Phase 1 and Phase 2 work described in Section 1.4.7, longer term non-binding goals include the connection of 20GW of generation by 2040 and 37GW by 2050.

To facilitate the large-scale development of offshore generation, additional offshore transmission capacity will be required to enable the connection of OWF to the existing onshore transmission system in Ireland and to other locations where the renewable energy may be used. If offshore generation is developed at the levels being targeted, it is likely that offshore renewable energy output (alongside onshore renewable energy), will exceed current and forecast energy requirements on the island of Ireland. New interconnection capacity, in addition to the projects that are under construction are likely to be required to enable the export of electricity to other jurisdictions.

The objectives for further interconnection and the export of renewable energy to other jurisdictions are explicitly supported by Government via the 2023 National Interconnector Policy Statement and are referenced in other policy documents such as the Offshore Future Framework.

By their nature, interconnection projects are technically complex, can have major social and environmental impacts and will involve multiple stakeholders. Typically, interconnector projects take 15 years or more from initial inception to commercial operation. Early assessment and identification of interconnection projects will be required to secure resource and to ensure projects can be provided in time to match wider offshore generation objectives.

Hybrid and point to point interconnectors

The existing interconnectors between Ireland and the UK and the interconnectors that are under construction to GB and France are direct 'point-to-point' HVDC connections. These connect onshore converter stations in Ireland and Northern Ireland to converter substations in Great Britain and France via subsea HVDC cables.

Increasingly, hybrid (or multipurpose) interconnector projects are also being considered. Such projects can combine offshore generation connection and interconnection through the provision of transmission substations located on offshore platforms. Where offshore generation resources are being developed, hybrid interconnectors have the potential to provide significant advantages when compared to point-to-point interconnector projects. Firstly, they can reduce the number of cable landings to shore as OWF can be connected directly to offshore transmission substations. Secondly, hybrid interconnector projects provide connection capacity for generation as well as transfer capacity between electricity transmissions.

These factors can reduce the environmental impact of electricity transmission and ensure that the transmission infrastructure is more efficiently utilised.

In its 2023 Policy Statement on Interconnection, the Irish government explicitly included objectives in relation to hybrid interconnection. Further, the Irish government has entered into bilateral and multilateral agreements with the UK, France and Belgium to explore further interconnection.

Given their potential advantages, hybrid interconnector projects should be considered alongside point-to-point interconnectors. Most European TSOs in jurisdictions where large-scale offshore wind resources are being developed are now assessing hybrid transmission infrastructure.

EirGrid's interconnection activity

EirGrid recognise that further electricity interconnection (including hybrid interconnectors) is likely to be needed given Ireland's ambition to develop largescale offshore wind beyond 2030. As Transmission System Operator in Ireland, EirGrid already has an obligation "to explore and develop opportunities for interconnection of its system with other systems". In addition, as the entity responsible for developing offshore transmission infrastructure for Ireland, EirGrid is considering opportunities to develop offshore infrastructure including interconnection capacity in an efficient and timely way.

In line with these obligations and guided by the July 2023 National Policy Statement on Electricity Interconnection, EirGrid is already exploring opportunities for further interconnection with neighbouring TSOs. Additionally, within the Ostend TSO's group formed after the Ostend Agreement of April 2024, EirGrid is working with other North Seas TSOs to develop and assess hybrid interconnector opportunities and the policy that will enable their operation. All this development should fit within the plan-led approach to offshore development in Ireland.

EirGrid recognise that other parties will have ideas to develop further interconnection projects. We welcome the discussion of potential projects with other TSOs and with project developers where these projects fit within the developing policy for Ireland. Given their potential advantages we would also welcome opportunities to discuss hybrid interconnection.

1.5 Regional view

Power flows on the transmission network are not contained within specific counties, as the transmission network is meshed, meaning multiple pathways for the power to travel and spans across the entire country. To help project reporting and give a regional view to our TDP we group counties together to create regions. In the TDP we use three regions to help communicate the development of the transmission system in Ireland:

- The Border, Midlands and West.
- The Midwest and Southwest.
- The Southeast, Mideast and Dublin.

These three regions are made up of eight underlying statutory regions and associated counties as follows:

- Border: Donegal, Sligo, Leitrim, Cavan and Monaghan.
- Midlands: Longford, Westmeath, Offaly and Laois.
- West: Mayo, Galway and Roscommon.
- Southwest: Kerry and Cork.
- Midwest: Clare, Limerick and Tipperary[22].
- Southeast: Waterford, Wexford, Kilkenny and Carlow.
- Mideast: Wicklow, Kildare, Meath and Louth[23].
- Dublin.

22 Formerly Tipperary was split into North Tipperary, which was in the Midwest region and South Tipperary which was in the South-East region.
23 Formerly Louth was in the Border region.

These eight regions are Ireland's regions as per the Nomenclature of Territorial Units for Statistics (NUTS) 3 classification. These regions are also used by government agencies in Ireland, including IDA Ireland and the Central Statistics Office.

The eight statutory regions are illustrated in Figure 1-3 below.

Projects are described by region in Chapter 5 'Regional view'.

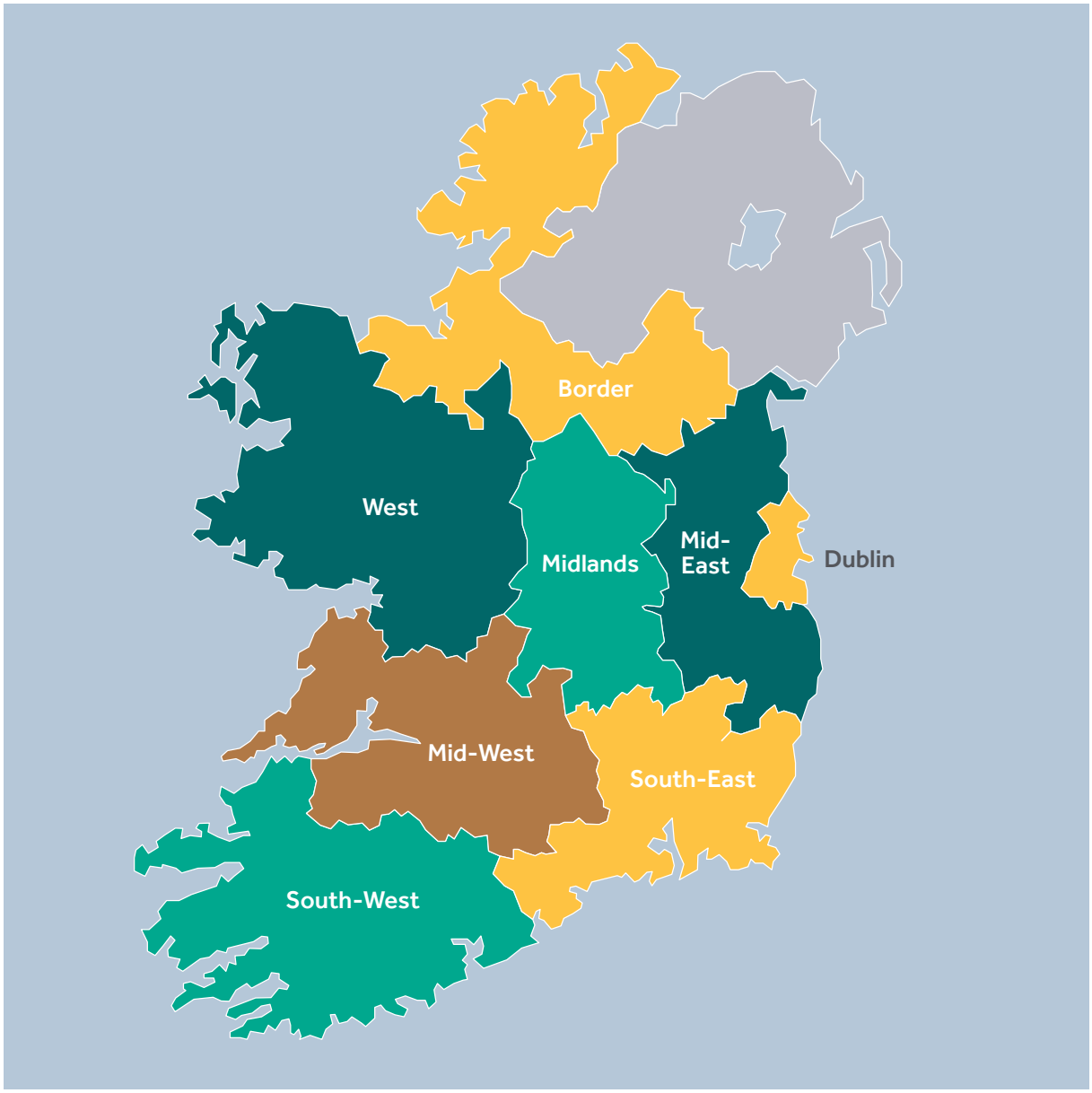


Figure 1-3: Illustration of Ireland's regions as per the Nomenclature of Territorial Units for Statistics (NUTS) 3 classification

2. Investment drivers

The Irish Government's Energy White Paper[24] released in December 2015 set out Ireland's energy future and it continues to be valid. The Climate Action Plan published in December 2023 reflects more recent national and European policy developments. A target of 80% RES-E is detailed in Ireland's Climate Action Plan 2024[25], which is Ireland's contribution to the European Union's effort-sharing approach of the Clean Energy Package.

Investment in the transmission system is therefore necessary to enable Ireland's transition to a low carbon energy future. In this regard, the TDP is developed to support Government objectives and enable this energy transition.

2.1 Strategic context of transmission network investment

The ability to provide all customers with a secure, efficient, reliable and stable electricity supply is essential for Irish society and to enable economic activity and economic growth.

The Irish electricity industry and its development take direction from several broad national and European[26] strategic objectives.

These objectives guide investment in the Irish transmission network and are summarised as follows:

- Ensuring the security of electricity supply.
- Ensuring the competitiveness of the national economy.
- Ensuring the long-term sustainability of electricity supply in the country.

24 https://www.gov.ie/en/publication/550df-the-white-paper-irelands-transition-to-a-low-carbon-energy-future-2015-2030/
25 https://www.gov.ie/pdf/?file=https://assets.gov.ie/279555/25df7bb5-1488-4ba1-9711-e058d578371b.pdf#page=null (www.gov.ie)
26 https://ec.europa.eu/energy/topics/energy-strategy/clean-energy-all-europeans_en

To ensure these objectives are met, we must provide ongoing and timely reinforcement of the Irish transmission network.

As the TSO for Ireland, EirGrid has a statutory duty to support the development of the Irish economy and society by ensuring the transmission network can support all reasonable demands for electricity. In addition, we are required to enter into agreement for connection with parties seeking to connect to the network under terms approved by the CRU.

Changes to demand, generation, or to interconnection with neighbouring transmission networks may alter the flow of electrical power throughout the Irish transmission network. To accommodate these changes in power flows it is often necessary to reinforce the transmission network to ensure adequate performance and reliability levels are maintained.

2.2 Policy and technical drivers of transmission network investment

Ireland's commitment to achieving energy resilience has necessitated an ambitious climate action plan. This plan, in conjunction with the net zero target by 2050 at the EU level, led to the adoption of a number of energy dimensions to ensure that these objectives are met. These dimensions are set out expressly in the National Energy and Climate Plan (NECP) which is a mechanism by which Ireland's 2030 energy and climate targets, policies and measures and progress to targets is reported to the European Commission. These dimensions outline the key objectives, policies and measures of the energy and climate plan. In developing the transmission development plan, these measures are adapted to align with the nature of the projects brought forward to the planning and execution stage. These are referred to as the drivers for the transmission investment projects and they are highlighted below:

1. Security of supply.
2. Market integration (competitiveness).
3. Sustainability.
4. Asset management.

2.2.1 Security of supply

Security of supply deals with generation adequacy and the availability of generation to meet the fluctuating demand needs over time. It also concerns the reliability and security of the transmission network. Hence, electricity policy seeks to promote broadening the country's access to generation and promotes further interconnection with neighbouring countries[27]. Policy also seeks to promote the timely development of the transmission network to maintain an acceptable level of performance and reliability. Security of supply is described from the perspective of demand, generation and the actions being taken to address the operation challenges related to reliability and security of the transmission system.

Demand growth, arising from connection of new demand or during periods when power is exported (via interconnectors), can give rise to higher power flows which may trigger the need to reinforce the network. Closure or reduction in the size of demand facilities can reduce the power flows on lines feeding the load. However, in certain cases where the demand is absorbing local generation and reducing the amount of generation exported from the area, the closure can lead to increased power flows on other corridors leaving that area.

Due to the relative size of individual generators, changes in generation installations, whether new additions or closures, can have a more significant impact on power flows than demand. This is equally true in the case of interconnectors which are treated as generators during periods of power import. The addition of new generation capacity requires network development to connect the new generators to the network. The new generation capacity will inevitably alter the power flows across the network, which has the potential to create overload problems deep into the network. To resolve these overloads, we need further reinforcements to allow full network access. The All-Island Generation Capacity Statement (GCS) 2023-2032[28], details expected changes in demand, generation and interconnection. The changes are summarised at the system-level. Additionally, the annual All-Island Ten-Year Transmission Forecast Statement (TYTFS) 2022[29] describes the expected changes in demand, generation and interconnection at the individual station level.

Reinforcements such as line uprates (i.e., enhancing the electrical capacity of a cable or line), strategic infrastructure capacity increases, provision of flexibility providers to enhance stable and reliable operation, and facilitation of increased demand connections via increased line thermal, and dynamic capacities are some of the actions being undertaken to ensure security of supply.

27 https://www.gov.ie/pdf/?file=https://assets.gov.ie/278473/4919d4e2-44ea-454a-855a-0229eeda4f4f.pdf#page=null
28 https://cms.eirgrid.ie/sites/default/files/publications/19035-EirGrid-Generation-Capacity-Statement-Combined-2023-V5-Jan-2024.pdf
29 https://cms.eirgrid.ie/sites/default/files/publications/All%20Island%20Ten%20Year%20Transmission%20Statement-2022.pdf

2.2.2 Market Integration (Competitiveness)

Low or competitively priced electricity is viewed as the product of a competitive electricity market. As a result, electricity policy generally seeks to promote increased competition. This is achieved through further market integration, by removing network constraints and broadening the market by interconnecting with neighbouring electricity markets. National and EU policy recognises the economic and technical benefits associated with increased interconnection and therefore seeks to promote this between European transmission systems. Increased interconnection between transmission networks results in a larger energy market, thus increasing competition and the potential for price reduction. These factors drive the need for network reinforcements over the next ten years and beyond.

2.2.3 Sustainability

Ireland is heavily reliant on imported fossil fuels for the generation of electricity. However, this dependence poses challenges, not only for the long-term development of the Irish economy, but also due to contribution to the production of greenhouse gases. To mitigate these issues, Ireland's electricity policy focuses on integrating energy from onshore and offshore renewable sources to reduce reliance on imported fuels and reduce production of greenhouse gases. To facilitate sustained utilization of the renewable sources, flexibility providing assets such as energy storage systems (including long term storage systems) are also being promoted as part of transmission infrastructure development plans.

The revised Irish Governments' Climate Action Plan reflects increased ambitions for the decarbonisation of Ireland's economy including a target of 80% RES-E by 2030. EirGrid is focused not only on 2030 targets but also on the long-term ambition of net zero greenhouse gas emissions in Ireland by 2050 which is a legal requirement as set out in the Climate Action and Low Carbon Development (Amendment) Act 2021.

To meet decarbonisation targets in the electricity sector, investment will be needed and has progressed in new renewable generation capacity, flexibility-providing units, system service infrastructure and electricity networks. The transition to low-carbon and renewable energy is significant and will require a noteworthy transformation of the electricity system.

2.2.4 Asset Management

Factors such as equipment age and maintenance, type of technology used, environment and degree of usage affect transmission assets and thus impact systems operation. To guarantee safe and secure operation, regular asset condition assessments are carried out and then tasks such as asset refurbishment and/or replacement are undertaken. Replacement/ Refurbishment could be done using the exact equipment rating or with higher rated versions for current or future needs.

3. Changes to the plan since 2023

TDP 2024 – 2033 has a data freeze date of 31st January 2024 while TDP 2023 had a freeze date of 21st December 2022.

There were 202 active projects in TDP 2023. Since then:

- Twenty (20) projects have been completed/energised.
- Two (2) projects have been removed.
- Three (3) projects have been put on hold.
- Three (3) new projects were added in the period covered by TDP 2023 but excluded in the previous iteration due to early data freeze date.
- Forty-three (43) new projects have been added to the development plan in the period covered by the current TDP.

Thus, there are 223 active projects in this version of the TDP. These projects have not been energized and they are identified by region in Chapter 5.

A temporary 220 kV cable diversion (CP1274) was initiated in 2023. This project is in Castlelost site and it was completed also in 2023 (hence, it's exclusion from the numbers stated above).

3.1 Projects completed in 2023

Twenty (20) projects were energised and/or completed in 2023 and they are listed in Table 3-1.

For a full evaluation of delivery and performance of the annual Transmission Capital programme, readers are directed to our website[30] for the reports from 2020–2023.

The reports are in line with the CRU Reporting and Incentives decisions for Price Review 4 (2016–2020), CER/18/087[31] and Price Review 5 (2021–2025), CRU/20/154[32].

Table 3-1: Projects completed in 2023

No.	CP No.	Project title
1	CP0668	Corduff – Ryebrook 110 kV Line Uprate
2	CP0824	Moneypoint – Oldstreet 400 kV Line Refurbishment
3	CP0825	Oldstreet – Woodland 400 kV Line Refurbishment
4	CP0837	Bellacorrick 110 kV Station T141 Uprate
5	CP0902	Tarbert – Trien 110 kV No 1 Line Refurbishment
6	CP0933	Thurles 110 kV Station – Statcom
7	CP0934	Ballynahulla 220 – 110 kV Station – Statcom
8	CP0935	Ballyvouskill 220 – 110 kV Station – Statcom
9	CP1020	Blundelstown 110 kV Station (South Meath Solar Farm)
10	CP1029	Capital Project 1029
11	CP1068	Tullabeg Solar 110 kV Station
12	CP1090	Rathmullan 110 kV Station
13	CP1094	Buffy 110 kV Station
14	CP1102	Grangecastle South
15	CP1105	Poolbeg BESS and FlexGen
16	CP1117	Irishtown FlexGen-BESS
17	CP1127	Lenalea Windfarm
18	CP1181	Corduff Platin 110 kV Line Conflict
19	CP1224	Lysaghtstown 110 kV Station
20	CP1229	Lislea 110 kV Station – Drumlins WF

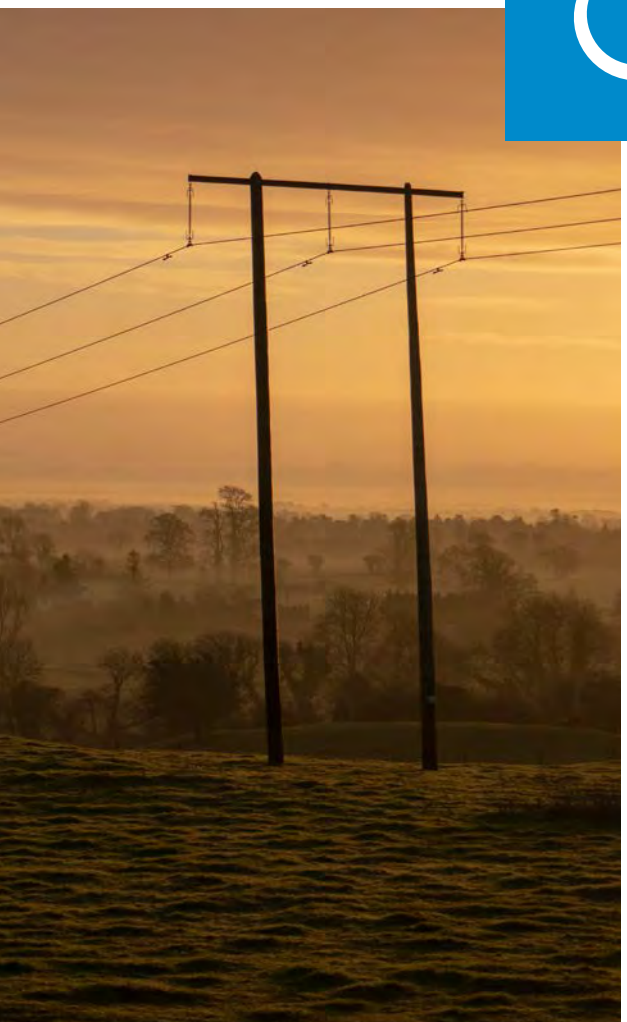
30 https://www.eirgrid.ie/industry/tso-regulatory-publications
31 https://cruie-live-96ca64acab2247eca8a850a7e54b-5b34f62.divio-media.com/documents/CRU18087-Reporting-and-Incentives-under-Price-Review-4-Decision-Paper.pdf
32 https://cruie-live-96ca64acab2247eca8a850a7e54b-5b34f62.divio-media.com/documents/CRU20152-TSO-and-TAO-Transmission-Revenue-2021-20252.pdf

3.2 Projects removed in 2023

Two projects have been removed. Blundelstown 110 kV Station New DSO Transformer Bays (CP1243) was removed due to customer not progressing with the project. Grahormick Solar (CP1261) was removed due to customer delays on planning.

Table 3-2: Projects removed in 2023

No.	CP No.	Project title
1	CP1243	Blundelstown 110 kV Station – 2 New DSO Transformer Bays
2	CP1261	Grahormick Solar



3.3 Projects added in 2023

Forty-three (43) new projects received capital approval and were added to ongoing projects in 2023. Additionally, three (3) projects were added since the previous TDP as they received Capital Approval after the data freeze dates used for TDP 2023. The projects include 16 New build connections, 4 New build capacity, 10 Replacements, 13 modifications to the system, 1 redevelopment project, 1 project termed climate change adaptation measures and a cable diversion.

Table 3-3: Projects added in 2023

No.	CP No.	Project title
1	CP1002	Cushaling – Newbridge 110 kV Thermal Uprate
2	CP1003	Cushaling – Portlaoise 110 kV Line Uprate
3	CP1086	Dunstown T4201 and Woodland T4201 Transformer Replacement
4	CP1104	Pollaphuca Refurbishment Project
5	CP1182	Transformer Restoration Project
6	CP1195	Turlough Hill 220 kV Station Refurbishment
7	CP1198	Barnakyle MIC Increase
8	CP1223	Bandon 110 kV Busbar Rating Needs
9	CP1238	Arklow 220 kV Station Redevelopment
10	CP1250	Sprecher and Schuh Circuit Breaker Replacement
11	CP1257	Kilshane Power Station
12	CP1281	Batter Lane DSO Station

No.	CP No.	Project title
13	CP1282	Clogher-Drumkeen 110 kV Line Alteration
14	CP1284	Walterstown 110 kV Station DSO
15	CP1286	Tonroe 110 kV Station DSO
16	CP1287	Ringsend Cable Diversion
17	CP1291	Carlow 110 kV Station Busbar Thermal Capacity Need
18	CP1296	Rinawade 110 kV GIS Station (Liffey Park)
19	CP1297	Glansillagh 220 kV Station
20	CP1300	Climate Change Adaptation Measures
21	CP1304	Strategic Spares for OHL, Stations and Cables
22	CP1311	Athlone – Lanesboro 110 kV Line Uprate
23	CP1321	Cashla – Dalton 110 kV Circuit 1 (DLR)
24	CP1322	Cathaleen's Fall – Coraclassy 110 kV Circuit 1 (DLR)
25	CP1329	Stonestown 110 kV Station (Derrinlough Wind Farm)
26	CP1334	Newbarn 110 kV Station (Fieldstown Solar Farm)
27	CP1335	Garballagh 110 kV Station (Garballagh 2 Solar Farm)
28	CP1338	ECP2.2 P451 Effernoge 110 kV Station (Tomsallagh Solar)
29	CP1341	Cloon 110 kV (Barnacurragh Solar Park)
30	CP1342	Drumcamill 110 kV Station (Monvallet Hybrid Solar and Battery Farm)

No.	CP No.	Project title
31	CP1346	Meath Hill 110 kV Station (Ardagh South Energy Storage)
32	CP1347	Dunbrody 110 kV Station (Kilmannock Battery Storage Facility Phase 2)
33	CP1351	Ballynadrideen 110 kV Station (Ballyroe Solar)
34	CP1352	Gortatleva 110 kV Station (Ballymoneen Solar Park)
35	CP1353	Bendinstown 110 kV Station (Garreenleen Solar)
36	CP1354	Coolshamroge 110 kV Station (Manusmore Solar Park)
37	CP1355	Corbetstown 110 kV Station (Garr Solar and Storage)
38	CP1390	Maynooth – Rinawade 110 kV Line Uprate
39	CP1391	Maynooth-Derryiron-Timahoe 110 kV Line Uprate
40	CP1403	Rinawade – Dunfirth 110 kV Uprate
41	CP1412	Knockraha 220 kV Transformer Replacement (T2102)
42	CP1414	Kilcumber 110 kV Station (Cloncreen Battery Phase 2)
43	CP1428	Cashla – Dalton 110 kV Thermal Capacity
44	CP1429	Castlebar – Dalton 110 kV Thermal Capacity
45	CP1437	CAR for Clahane-Tralee 110 kV Circuit
46	CP1438	CAR for Glanagow – Raffeen Circuit Alteration

3.4 Projects on hold

As of 31st January 2024, there were three projects on hold. CP1045 is currently placed on hold because the site is being assessed for alternative uses before any final decision is made. CP1052 and CP1061 were put on hold by the customer. They are shown in Table 3-4 below.

Table 3-4: Projects on hold

No.	CP No.	Project title
1	CP1045	Finglas Land Acquisition
2	CP1052	Knocknamona Wind Farm
3	CP1061	Shantallow 110 kV Station (Shantallow Solar Farm)

3.5 Candidate solutions progressing through the framework for grid development

Shaping Our Electricity Future v1.0 identified candidate solutions for network reinforcement and these are becoming committed projects as they work their way through EirGrid's Framework for Grid Development. As an update on TDP 2023, more projects have been committed and are being brought through the project development framework (CP1321, CP1390, CP1391 and CP1403). The candidate solutions progressing through the framework for grid development are given in the Table 3-5. Projects in steps 1-3 are reported as 'early-stage' and projects in steps 4-6 are reported as 'committed' projects, see Appendix B for more information on EirGrid' six-step Framework for Grid Development process.

Table 3-5: Candidate solutions identified in SOEF v1.0

S/N	CP. No	Candidate solution	Region	Status
1	CP0808	Maynooth 220 kV Station Reconfiguration	Mideast	Committed
2	CP1021	East Meath – North Dublin Reinforcement	Dublin	Committed
3	CP1100	Finglas – North Wall Cable Replacement	Dublin	Committed
4	CP1146	Carrickmines – Poolbeg 220 kV Cable Replacement	Dublin	Committed
5	CP1150	Inchicore – Poolbeg 2 220 kV Cable Replacement	Dublin	Committed
6	CP1157	Inchicore – Poolbeg 1 220 kV Cable Replacement	Dublin	Committed
7	CP1191	Cashla-Galway 110 kV Circuit 1 Line Uprate	West	Committed
8	CP1211	Bandon Dunmanway 110 kV Circuit Thermal Capacity	Southwest	Committed
9	CP1216	Poolbeg – North Wall 220 kV Cable Replacement	Dublin	Committed
11	CP1235	Louth – Woodland 220 kV Uprate	Mideast	Committed
11	CP1242	Great Island 220-110 kV Transformer Upgrades	Southeast	Committed
12	CP1321	Cashla – Dalton 110 kV Circuit 1	West	Committed
13	CP1390	Maynooth – Rinawade 110 kV Line Uprate	Mideast	Committed
14	CP1391	Maynooth-Derryiron-Timahoe 110 kV Line Uprate	West	Committed
15	CP1403	Rinawade – Dunfirth 110 kV Uprate	Mideast	Committed
16	CP0982	Flagford Sligo Capacity Needs	Northwest	Early stage
17	CP1196	Arklow – Ballybeg – Carrickmines 110 kV Capacity Needs	Southeast	Early stage
18	CP1226	South Dublin Reinforcement Combined With West County Dublin Bulk Supply Point (BSP)	Dublin	Early stage
19	CP1233	Donegal – Srananagh Corridor	Northwest	Early stage
20	CP1318	Binbane – Clogher – Cathaleen's Fall – 110 kV Clogher Tie-in	Northwest	Early stage

3.5.1 SOEF v1.1

The candidate reinforcements identified as part of the updated Shaping Our Electricity Future Roadmap v1.1 are in addition to the committed projects and solutions in Shaping Our Electricity Future v1.0 and the solutions progressing through the framework for grid development will be reported in future TDPs.

A list of those candidate reinforcements can be found on the Appendix 4 of the Shaping Our Electricity Future v1.1 roadmap[33] report and are reproduced below in Table 3-6.

All candidate solutions identified as part of Shaping Our Electricity Future v1.1 will need to enter EirGrid's Framework for Grid Development process and they will be reported in future TDPs as they receive capital approval.

Table 3-6: Candidate solutions identified in SOEF v1.1

S/N	Candidate solution	Path	Domain	Region	Status
1	Baltrasna – Corduff 110 kV	New	Static device (DLR)	Mideast	Early stage
2	Corduff – Blundelstown – Mullingar 110 kV	Uprate	Circuit	Mideast	Early stage
3	Maynooth – Castlelost 220 kV	Uprate	Circuit	Mideast	Early stage
4	Deenes – Drybridge 110 kV	New	Static device (DLR)	Northeast	Early stage
5	Gorman – Maynooth 220 kV	Uprate	Circuit	Northeast	Early stage
6	Meath Hill – Louth 110 kV	New	Static device (DLR)	Northeast	Early stage
7	Lisdrum – Louth 110 kV	New	Static device (DLR)	Northeast	Early stage
8	Ratrussan – Shankill 110 kV	New	Static device (DLR)	Northeast	Early stage
9	Letterkenny – Golagh T 110 kV	Uprate	Circuit	Northwest	Early stage
10	Cashla – Dalton 110 kV	Uprate	Circuit	Northwest	Committed
11	Castlebar – Dalton 110 kV	Uprate	Circuit	Northwest	Committed
12	Srananagh – Cathaleen's Fall 2 110 kV	New	Static device (DLR)	Northwest	Early stage
13	Crane – Wexford 110 kV	New	Static device (DLR)	Southeast	Early stage
14	Cullenagh – Waterford 110 kV	New	Static device (PFC)	Southeast	Early stage
15	Great Island – Waterford 1 110 kV	New	Static device (DLR)	Southeast	Early stage
16	Drumline – Ennis 110 kV	New	Static device (DLR)	Southwest	Early stage

33 Shaping Our Electricity Future Roadmap: Version 1.1 (EirGrid)

4. Planned network developments

This chapter summarises the network development projects arising from the transmission network development planning process (outlined in Appendix B). Projects are described in greater detail in Chapter 5.

4.1 Overview of the plan

The TDP includes 223 projects that are active and in progress. These projects are categorised as one of the following: New build; Uprate/Modify; Refurbish/Replace; or Other.

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.

New build projects are divided into two categories:

- **New build connection**: new connection projects; and
- **New build capacity:** projects that deliver additional grid capacity.

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 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 refurbishment 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.

Other

Projects that do not fall naturally into any of the three categories above.

Table 4-1 below summarises the active projects into their respective categories and regions.

Table 4-1: Summary of projects by category and region

Project category	Border, Midlands, West	Southeast, Mideast, Dublin	Southwest, Midwest	Projects at multiple locations	Total
New build	31	49	15	–	**95**
Uprate/Modify	28	20	10	2	**60**
Refurbish/Replace	9	27	16	8	**60**
Other	–	4	–	4	**8**
Total	**68**	**100**	**40**	**15**	**223**

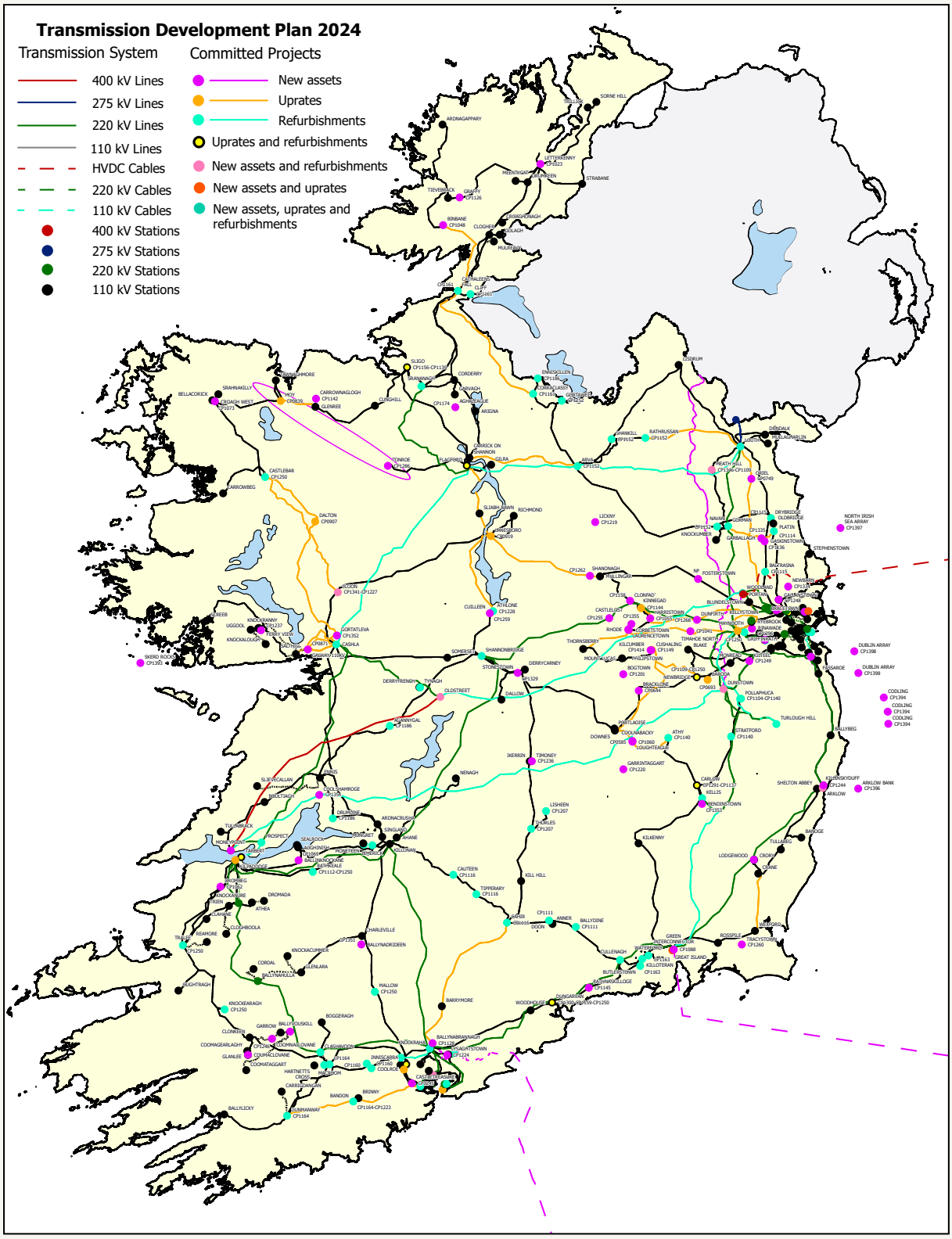
4.2 Summary of projects in Steps 4 to 6

Figure 4-1 shows all projects in Step 4–Step 6. All new developments shown in Figure 4-1 are subject to environmental assessment as appropriate in accordance with the relevant planning requirements. For those projects not yet in the planning process, the location of the reinforcements shown on the map are indicative only and do not represent preferred routes/locations. A full list of projects and their corresponding step in the grid development process is given in Chapter 5.

4.2.1 Works outside scope of this plan

In addition to the projects summarised in this chapter, we also coordinate capital projects which are classified as minor capital works with the TAO, such as minor station alterations. These projects are numerous and generally deal with the day-to-day operation and maintenance of the network. These are not included in the TDP.

Figure 4-1: Planned network developments in Steps 4 to 6 of our six-step process



4.3 Project delivery

The development of the transmission network is subject to delivery risk. We use risk management plans and processes to identify, analyse, monitor and manage project and programme risks. These plans and processes facilitate the management of project dependencies and critical path issues within the context of a changing environment.

Dates related to project completion are provided by EirGrid's Network Delivery Portfolio (NDP) quarterly publication which includes 3 major milestones, EirGrid Capital Approval (GW3), Project Agreement with ESB Networks (GW6) and the forecast energisation date (EI). The dates indicated in the NDP are based on an unconstrained scenario and are, therefore, indicative and subject to change. These dates are reported in the tables in Chapter 5 using the Q4-23 NDP milestone data.

The project schedule is developed initially using standard lead times for generic project types. As a project moves forward through the six steps, a detailed schedule is developed and maintained, milestones are achieved and there is increasing certainty regarding the completion date. The following points need to be considered when considering project progression and risk:

- Current level of project maturity.
- Outage availability.
- Land access, planning and consent risks.
- Project complexity.

We differentiate between low, moderate and high-risk projects based on project type and project step. Projects that are due for completion in the near-term generally carry less risk than those due for completion in later years. Line and station projects which are due to be completed in the near-term are within the moderate risk category. Large-scale linear developments scheduled to be completed in later years tend to have a higher level of risk associated with them. When interdependent projects take place at the same time, care must be taken while scheduling the required outages. Therefore, the region or location of a project also has an impact on its risk profile. Transmission outage planning is an iterative and ongoing process which is a core aspect of project delivery.

EirGrid's Shaping Our Electricity Future Roadmap identifies network projects as a strategic enabler to achieving 2030 RES-E targets. The programme of network investment needed in advance of 2030 is significant and requires both EirGrid and ESB Networks to streamline how grid infrastructure is delivered. EirGrid and ESB Networks will develop and implement an end-to-end TSO/TAO joint approach to optimise delivery of grid infrastructure projects.

As mentioned, in the project tables in Chapter 5 expected and indicative delivery dates are reported. Some of the more common reasons for changes in Project Agreement or Energisation dates are as follows:

- Difficulty in achieving outages, particularly for brown field station projects and projects in the Northwest.
- Changes in a customer's plans.
- Difficulties gaining access to land.
- Changes in project scope.
- Increasing planning consent and environmental requirements.
- Issues with the quality of contestable builds.

EirGrid publishes the NDP on a quarterly basis to communicate updates and changes to the portfolio to stakeholders. In such cases, we endeavour to communicate with and mitigate impacts on customers.

4.4 Completion dates

Information in this document with reference to completion dates (Estimated Completion Dates, Forecast Completion Dates and Indicative Completion Dates) has been prepared with all reasonable care and diligence. All and any dates have been estimated and are indicative and subject to change. All dates have been estimated as required under with the European Union (Internal Market in electricity) Regulations 2022 (S.I. no 227/2022)[34] and are subject to revision.

34 https://www.irishstatutebook.ie/eli/2022/si/227/made/en/print#:~:text=No.,227%2F2022%20%2D%20European%20Union%20(Internal%20Market%20in,Electricity)%20(3)%20Regulations%202022&text=%E2%80%9CIris%20Oifigi%C3%BAil%E2%80%9D%20of%2013th%20May%2C%202022.&text=1.,)%20(3)%20Regulations%202022.

5. Regional view

This chapter details the committed projects as of the data freeze date, 31st January 2024. Committed projects are those projects that are in Steps 4-6 of our six-step process for developing the grid. Committed projects have received EirGrid capital approval which occurs at the end of Step 3. As per Section 4.4, indicative completion dates are included for these projects.

5.1 Overview

This chapter describes the projects including their drivers, needs, location, EirGrid Capital Approval dates (GW3), Project Agreement with ESB dates (GW6), forecast energisation date (EI), capital project number (CP No.) and step in the six-step process for developing the grid.

Projects are categorised by region, as per Figure 1-3 shown in Chapter 1.

Table 5-1 summarises the number of active projects by region.

Table 5-1: Summary of active projects by region

Region	No. of active projects
Border, Midlands and West	68
Southeast, Mideast and Dublin	100
Southwest and Midwest	40
Projects at multiple locations[35]	15
Total	**223**

35 These involve multiple individual projects at various locations around the country.

5.2 The Border, Midlands and West

Summary of projects

Project category	No. of projects
New build	31
Uprate/Modify	28
Refurbish/Replace	9
Total	**68**

Active TDP projects by region

The Border, Midlands and West region has a wide variety of generation sources. These are dispersed around the region and include wind, solar, storage, hydro, diesel, gas and a biomass power station. The existing transmission network is predominantly 110 kV and 220 kV. There is limited high capacity 400 kV infrastructure in the southern part of the region. It is important to note that the Northwest area is relatively isolated from the 220 kV network and comprises of a network of 110 kV circuits, many of which are long lines and is characterised by a strong wind resource and a low electricity demand. Development of this network is mainly required to connect a high level of renewable generation.

There are two connections to Northern Ireland transmission system in the Border, Midlands and West, however power flows on these links are controlled to zero MW using Phase Shift Transformers for system security reasons.

While the eastern part of the country has seen significant increases in large new industry demand, the West and Northwest have seen a large amount of renewable generation connections with many requests for further connections. This level of generation is greater than the capacity of the network resulting in local constraints related to power-transfer needs. To cater for high levels of renewable generation, network reinforcement is necessary. This will enable the efficient export of generation from this area towards areas with high load, such as the east coast.

One of the main challenges involved in the grid development of the Northwest is the fact that there are limited opportunities for controlled outages and multiple simultaneous circuit outages for maintenance, uprating, new connections, or substation works, are often not possible. We will continue to assess reinforcement needs in the Northwest and to identify candidate solutions as part of the Shaping Our Electricity Future update, aiming to find new projects required in the area beyond those already progressing through the grid development process.

This initiative will include a review of outage requirements and durations during construction as well as consideration of outages during project initiation and decision making. This process will seek to minimise the requirement for outages during construction where possible. EirGrid and ESBN will continue to work closely to deliver the outage programme and in turn, the grid delivery programme, as effectively and efficiently as possible in all areas of the network requiring reinforcement including the Border, Midlands and West.

In summary there are reinforcement needs due to:

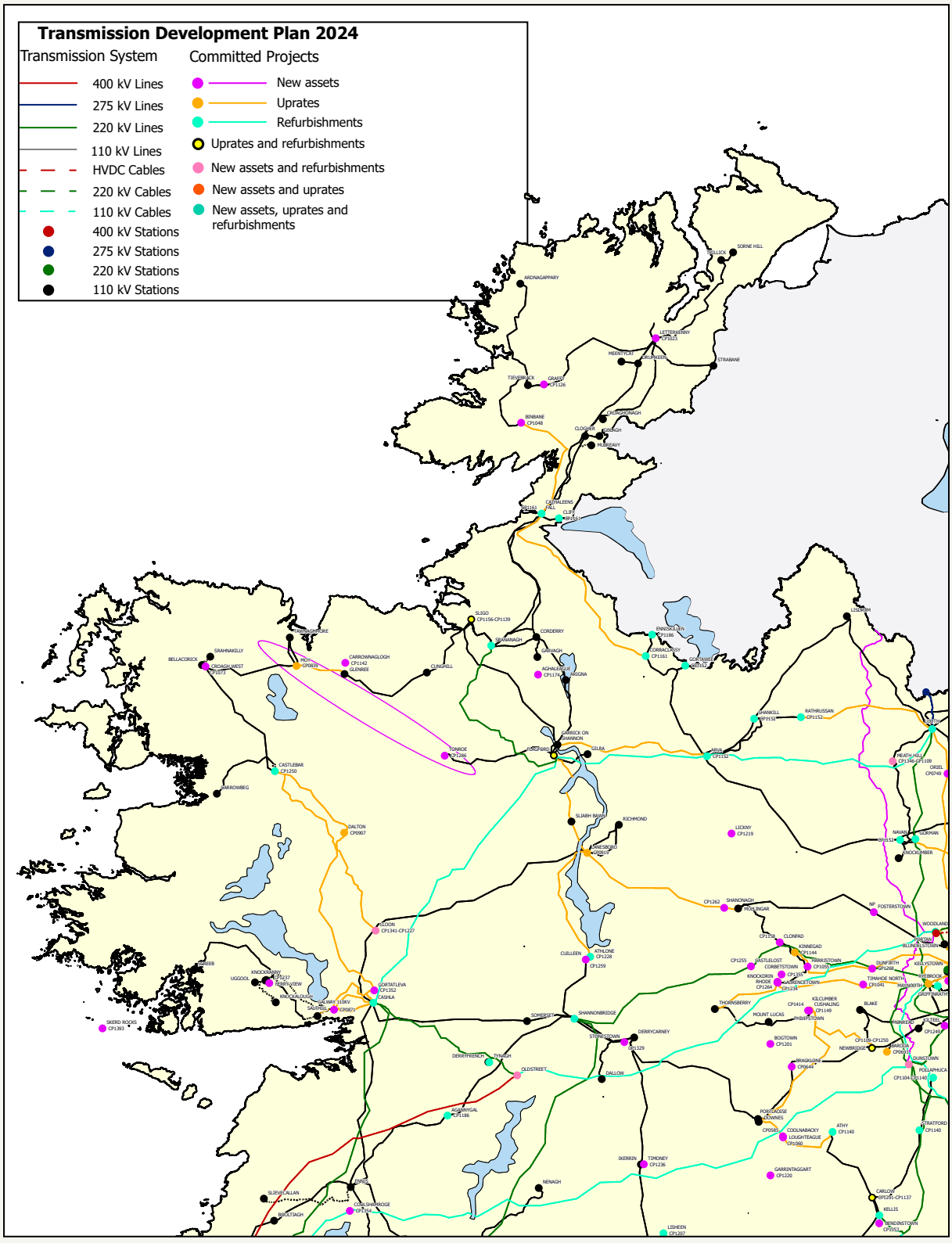
- Local constraints related to power-transfer capacity and voltage support needs.
- Asset condition.
- Further market integration with Northern Ireland.

The projects described in this section will enable the transmission network to accommodate more diverse power flows. They will also provide benefits to existing and future users of the transmission network and facilitate future regional load growth. As needs and projects progress through the six-step process, they will be included in the TDP.

The TDP contains a list of the committed projects as of 31st January 2024 and indicative completion dates are included for these projects.

The projects in the Border, Midlands and West are discussed in more detail below. Figure 5-1 shows the location of projects in Steps 4 to 6 in the Border, Midlands and West.

Figure 5-1: Planned network developments in Steps 4 to 6 in the Border, Midlands and West



Reinforcement of the transmission network between Ireland and Northern Ireland Project

North South 400 kV Interconnector – RoI (CP0466) – 400 kV Circuit from Woodland Transmission Station in Co. Meath to Turleenan Transmission Station in Northern Ireland[36].

Description

There is a requirement for increased power flow capacity between Ireland and Northern Ireland. The current capacity between both jurisdictions is limited by the existing infrastructure. There is, essentially, a risk that a single event could take the existing 275 kV interconnector out of service. This would lead to a system separation of Ireland and Northern Ireland.

The North South Interconnection Development will remove this risk of system separation and significantly increase cross-border transmission capacity. This is a joint EirGrid and SONI project.

This project addresses the following policy drivers:

RES Integration

- Facilitation of increased renewable generation via increased transfer capacity across the island.

Security of supply

- Enhanced sharing of generation capacity across the island via the SEM.
- Infrastructure capacity increase and removal of local constraints.

Market integration

- Enhanced economic efficiencies in the single market.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP0466	North South 400 kV Interconnector – RoI	New build capacity	137	Meath, Cavan, Monaghan, Armagh, Tyrone	21/09/2016	28/06/2024	30/06/2027

36 https://www.eirgrid.ie/community/projects-your-area/north-south-interconnector

Reinforcement of the transmission and distribution network in Donegal

Projects

- Letterkenny station redevelopment (CP1023).
- Power Flow Control Scheme (CP1048).
- Binbane – Cathaleen's Fall 110 kV Line Uprate (CP1079).
- Cathaleen's Fall and Connected Stations 110 kV Protection Upgrade (CP1161).
- Clogher – Drumkeen 110 kV Line Alteration (CP1282).
- Cathaleen's Fall – Coraclassy 110 kV Circuit 1 (DLR) (CP1322).

Description

Cathaleen's Fall, Cliff, Corraclassy and Gortawee 110 kV stations, require replacement of aged protection relays and teleprotection interfaces to mitigate against sub optimal protection system performance. Protection system enhancement works are also required to ensure compliance with best practice in transmission system protection. Additionally, the dynamic line rating between Cathaleen's Fall and Coraclassy is to increase transmission capacity on the circuit to facilitate the connection of renewables in the Northwest of the country. A new busbar protection scheme in Corraclassy 110 kV station and a new combined current/voltage transformer will also be installed.

The thermal uprate of Binbane – Cathaleen's Fall 110 kV circuit will support the need for power-transfer capacity arising due to new RES generation in the Northwest, as this region does not have the capacity to accommodate the expected future generation. The Letterkenny 110 kV station upgrade is essential to ensure a more secure supply of electricity for County Donegal and to enable the further integration of renewable energy in line with Government Policy targets. It will also be a key enabler in creating electricity demand opportunities in Donegal. The scope of this project involves a new 110 kV station with a busbar rating of 2,500 amperes.

These projects address the following policy drivers:

Sustainability

- Facilitating increased renewable generation via increased transfer capacity.

Security of supply

- Ensuring thermal capacities of associated circuits are not breached.
- Ensuring operation of the transmission system within security and planning standards.

Asset management

- Replacement of aging assets.
- Use of new technology to reduce constraints.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP1023	Letterkenny Station Redevelopment	New build capacity	–	Donegal	17/06/2021	10/09/2024	28/09/2029
CP1048	Power Flow Control Scheme	New build capacity	–	Longford	04/02/2021	25/11/2024	29/11/2027
CP1079	Binbane – Cathaleen's Fall 110 kV Line Uprate	Uprate/ Modify	34.3	Donegal	29/01/2021	07/06/2023	11/09/2024
CP1161	Cathaleen's Fall and Connected Stations 110 kV Protection Upgrade	Refurbish/ Replace	–	Donegal, Sligo, Cavan	04/12/2020	01/12/2021	30/11/2025
CP1282	Clogher – Drumkeen 110 kV Line Alteration	Refurbish/ Replace	–	Donegal	31/03/2023	18/10/2024	31/12/2026
CP1322	Cathaleen's Fall – Coraclassy 110 kV Circuit 1 (DLR)	Uprate/ Modify	61.1	Donegal, Leitrim, Cavan	05/04/2023	30/12/2024	28/11/2025

Reinforcement of the transmission network within and out of Mayo

Projects

- North Connacht 110 kV Project (CP0816), comprising:
  - A new Moy – Tonroe 110 kV circuit
  - Uprate of the existing Flagford – Tonroe 110 kV circuit
  - Redevelopment of the existing Tonroe 110 kV station.
- Moy 110 kV Station Reconfiguration and Busbar Uprate (CP0839).
- Castlebar – Cloon 110 kV Line Uprate (CP0848).
- Dalton 110 kV Busbar (CP0907).
- Flagford 220 kV Station Sprecher and Schuh CB Replacement (CP1031).
- Glenree – Moy 110 kV Line Uprate (CP1155).
- Cashla – Dalton 110 kV Circuit 1 (DLR) (CP1321).
- Cashla – Dalton 110 kV Thermal Capacity (CP1428).
- Castlebar – Dalton 110 kV Thermal Capacity (CP1429).

Description

The levels of generation within and on transmission corridors out of Mayo is greater than the capacity of the local 110 kV network, even when uprated. The generation contracted to connect in the area (130% increase) could result in overloads on the existing infrastructure, under both intact network and single contingency conditions.

The best performing option of the North Connaught project is currently being progressed. This involves the installation of a new circuit (Moy – Tonroe 110 kV circuit). This new circuit also serves as a shallow connection for contracted wind generation at Bellacorick 110 kV substation.

In addition to the new circuit, the existing Flagford – Tonroe 110 kV circuit will be uprated and this will further necessitate the redevelopment of the Tonroe 110 kV station.

The Castlebar – Cloon 110 kV circuit is one of the few transmission circuits in County Mayo and provides an important pathway for power supply into the area but also for transferring renewable generation out from the area to where it is needed. This uprate is planned to support the need for increased power-transfer capacity arising due to new RES generation.

New couplers will be installed in Castlebar and Moy 110 kV stations. These works will improve Security of Supply and increase operational flexibility. This is of relevance during the outage season to facilitate maintenance and construction works.

The need for a busbar uprate at Dalton 110 kV station is primarily driven by the connection of renewable generation in county Mayo. This 110 kV busbar is the limiting component of the station today as it places a restriction on the power that can flow on the two 110 kV circuits (Cashla – Dalton 110 kV and Castlebar – Dalton 110 kV) connected to it and limits generation in the area. An uprate of the busbar and increases in the thermal capacities of the connecting circuits are planned to cope with the future transfer of power through this station.

The existing Glenree – Moy 110 kV circuit is a key component in the transmission system located in county Mayo. Therefore, this circuit uprate will increase the future transfer of power through this circuit for intact network or following the loss of nearby circuits.

In addition, the projects also involve refurbishment works due to the condition of the assets, these refurbishments will be carried out at the same time as the uprating works.

These projects address the following policy drivers:

Sustainability

- Facilitating increased renewable generation via increased transfer capacity.

Security of supply

- Permit additional flexibility to carry out required operational and maintenance switching and construction.
- Facilitate bulk power transfer via increased line thermal and dynamic capacity.
- Ensure secure operation of the power system.

Asset management

- Replacement of aging assets.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP0816	North Connacht 110 kV Project	New build capacity	–	Mayo, Roscommon	12/09/2018	20/12/2023	31/03/2028
CP0839	Moy 110 kV Station reconfiguration and Busbar Uprate	Uprate/ Modify	–	Mayo	30/09/2014	07/10/2015	29/11/2024
CP0848	Castlebar-Cloon 110 kV Line Uprate-Refurb	Uprate/ Modify	57.3	Mayo, Galway	16/09/2020	20/12/2023	01/12/2025
CP0907	Dalton 110 kV Busbar	Uprate/ Modify	–	Mayo	01/10/2021	06/09/2023	24/11/2026
CP1031	Flagford 220 kV Station Sprecher & Schuh CB Replacement	Refurbish/ Replace	–	Roscommon	30/06/2018	11/07/2019	20/11/2026
CP1155	Glenree – Moy 110 kV Line Uprate	Uprate/ Modify	13.86	Sligo, Mayo	15/04/2021	20/12/2023	30/06/2025
CP1321	Cashla – Dalton 110 kV Circuit 1 (DLR)	Uprate/ Modify	60.8	Galway, Mayo	23/03/2023	20/12/2024	28/11/2025
CP1428	Cashla – Dalton 110 kV Thermal Capacity	Uprate/ Modify	60.8	Galway, Mayo			[37]
CP1429	Castlebar – Dalton 110 kV Thermal Capacity	Uprate/ Modify	27.8	Mayo			[37]

37 As of the data freeze date, the energisation date is not publicly available at this time.

New generation and battery connections in the Border, Midlands and West Projects

- Shannonbridge B, Raghra Station: tail-fed single bay 220 kV AIS station connecting to Shannonbridge 220 kV station via approx. 250m of underground cable (CP1059).
- Loughteague 110 kV Solar Farm: direct connection ('under the fence') to a designated bay of the proposed Coolnabacky 440/110 kV (CP1060).
- Croaghaun West 110 kV Station (Oweninny 3 Wind Farm): new single bay 110 kV AIS station, known as Croaghaun West 110 kV station, to be tailed into the existing Bellacorick 110 kV station (CP1073).
- Mully Graffy Windfarm: new line bay in the existing Tievebrack AIS 110 kV station connected by 6.1 km UGC to a new single bay 110 kV line/transformer bay AIS station (CP1126).
- Firlough 110 kV Station (Firlough WF): new 4 bay C-type 110 kV AIS station looping into the existing Glenree – Moy 110 kV, connected by UGC via Line Cable Interface Masts (LCIMs) (CP1142).
- Derrylahan 110 kV Station (Blackwater Bog Solar): new single bay 110 kV AIS station tailed into a new line bay at Shannonbridge 220/110 kV station via circa 3.5 km of UGC (CP1143).
- Clonfad Solar Farm: new 4 bay C-type 110 kV AIS station looping into the existing Kinnegad – Mullingar110 kV OHL, connected by OHL (CP1158)
- Aghaleague 110 kV Station: new Aghaleague 110 kV AIS single bay station to be tailed into the existing Garvagh 110 kV Station (CP1174).
- Bogtown 110 kV Station: new single bay 110 kV AIS station called Bogtown, to be connected into a new bay in Mount Lucas 110 kV Station via approximately 10 km of UGC (CP1201).
- Philipstown 110 kV Station (Cushaling Wind Farm): new AIS 110 kV 4-bay C-type station, called Philipstown, looped into the existing Cushaling – Portlaoise 110 kV OHL via 2 UGCs of approximately 1km length each (CP1217).
- Coole Windfarm: new single bay AIS station, Lickny 110 kV Station, tailed into the existing Mullingar 110 kV Station via a 26km UGC (CP1219).
- Garrintaggart 110 kV Station, Pinewoods Wind Farm: new AIS 110 kV 4-bay C-type station, called Garrintaggart, looped into the future Ballyragget – Coolnabacky 110 kV OHL via 2no. OHL's of approx. length 0.05km (CP1220).
- Knockdrin 110 kV Station (Yellow River Wind Farm): new single bay AIS station, Knockdrin 110 kV Station, tailed into the existing Derryiron 110 kV Station via approximately 0.3 km of underground cable (CP1231).
- Laurencetown 110 kV Station (Clonin North Solar Farm): new single bay AIS station, Laurencetown 110 kV station, tailed into the existing Derryiron 110 kV station via a 0.1 km of UGC (CP1234).
- Ferry View 110 kV Station (Knockranny Wind Farm): new 110 kV single bay AIS station, Ferry View, tailed into the existing Knockranny 110 kV Station via UGC of approx. length 2km (CP1237).
- Shanonagh 110 kV Station: new AIS 110 kV 4-bay C-type station looping into the existing Mullingar – Lanesboro 110 kV OHL (CP1262).

- Rhode ESS: energy storage system to be connected via the distribution network to Derryiron 100 kV station (CP1264).
- Stonestown 110 kV Station, Derrinlough Wind Farm: new 110 kV Stonestown AIS 4-bay C-type station looped into Derrycarney – Dallow T/Shannonbridge 110 kV circuit via overhead lines of approximately 0.5 km (CP1329).
- Cloon 110 kV, Barnacurragh Solar Park: 'over the fence' connection into a new 110 kV transformer bay at the existing Cloon 110 kV station in Co. Galway (CP1341).
- Gortatleva 110 kV Station (Ballymoneen Solar Park): new tailed AIS single bay 110 kV station, named Gortaleva, which will be connected via 6.6 km of underground cable to a new bay in the Cashla 220/110 kV station (CP1352).
- Corbetstown 110 kV Station (Garr Solar and Storage): a combined solar park and battery energy storage. New tailed single bay AIS 110 kV station called Corbetstown connected by an underground cable into Derryiron 110 kV station (CP1355).
- Kilcumber 110 kV Station (Cloncreen Battery Phase 2): phase 1 of the project, 75 MW wind farm, has been energised in August 2022. The connection method for the phase 2 will be via the new Kilcumber single bay AIS 110 kV tailed into the existing Cushaling 110 kV station via 2km underground cable (CP1414).

Description

These projects address the following policy drivers:

Sustainability

- Facilitating increased renewable generation via connection of energy storage systems in addition to the wind farms and solar parks.

Security of supply

- Improving competition and economic operation by removing operational constraints.
- Providing the required flexibility for increased renewable generation.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP1059	Shannonbridge B – Raghra Station	New build connection	–	Offaly	28/05/2021	12/10/2022	30/06/2025
CP1060	Loughteague 110 kV Solar Farm	New build connection	–	Laois	03/06/2020	05/11/2021	30/11/2026
CP1073	Croaghaun West 110 kV Station (Oweninny 3 Wind Farm)	New build connection	–	Mayo	02/07/2020	30/04/2024	23/04/2027
CP1126	Mully Graffy Windfarm	New build connection	–	Donegal	06/08/2020	30/04/2024	28/11/2025
CP1142	Firlough 110 kV Station (Firlough WF)	New build connection	–	Mayo	04/02/2021	30/04/2026	30/06/2027
CP1143	Derrylahan 110 kV Station (Blackwater Bog Solar)	New build connection	–	Offaly	06/05/2021	15/12/2024	28/03/2025
CP1158	Clonfad Solar	New build connection	–	Westmeath	19/01/2021	22/12/2022	31/10/2025
CP1174	Aghaleague 110 kV Station	New build connection	–	Roscommon	02/03/2022	17/03/2025	30/10/2025
CP1201	Bogtown 110 kV Station	New build connection	–	Offaly	07/10/2021	10/11/2022	13/02/2024
CP1217	Philipstown 110 kV Station (Cushaling Wind Farm)	New build connection	–	Offaly	03/02/2022	25/10/2023	[38]
CP1219	Coole Wind Farm	New build connection	–	Westmeath	01/02/2022	01/11/2024	29/08/2025
CP1220	Garrintaggart 110 kV Station (Pinewoods Wind Farm)	New build connection	–	Laois	01/02/2022	12/01/2024	29/08/2025
CP1231	Knockdrin 110 kV Station (Yellow River Wind Farm)	New build connection	–	Offaly	07/04/2022	05/09/2023	15/09/2025
CP1234	Laurencetown 110 kV Station (Clonin North Solar Farm)	New build connection	–	Offaly	07/04/2022	16/10/2023	17/11/2025
CP1237	Ferry View 110 kV Station (Knockranny Wind Farm)	New build connection	–	Galway	07/07/2022	01/01/2024	[38]
CP1262	Shanonagh 110kV Station	New build connection	–	Westmeath	10/11/2022	26/07/2024	31/10/2025
CP1264	Rhode ESS	New build connection	–	Offaly	23/06/2022	01/09/2023	26/06/2026

38 As of the data freeze date, the energisation date is not publicly available at this time.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP1329	Stonestown 110 kV Station (Derrinlough Wind Farm)	New build connection	–	Offaly	28/11/2022	02/10/2023	19/08/2024
CP1341	Cloon 110 kV (Barnacurragh Solar Park)	New build connection	–	Galway	04/04/2023	29/07/2024	28/04/2027
CP1352	Gortatleva 110 kV Station (Ballymoneen Solar Park)	New build connection	–	Galway	09/04/2023	29/07/2024	28/04/2027
CP1355	Corbetstown 110 kV Station (Garr Solar and Storage)	New build connection	–	Offaly	23/08/2023	31/03/2025	31/12/2027
CP1414	Kilcumber 110 kV Station (Cloncreen Battery Phase 2)	New build connection	–	Offaly	06/09/2023	13/03/2024	[39]

39 As of the data freeze date, the energisation date is not publicly available at this time.

Reinforcement of the transmission and distribution networks in the Border, Midlands and West

Projects

- Bracklone 110 kV Station, DSO: new DSO demand connection (CP0644).
- Flagford – Sliabh Bawn 110 kV Circuit Uprate (CP0817).
- Flagford – Louth 220 kV Line Refurbishment (CP0867).
- Louth – Ratrussan 110 kV No. 1 Line Uprate (CP0905).
- Lanesboro – Mullingar 110 kV Thermal Uprate (CP1000).
- Cushaling – Portlaoise 110 kV Line Uprate (CP1003).
- Lanesboro – Sliabh Bawn 110 kV Line Uprate (CP1078).
- Cashla – Flagford 220 kV Line Refurbishment (CP1119).
- Tonroe 110 kV Station DSO (CP1286).
- Athlone – Lanesboro 110 kV Line Uprate (CP1311).

Description

The DSO has requested the connection of a new 110 kV station close to Portarlington in Co. Laois. The Tonroe 110 kV station is also being developed due to local capacity issues in Ballaghaderreen area. The Ballaghadereen 38 kV Station is operating above planning capacity, coupled with difficulty in offloading the station for maintenance purpose. This is a security of supply issue due to increased demand in the area.

A Line Condition Assessment (LCA) and a Line Project Assessment Report (LPAR) have confirmed that Cashla – Flagford 220 kV needs to be refurbished.

The main elements of refurbishment include tower painting, insulator and hardware replacement.

The continued operation of Cashla – Flagford 220 kV is essential for the system security and it is believed that this refurbishment should be carried out as per the scope of the LPAR to extend the assets life by 20 years.

The existing Flagford – Sliabh Bawn 110 kV, Lanesboro – Mullingar 110 kV and Lanesboro – Sliabh Bawn 110 kV circuits form part of the transmission network in the Northwest area which does not have the capacity to accommodate the expected future generation and therefore forms part of a heavily used and important area of the network. Thermal uprates of these circuits are planned to support the need for power-transfer capacity arising due to new RES generation.

The Flagford – Louth 220 kV line was de-rated in 2016 due to 12 ground infringements. To return the line to normal operating limits, there is a requirement to replace 12 existing towers with 12 new ones. Louth – Ratrussan 110 kV needs refurbishment works was identified in a Line Project Assessment Report. Additionally, a full circuit uprate is required to ensure the continued safe, secure and reliable operation of this asset.

In the midlands, the Cushaling – Portlaoise 110 kV and Athlone – Lanesboro 110 kV circuits are also at increased risks of large power flows. The addition of more renewable generation in the region thus necessitates the uprate of these circuits to evacuate the additional renewable generation.

These projects address the following policy drivers:

Sustainability

- Facilitating increased renewable generation via increased transfer capacity.

Security of supply

- Improve operational flexibility by allowing for outage planning.
- Facilitate bulk power transfer via increased line thermal capacity.
- Ensure the continued, secure and reliable operation of the transmission network.

Asset management

- Replacement of aging assets.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP0644	Bracklone 110 kV Station – DSO	New build connection	–	Laois	19/03/2020	01/06/2022	01/06/2026
CP0817	Flagford – Sliabh Bawn 110 kV Circuit Uprate	Uprate/ Modify	21.2	Roscommon	18/02/2021	02/06/2022	03/11/2025
CP0867	Flagford – Louth 220 kV Line Refurbishment	Refurbish/ Replace	110	Roscommon, Leitrim, Longford, Cavan, Meath, Louth	20/04/2015	30/04/2020	30/11/2025
CP0905	Louth – Rathrussan 110 kV No 1 Line Uprate	Uprate/ Modify	39	Louth, Monaghan, Cavan	25/05/2016	29/08/2022	30/09/2025
CP1000	Lanesboro – Mullingar 110 kV Thermal Uprate	Uprate/ Modify	46	Longford, Westmeath	29/01/2021	10/09/2024	30/11/2025
CP1003	Cushaling – Portlaoise 110 kV Line Uprate	Uprate/ Modify	41.7	Portlaoise, Offaly	05/07/2023	05/12/2025	30/11/2029
CP1078	Lanesboro – Sliabh Bawn 110 kV Line Uprate	Uprate/ Modify	9.4	Longford, Roscommon	18/02/2021	14/02/2024	30/11/2025
CP1119	Cashla Flagford 220 kV Line Refurbishment	Refurbish/ Replace	88	Galway, Roscommon	26/02/2021	21/03/2024	18/12/2025
CP1286	Tonroe 110kV Station DSO	New build capacity	–	Roscommon	11/08/2023	30/04/2024	23/09/2025
CP1311	Athlone – Lanesboro 110 kV Line Uprate	Uprate/ Modify	35.8	Longford, Roscommon	16/02/2023	30/09/2025	30/11/2029

Reinforcement and upgrade of the transmission network in Galway

Projects

- Galway 110 kV Station Redevelopment Project (CP0871).
- Cashla 220 kV Station Sprecher and Schuh CB Replacement (CP1032).
- Oldstreet, Tynagh and Cashla 400 kV and 220 kV Protection Upgrade (CP1153).
- Cashla – Salthill 110 kV Thermal Uprate (CP1168).
- Cashla – Galway 110 kV Circuit 1 Line Uprate (CP1191).
- Cashla – Galway 110 kV Circuit 2 Uprating (CP1275).
- Cashla – Galway 110 kV Circuit 3 Uprating (CP1276).

Description

Aged protection relays and teleprotection interfaces in Oldstreet 400 kV station and Cashla and Tynagh 220 kV stations must be replaced. This involves an installation of dedicated auto-reclose supervision relays on both ends of Cashla – Tynagh 220 kV circuit. This is part of a new standard approach in auto-reclose supervision when overhead lines are combined with cabled sections.

A significant amount of new renewable generation has been connected or is in the process of being connected to the transmission and distribution system along the west coast in Connacht and specifically around the Galway area. This power needs to be transported to regions of high demand such as in the east of the country.

Galway 110 kV station needs to be redeveloped to cater for power flows greater than the rating of the busbar which are driven by the connection of new generation in the area. A needs assessment of the transmission network in the Galway area confirmed that increased thermal capacity between Cashla and Galway stations is required to cater for an unplanned loss (single contingency) of one of the Cashla – Galway 110 kV circuits. The solution for the area is to uprate Cashla – Galway 110 kV circuits 1, 2 and 3 and Cashla – Salthill 110 kV circuit.

These projects address the following policy drivers:

Sustainability

- Facilitating increased renewable generation via increased transfer capacity.

Security of supply

- Facilitate bulk power transfer via increased line thermal capacity.

Asset management

- Redevelopment of station and replacement of ageing protection assets.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP0871	Galway 110 kV Station Redevelopment Project	Uprate/ Modify	–	Galway	21/06/2017	21/12/2018	30/11/2024
CP1032	Cashla 220 kV Station Sprecher & Schuh CB Replacement	Refurbish/ Replace	–	Galway	30/06/2018	11/07/2019	30/11/2026
CP1153	Oldstreet Tynagh & Cashla 400 kV and 220 kV Protection Upgrade	Refurbish/ Replace	–	Galway	12/11/2020	05/08/2021	30/11/2025
CP1168	Cashla-Salthill 110 kV Thermal Uprate	Uprate/ Modify	9.4	Galway	18/03/2021	05/06/2024	30/11/2025
CP1191	Cashla-Galway 110 kV Circuit 1 Line Uprate	Uprate/ Modify	13.8	Galway	21/11/2022	30/12/2025	30/11/2029
CP1275	Cashla-Galway 110 kV Circuit 2 Uprating	Uprate/ Modify	11.3	Galway	21/11/2022	30/12/2025	31/12/2029
CP1276	Cashla-Galway 110 kV Circuit 3 Uprating	Uprate/ Modify	11.3	Galway	21/11/2022	30/12/2025	31/12/2029

Offshore project in Galway

Project

Offshore Phase 1 Project 1 (Skerd Rocks) (CP1393).

Description

Skerd Rocks Wind Farm is an offshore wind farm located off the coast of County Galway and is one of the six projects included in Phase 1 of the Offshore Delivery Programme.

The method of connection will be a new 220 kV Carrowdotia GIS tailed to existing bay at Moneypoint 220 kV station via 2.3km of underground cable.

In addition, the offshore wind array will be connected to the Transmission Asset Owner interface at Carrowdotia 220 kV station via 76km undersea cable and 23km underground cable.

This project addresses the following policy driver:

Sustainability

- Facilitating increased offshore renewable generation.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP1393	Offshore Phase 1 Project 1	New build connection	–	Galway	15/12/2022	31/12/2024	30/06/2027

Reinforcement of the transmission network in Cavan

Projects

- Arva – Carrick-on-Shannon 110 kV line Uprate (CP0841).
- Arva and Connected Stations 110 kV Protection Upgrade (CP1152).

Description

Arva, Gortawee, Navan, Ratrussan and Shankill 110 kV stations require replacement of aged protection relays and teleprotection interfaces to mitigate against suboptimal protection system performance. Protection system enhancement works are also required to ensure compliance with best practice in transmission system protection. Installation of a new busbar protection scheme in Gortawee station and the installation of new combined Current/Voltage transformers (CT/VT), on Shankill transformers, are also included in this project.

A study carried out in early 2019 to identify thermal constraints confirmed the need to uprate Arva – Carrick-on-Shannon 110 kV circuit. This project is part of a suite of uprates being progressed in the Northwest to aid in the delivery of future renewable generation and alleviate some of the constraints on existing connected generation. The uprate of the Arva – Carrick-on-Shannon 110 kV circuit is expected to release an important amount of Firm Access Quantity (FAQ) when completed.

These projects address the following policy drivers:

Security of supply

- Facilitate power transfer via increased line thermal capacity.

Asset management

- Replacement of ageing protection assets.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP0841	Arva – Carrick-on-Shannon 110 kV Line Uprate	Uprate/ Modify	43	Cavan, Longford, Leitrim, Roscommon	21/05/2020	15/12/2021	30/11/2025
CP1152	Arva and Connected Stations 110 kV Protection Upgrade	Refurbish/ Replace	–	Cavan	12/11/2020	01/09/2021	12/12/2025

Reinforcement of the transmission network in Sligo

Projects

- Sligo and Srananagh 220 and 110 kV Protection upgrade (CP1139).
- Sligo 110 kV Station – Srananagh 1 and 2 Bay Uprates (CP1156).

Description

This project involves replacement of aged protection relays and teleprotection interfaces in Sligo 110 kV and Srananagh 220 kV stations to mitigate against suboptimal protection system performance.

The Sligo – Srananagh 1 & 2 110 kV circuits are currently limited by the bay conductors on the Srananagh 1 & 2 110 kV at Sligo 110 kV substation. It has been determined that the best solution to overcome this limitation is to progress with an uprate of these bays at Sligo 110 kV station. Overcoming this limitation will help to accommodate the expected future generation in the area and maintain compliance with the Transmission System Security and Planning Standards (TSSPS).

These projects address the following policy drivers:

Security of supply

- Facilitate power transfer via increased line thermal capacity.

Asset management

- Replacement of ageing protection assets.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP1139	Sligo & Srananagh 220 & 110 kV Protection Upgrade	Refurbish/ Replace	–	Sligo	01/10/2020	16/07/2021	30/11/2025
CP1156	Sligo 110 kV Station – Srananagh 1 & 2 Bay Uprates	Uprate/ Modify	–	Sligo	18/06/2021	04/04/2022	30/11/2025

Reinforcement of the transmission network in Offaly

Projects

- Derryiron – Thornsberry 110 kV Line Uprate (CP1199).
- Derryiron Busbar Uprate (CP1232).
- Derryiron Temporary Bypass Project (CP1272).

Description

Planning studies indicate that the connection of new generation and the building of new infrastructure will increase the power flow through the Offaly area. The Derryiron – Thornsberry 110 kV circuit is expected to accommodate a considerable amount of power flow, in times of future high wind power or in the event of unforeseen loss of the 110 kV Cushaling – Mount Lucas circuit. An uprate of the Derryiron – Thornsberry circuit was identified as the best performing option to solve the identified need. Derryiron busbar uprate is also driven by Sustainability. An increase in power transfer through the 110 kV busbar at the Derryiron station is expected due to some planned connections to this station that are driving the need for this project. The project involves a busbar uprate and extension to the busbar at Derryiron and installing a sectionaliser circuit breaker.

The temporary bypass at Derryiron 110 kV station is required to reduce the impact of severe outages at Derryiron to keep critical circuits in operation during the planned works to uprate and extend the existing busbar of this station. The arrangement consists in a bypass that will work by temporarily tying the Rhode and Kinnegad circuits together so that they can electrically feed each other while disconnected from the Derryiron busbar. The connection, known as flyover, will consist of a conductor spanning the length of the busbar, supported by two steel-frame structures (approx. 11.7m tall) at each end and one intermediate wooden pole. Both circuits will be connected to this temporary flyover conductor and disconnected from the existing busbar.
The arrangement will be a pre-requisite for the connection of 3 customer renewable projects (CP1234, CP1231 and CP1236) and a station upgrade project (CP1232). Project drivers are summarised below:

Sustainability

- Facilitating increased renewable generation via increased transfer capacity.

Security of supply

- Facilitate regional power transfer via increased line thermal capacity.
- Safeguard power system operation in the event of loss of other connecting circuit(s).
- Reduce impact of severe outages to keep critical circuits in operation.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP1199	Derryiron – Thornsberry 110 kV Line Uprate	Uprate/ Modify	19.7	Offaly	19/11/2021	20/12/2023	25/10/2027
CP1232	Derryiron 110 kV Busbar Uprate	Uprate/ Modify	–	Offaly	29/04/2022	05/07/2023	31/12/2025
CP1272	Derryiron Temporary Bypass Project	Uprate/ Modify	–	Offaly	12/10/2022	28/07/2023	29/03/2024

Reinforcement of the transmission network in Laois

Project

- Coolnabacky – Portlaoise 110 kV Line Uprate (CP0835).
- Newbridge – Portlaoise 110 kV Line Uprate (CP1170).

Description

The Coolnabacky – Portlaoise 110 kV Line Uprate is related to the Laois – Kilkenny Reinforcement Project (CP0585) which is required to address quality of supply and provide operational security in the area. Note that CP0585 is further described in the Southeast, Mideast and Dublin section below.

The need for reinforcement is driven by increased renewable generation in the region. Studies have indicated overloading for an intact network, single contingency and maintenance trip conditions. Furthermore, refurbishment works due to the condition of the circuit will be undertaken at the same time as the uprating works.

The Newbridge – Portlaoise 110 kV Line Partial Thermal Uprate, is driven by an expected increase in the level of demand in the East and significant levels of new renewable generation connection in the Southwest and Midlands. The Bracklone – Portlaoise and Bracklone – Newbridge 110 kV circuits will be created following completion of a separate capital project (CP0644) to loop the planned new Bracklone 110 kV DSO station into the existing Newbridge – Portlaoise 110 kV circuit. These circuits form an important part of the transmission network in the Midlands supplying local transmission stations, facilitating cross country power flows from the West to the East and facilitating the connection of renewable generation in the Midlands.

These projects address the following policy drivers:

Sustainability

- Facilitating increased renewable generation via increased transfer capacity.

Security of supply

- Facilitate increased demand connection via increased line thermal capacity.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP0835	Coolnabacky – Portlaoise 110 kV Line Uprate	Uprate/ Modify	8	Kildare, Laois	30/05/2018	26/09/2024	01/12/2025
CP1170	Newbridge – Portlaoise 110 kV Line Uprate	Uprate/ Modify	21.8	Newbridge, Portlaoise	05/08/2021	22/02/2024	26/02/2026

Reinforcement of the transmission network in Longford

Project

Lanesboro 110 kV Station Redevelopment Project (CP0919).

Description

The need for this project is due to a shortage of transmission capacity. Lanesboro 110 kV station needs to be redeveloped to cater for increased power flows greater than the rating of the existing busbar due to the planned connection of new generation.

The redevelopment of Lanesboro 110 kV station will also improve security of supply and increase operational flexibility as it will allow existing restrictions in outage planning to be removed.

These projects address the following policy drivers:

Security of supply

- Improve operational flexibility by allowing for outage planning.
- Facilitate inter-regional power transfer by increasing transmission capacity.

Asset management

- Station redevelopment and introduction of new assets.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP0919	Lanesboro 110 kV Station Redevelopment Project	Uprate/ Modify	–	Longford	28/12/2017	30/06/2020	30/11/2029

New OCGT generation connections in Border, Midlands and West Projects

- Castlelost FlexGen (CP1255).
- Cuilleen Power (CP1259).

Description

The drivers for these projects are Security of supply.

Castlelost FlexGen is a 275 MW generation facility at Rochfortbridge, Co. Westmeath which will be 5 x 55 MW OCGT units connecting via a new 4 Bay C-Type 220 kV GIS Station looped into the Maynooth – Shannonbridge 220 kV circuit.

Cuilleen Power is a 100 MW generation facility at Monksland, Athlone, Co. Roscommon which will be gas fired reciprocating engines connecting via a new single bay 110 kV AIS Station tailed to Athlone 110 kV Station via 1.5km of UGC.

This project addresses the following policy driver:

Security of supply

- Ensure capacity adequacy to meet peak demand.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP1255	Castlelost FlexGen	New build connection	–	Westmeath	04/05/2022	28/08/2023	10/04/2025
CP1259	Cuilleen Power	New build connection	–	Roscommon	05/05/2022	20/03/2024	23/11/2025

5.3 The Southwest and Midwest

Summary of projects

Project category	No. of projects
New build	15
Uprate/Modify	9
Refurbish/Replace	16
Total	**40**

Active TDP projects by region

The Southwest and Midwest regions have a wide variety of generation sources dispersed around the region. These include wind, storage, hydro, gas, fuel oil, diesel and coal power stations. The existing transmission network is composed of 110 kV, 220 kV and 400 kV infrastructure. The high capacity 220 kV and 400 kV circuits facilitate high inter-regional power flows from the region.

The development of the transmission network in the area is characterised by the connection of high levels of wind generation in Co. Cork and Co. Kerry. These high levels of generation result in transmission network constraints as power is exported out of the area towards the Moneypoint and Knockraha transmission stations.

Generation levels in the area are set to increase in the coming years. In recent years, uprating of 220 kV circuits in the Southwest has been completed which is reducing constraints in this area.

The level of generation is greater than the capacity of the network resulting in local constraints related to power-transfer needs. These large transfers of power create voltage support needs. To solve these voltage support needs and enable the efficient export of generation from the area network reinforcement is required.

Furthermore, EirGrid is currently working on a joint project with the French TSO Réseau de Transport d'Électricité (RTE) called the Celtic Interconnector, which would land on the southern coast of Ireland with a connection point in Cork. This interconnector is deemed a Project of Common Interest (PCI) by the European Commission. PCIs are intended to help the EU achieve its energy policy and climate objectives: affordable, secure and sustainable energy for all citizens. See Appendix A Irish Projects in European Plans for more information.

In summary, there are reinforcement needs due to:

- Local constraints related to power-transfer capacity and voltage support needs.
- Facilitate the usage and transfer of renewable energy across the Island.
- Asset condition.

The projects described in this section will enable the transmission network to accommodate more diverse power flows. They will also provide benefits to existing and future users of the transmission network and facilitate future regional load growth.

We will continue to assess reinforcement needs in the Southwest and Midwest and to identify solutions as part of the assessment for the future network in EirGrid's strategy documents, aiming to find new projects required in the area beyond those already progressing through the grid development process.

The TDP contains a list of the committed projects as of 31 January 2024 and indicative completion dates are included for these projects.

The projects in the Southwest and Midwest are discussed in more detail below.

Figure 5-2 (a): Planned network developments in Steps 4 to 6 in the Southwest and Midwest

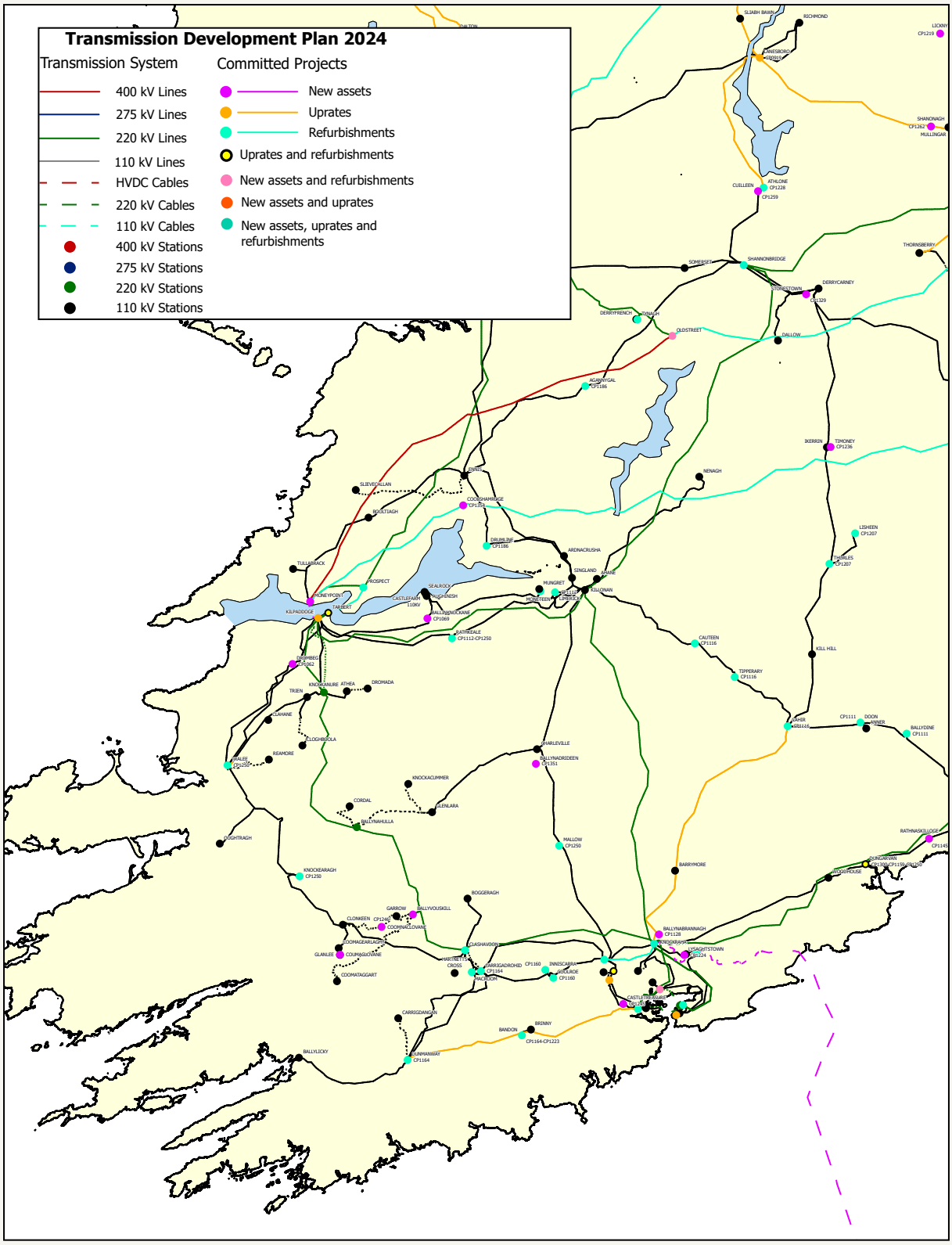
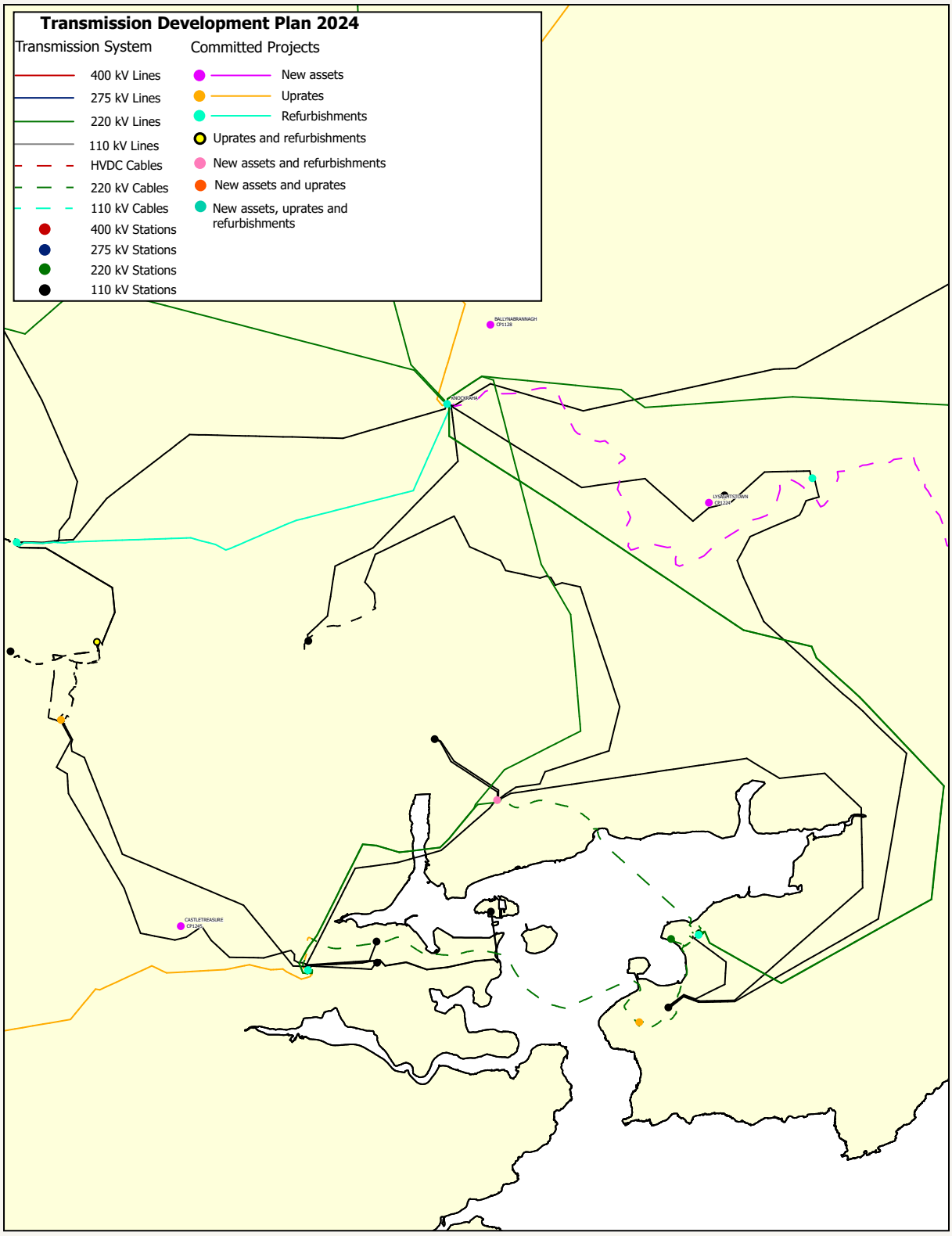


Figure 5-2 (b): Planned network developments in Steps 4 to 6 in Cork



Reinforcement of the transmission network in Kerry

Projects

- Tarbert 220 kV Station Upgrade (CP0622).
- Prospect Tarbert 220 kV Cable Replacement Project (CP0917).
- Glencloosagh Phase 1 – Rotating Stabiliser (CP1173).
- Glansillagh 220 kV Station (CP1297).

Description

The need for reinforcement arises due to local constraints on the transmission network. The existing Tarbert transmission station is being retained. However, due to the age and condition of the assets in Tarbert station, a project involving the refurbishment of the 220 kV assets is progressing.

Glencloosagh Phase 1 – Rotating stabiliser project is driven by security of supply to allow a customer connection of 8 MVA stabiliser to the transmission system in Co. Kerry. The method of connection will be a new single bay 220 kV AIS station at the Customer's Facility with a tailed connection into Kilpaddoge 220/110 kV Station via UGC.

Prospect – Tarbert 220 kV circuit is partially an overhead line and partially an underground/submarine cable. The cable has now reached end-of-life and requires replacement in the short term. The need to replace the existing Prospect – Tarbert Fluid Filled 220 kV Cable is due to asset condition and age. It is also a requirement of EirGrid's cable maintenance policy to replace all Fluid Filled Cables on the system to remove the environmental risk of leaks.

Glansillagh 220 kV station is a security of supply project that will connect generation that received a capacity contract in the T-4 2026/27 capacity auction, run by SEMO.

A summary of these projects' drivers is given below:

Security of supply

- Maintain efficient operation of the transmission system by addressing local constraints.
- Allow for future expansion of customer demand.

Asset management

- Replacement of ageing assets.
- Reduction of environmental impact.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP0622	Tarbert 220 kV Station Upgrade	Refurbish/ Replace	–	Kerry	29/05/2012	16/12/2014	[40]
CP0917	Prospect Tarbert 220 kV Cable Replacement Project	Refurbish/ Replace	2.48	Kerry	16/06/2021	31/03/2024	28/11/2025
CP1173	Glencloosagh Phase 1 – Rotating Stabiliser	Uprate/ Modify	–	Kerry	06/05/2021	30/06/2024	30/07/2025
CP1297	Glansillagh 220kV Station	New build connection	–	Kerry	08/06/2023	22/05/2025	01/11/2028

40 As of the data freeze date, the energisation date is not publicly available at this time.

Reinforcement of the transmission network in Tipperary

Projects

- Ballydine, Cahir and Connected Stations 110 kV Protection Upgrade (CP1111).
- Tipperary, Cahir and Connected Stations 110 kV Protection Upgrade (CP1116).
- Lisheen – Thurles 110 kV Protection Upgrade (CP1207).

Description

The three projects involve replacement of aged protection relays and teleprotection interfaces in Cahir, Ballydine and Doon 110 kV stations (CP1111), Cahir, Cauteen and Tipperary 110 kV stations (CP1116) and in Lisheen and Thurles 110 kV stations (CP1207).

At the Ballydine and Doon 110 kV stations, the installation of a bus zone protection system and the extension of the buildings is planned to make room for the new protection relay panels.

Installation of a new combined Current transformer/Voltage transformer (CT/VT) in Tipperary 110 kV station is the only significant deviation from relay installation and commissioning type work contained in CP1116.

Installation of new duplicate protection relays are included for both Lisheen and Thurles 110 kV stations. This is a particularly vulnerable circuit as there is no redundancy in the protection systems and one end has an end-of-life device. Failure of a single protection element at either end of this line will result in the circuit being forced out of service until urgent repair or replacement can be completed.

These projects address the following policy drivers:

Security of supply

- Maintain efficient operation of the transmission system according to security and planning standards.

Asset management

- Replacement of ageing protection assets.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP1111	Ballydine, Cahir and Connected Stations 110 kV Protection Upgrade	Refurbish/ Replace	–	Tipperary	21/05/2020	18/07/2021	30/11/2025
CP1116	Tipperary, Cahir and Connected Stations 110 kV Protection Upgrade	Refurbish/ Replace	–	Tipperary	13/05/2020	14/07/2021	30/11/2025
CP1207	Lisheen – Thurles 110 kV Protection Upgrade	Refurbish/ Replace	–	Tipperary	04/11/2021	25/10/2022	30/07/2025

Reinforcement of the transmission network between Tipperary and Cork

Project

Barrymore – Cahir – Knockraha 110 kV Line Uprate (CP1320).

Description

With the planned development of two new interconnectors in the south of Ireland as well as increased connection of renewable energy in the region, the Barrymore – Cahir – Knockraha 110 kV circuit requires uprating to increase its capacity.

This project addresses the following policy drivers:

Sustainability

- Facilitating increased renewable energy usage via increased transfer capacity.

Security of supply

- Facilitate bulk power transfer via increased line thermal capacity.
- Ensure secure operation of the power system.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP1320	Barrymore Cahir Knockraha 110kV Line Uprate	Uprate/ Modify	63.5	Cork, Tipperary	31/07/2022	30/12/2024	01/11/2028

Reinforcement of the transmission network in West Cork

Projects

- Coolroe, Inniscarra and Connected Stations Protection Upgrade (CP1160).
- West Cork 110 kV Protection Upgrade (CP1164).
- Brown Boveri Circuit Breaker Replacements (CP1209).
- Bandon Dunmanway 110 kV Circuit Thermal Capacity (CP1211).
- Bandon Raffeen 110 kV Circuit Thermal Capacity (CP1212).
- Bandon 110 kV Busbar Rating Needs (CP1223).
- New Ballyvouskill 220/110 kV Transformer (CP1247).

Description

The Coolroe, Inniscarra and Macroom and West Cork Protection Upgrades involve replacement of aged protection relays and teleprotection interfaces to mitigate against sub optimal protection system performance and the need for the grid to have its assets in a good condition. The existing fibre optic network between Macroom and Inniscarra is planned to be utilised for differential protection and teleprotection. Installation of a new 110 kV busbar protection schemes in Inniscarra and Coolroe 110 kV stations are included in this project.

West Cork Protection upgrade also includes the installation of a new busbar protection scheme in Carrigadrohid station. Building extension works has also been included for Carrigadrohid as new protection cabinet may require more space than is available in the existing control room.

Due to the integration of significant levels of new renewable generation to the transmission and distribution system in the Southwest and integration of interconnectors, an increase in power flow is expected through Bandon – Dunmanway 110 kV and Bandon – Raffeen 110 kV circuits. These thermal uprates are necessary because in times of high wind power dispatches in the future, an unplanned loss of the Clashavoon – Knockraha 220 kV circuit could result in excessive power flows on the circuits Bandon – Dunmanway 110 kV and Bandon – Raffeen 110 kV exceeding their thermal rating, putting local security of supply for West Cork at risk. There is also the identified issue of thermal capacity of the Bandon 110 kV busbar which limits the amount of renewable generation in the area and must be addressed by an uprate of the busbar.

Brown Boveri circuit breaker replacements project includes changes of circuit breakers in Aghada, Louth, Moneteen, Prospect and Raffeen stations. The circuit breakers are approximately 40 years old and while they have not reached their expected lifespan, replacement is planned based on poor reliability, high refurbishment costs and the criticality of the assets. This project will also include the replacement and refurbishment of other equipment associated with each bay to ensure reliable performance of these critical assets for the future.

The need for the new Ballyvouskill 220/110 kV Transformer project is primarily driven by the planned connection of the RES. The transformers at Ballyvouskill station are at risk of overloading, as it has been identified that one will be overloaded beyond its emergency thermal rating for the loss of the other, during times of high generation in the Southwest. The installation of a third 220/110 kV transformer at Ballyvouskill station will address the issue described above, ensuring security of supply and allowing the connection of renewables sources in the area.

These projects' drivers are summarised below:

Sustainability

- Facilitating increased renewable energy connection via increased transfer capacity.
- Enable optimal renewable energy usage during periods of high wind power dispatches.

Security of supply

- Facilitate bulk power transfer via increased line thermal capacity.
- Ensure integration of interconnection and enhanced power transfer.

Asset management

- Replacement of ageing protection assets.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP1160	Coolroe, Inniscarra & Connected Stations Protection Upgrade	Refurbish/ Replace	–	Cork	04/12/2020	04/11/2021	30/11/2024
CP1164	West Cork 110 kV Protection Upgrade	Refurbish/ Replace	–	Cork	04/02/2021	03/02/2022	30/11/2025
CP1209	Brown Boveri Circuit Breaker Replacements	Refurbish/ Replace	–	Cork, Clare, Limerick	31/03/2022	20/12/2023	01/12/2028
CP1211	Bandon Dunmanway 110 kV Circuit Thermal Capacity	Uprate/ Modify	25.9	Cork	21/01/2022	30/09/2024	27/11/2026
CP1212	Bandon Raffeen 110 kV Circuit Thermal Capacity	Uprate/ Modify	27.2	Cork	28/01/2022	31/12/2024	31/12/2027
CP1223	Bandon 110 kV Busbar Rating Needs	Refurbish/ Replace	–	Cork	03/05/2023	30/06/2025	03/12/2029
CP1247	New Ballyvouskill 220-110 kV Transformer	New build capacity	–	Cork	10/05/2022	28/08/2023	01/12/2025

Reinforcement of the transmission network in the Cork City area

Projects

- Trabeg 110 kV Station: uprate 2 x 110 kV transformer bays and control room extension, DSO (CP0741).
- Knockraha Station and Installation of Additional Couplers (CP0796).
- Kilbarry – Knockraha 110 kV No.2 Line Refurbishment (CP0901).
- Kilbarry 110 kV GIS Station (CP0949).

  Knockraha Short Circuit Rating Mitigation (CP0973).
- Cow Cross New 110 kV Transformer (CP1132).
- Knockraha 220 kV Transformer Replacement (CP1222).
- Knockraha 220 kV Transformer Replacement – T2102 (CP1412).

Description

The driver for these projects is Security of Supply. Together they will create and maintain the requisite levels of reliability and flexibility in the transmission network.

The need for the Knockraha 220/110 kV station upgrade project arises due to several local constraints on the transmission network. Studies have indicated the potential unacceptable loss of generation and voltage violations without this project.

Trabeg 110 kV station project considers an uprate of 2 x 110 kV AIS load transformers to accommodate an increased distribution demand in the area.

Knockraha Short Circuit Rating Mitigation project addresses safety and security of supply. It will strengthen the capability of the support structures for strung busbar and bay conductor equipment to withstand the mechanical forces created by higher short circuit currents flowing through busbar and bay conductor.

The installation of a new distribution transformer at Cow Cross 110 kV is required to facilitate the additional load driven by the retirement of the Cobh 38 kV Station and to facilitate new demand connections. Similarly, a new 110 kV station near Kilbarry is being progressed to accommodate increased demand in the area and to improve security of supply for Cork city and the vicinity of North Cork.

The proposed refurbishment of the Kilbarry – Knockraha 110 kV focusses on operational and maintenance issues for existing equipment. The refurbishment works include replacement of insulators and hardware, reinforcement of shear blocks, replacement of wooden pole sets, corrosion treatment of steel towers and ancillary site works.

The Knockraha 220 kV substation is the connection point for the Celtic Interconnector and the large load centre of Cork city. Additionally, the station is a critical transit point for the large amounts of renewable energy generated in West Cork and Kerry to the rest of the country. The current ages of the two existing transformers are 49 and 48 years and are near their 50-year expected life span. CP1222 and CP1412 will replace the two transformers with new modern transformers. This replacement is to improve asset resilience at this critical 220 kV transmission station.

These projects address the following policy drivers:

Sustainability

- Facilitating increased renewable energy connection via increased transfer capacity.
- Enable optimal renewable energy usage during periods of high wind power dispatches.

Security of supply

- Accommodate increasing demand connections in the area.
- Ensure safe, secure and reliable operation of the transmission system.

Asset management

- Replacement of ageing protection equipment.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP0741	Trabeg 110 kV Station – uprate 2 x 110 kV transformer bays and control room extension DSO	Uprate/ Modify	–	Cork	03/06/2020	29/04/2021	01/05/2025
CP0796	Knockraha Station and Installation of Additional Couplers	Uprate/ Modify	–	Cork	21/09/2016	30/09/2016	30/11/2025
CP0901	Kilbarry – Knockraha 110 kV No 2 Line Refurbishment	Refurbish/ Replace	12.5	Cork, Cork	13/05/2020	03/10/2022	10/11/2025
CP0949	Kilbarry 110 kV GIS Station	New build connection	–	Cork	14/02/2017	04/03/2021	10/11/2025
CP0973	Knockraha Short Circuit Rating Mitigation	Uprate/ Modify	–	Cork	03/11/2016	21/06/2019	03/11/2025
CP1132	Cow Cross New 110 kV Transformer	New build capacity	–	Cork	02/09/2020	07/10/2021	26/06/2024
CP1222	Knockraha 220 kV Transformer Replacement	Refurbish/ Replace	–	Cork	19/01/2022	15/12/2022	10/10/2025
CP1412	Knockraha 220 kV Transformer Replacement (T2102)	Refurbish/ Replace	–	Cork	08/03/2023	05/09/2024	05/11/2027

Interconnection of the transmission network between Ireland and France

Project

- Knockraha Station Celtic IC Non-contested Works (CP1215).

Description

As part of the preparation of the connection of the Celtic Interconnector, works will be carried out at Knockraha station. The Celtic Interconnector is a planned subsea HVDC link to allow the exchange of electricity between Ireland and France. Since 2011, EirGrid has been working with its French equivalent Réseau de Transport d'Electricité (RTE) to find the best way to develop the interconnector to benefit electricity customers and markets in Ireland, France and the EU.

The scope of this project involves three new 400/220 kV single phase transformers, a new 220 kV transformer bay, a new 400 kV transformer bay and the terminations within the Celtic Interconnector AC cable sealing end compound, adjacent to Knockraha 220 kV station.

These projects address the following policy drivers:

Sustainability

- Enable optimal renewable energy usage and transfer during periods of high wind power dispatches.

Security of supply

- Ensure safe, secure and reliable operation of the transmission system.

Market integration

- Enhance market efficiencies by facilitating energy imports and exports.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP1215	Knockraha Station Celtic IC Non-contested Works	New build connection	–	Cork	23/02/2022	06/12/2023	31/12/2026

Reinforcement of the transmission network in Limerick

Projects

- Killonan 220 kV Station Refurbishment – Killonan Station Works (CP0624).
- Limerick and Connected Station 110 kV Protection Upgrade (CP1112).

Description

The Killonan station is an important node on the network, as it is the main bulk supply point for the Midwest region. The project involves the replacement of the AIS station with a GIS station on an adjacent site. This is required because of the condition and age of the transmission equipment in the station.

At Limerick, Moneteen and Rathkeale stations protection upgrades are required due to aged protection relays. Project works include 110 kV bus zone protection scheme installations at Rathkeale station, installation of measurement devices (CT/VT) at Limerick and Rathkeale and a new fibre connection between Limerick and Moneteen.

These projects address the following policy drivers:

Security of supply

- Ensure safe, secure and reliable operation of the transmission system.
- Facilitate demand connection by increasing maximum import capacity at specific node.

Asset management

- Replacement of ageing transmission equipment.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP0624	Killonan 220 kV Station Refurbishment – Killonan Station Works	Refurbish/ Replace	–	Limerick	30/09/2011	01/04/2019	16/11/2027
CP1112	Limerick and Connected Stations 110 kV Protection Upgrade	Refurbish/ Replace	–	Limerick	21/05/2020	19/12/2023	31/12/2025

New generation and battery connections in the Southwest and Midwest

Projects

- Drombeg Solar 110 kV Station: solar farm connection (CP1062).
- Ballinknockane 110 kV New Station and Loop-in to Aughinish – Kilpaddoge 110 kV Circuit: solar farm connection (CP1069).
- Ballyvatta Solar Farm (Knockraha): new single Bay AIS 110 kV station, Ballynabrannagh, to be tailed into the existing Knockraha 220/110 kV station by approximately 2.8 km of underground cable (CP1128).
- Aghada BESS 02: connection of a battery storage to a bay in the existing Aghada 220 kV station via 220 kV underground cable (CP1129).
- Timoney 110 kV Station: new 4-bay C-type AIS 110 kV station, looped into the Shannonbridge – Ikerrin Tee – Thurles 110 kV circuit, via two underground cables (approximately 1.1km) (CP1236).
- Coumaclovane Solar Extension: extension of the existing Glanlee Wind Farm making the existing connection a hybrid plant (CP1240).
- Castletreasure 110 kV Station (Ballinrea Solar Park): new single bay AIS station, called Castletreasure 110 kV Station, tailed into the existing Raffeen 220/110 kV Station via approximately 4km of underground cable (CP1245).
- Coomnaclohy 110 kV Station (Knocknamork Wind and Solar Park): new single bay AIS station, Coomnaclohy 110 kV Station, tailed into the existing Ballyvouskill 220/110 kV Station via approximately 3.5 km of underground cable (CP1246).
- Ballynadrideen 110 kV Station (Ballyroe Solar): new tailed single bay AIS 110 kV station, connected via underground cable of approximately 3.4km to Charleville 110 kV Station (CP1351).
- Coolshamroge 110 kV Station (Manusmore Solar Park): new AIS 110 kV 4-bay C-type station to be called Coolshamroge 110 kV station; looped into the Drumline – Ennis 110 kV circuit via two underground cables (CP1354).

Description

These projects are needed to connect new Windfarm, solar farm and battery connections.

These projects address the following policy drivers:

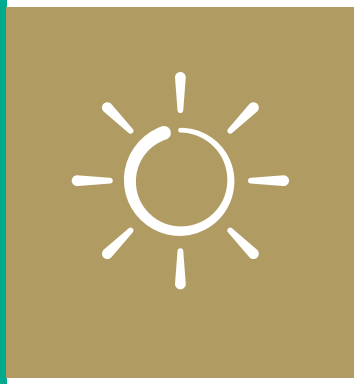
Sustainability

- Facilitating increased usage of renewable energy by connection of solar farms, a wind park and energy storage system.

Security of supply

- Improving competition and economic operation by removing operational constraints.
- Providing the required flexibility for increased renewable generation.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP1062	Drombeg Solar 110 kV Station	New build connection	–	Kerry	28/06/2019	17/12/2020	13/05/2025
CP1069	Ballinknockane Solar Farm	New build connection	–	Limerick	16/05/2019	24/12/2020	25/04/2025
CP1128	Ballyvatta Solar Farm (Knockraha)	New build connection	–	Cork	04/11/2021	30/04/2024	30/06/2025
CP1129	Aghada BESS 02	New build connection	–	Cork	05/11/2020	17/12/2021	02/02/2024
CP1236	Timoney 110 kV Station	New build connection	–	Tipperary	07/07/2022	01/04/2024	31/03/2025
CP1240	Coumaclovane Solar Extension	New build connection	–	Kerry	31/08/2022	30/09/2024	31/10/2025
CP1245	Castletreasure 110 kV Station (Ballinrea Solar Park)	New build connection	–	Cork	09/09/2022	28/06/2024	28/11/2025
CP1246	Coomnaclohy 110 kV Station (Knocknamork Wind and Solar Park)	New build connection	–	Cork	07/07/2022	30/08/2024	30/06/2025
CP1351	Ballynadrideen 110 kV Station (Ballyroe Solar)	New build connection	–	Cork	06/01/2023	20/02/2024	22/10/2026
CP1354	Coolshamroge 110 kV Station (Manusmore Solar Park)	New build connection	–	Clare	05/04/2023	20/05/2024	29/09/2025



Other approved projects

In addition to the network reinforcement projects described above, there are also other projects in the Southwest and Midwest, namely:

- Dunstown – Moneypoint 400 kV Line Refurbishment (CP0873): this refurbishment project follows from a Line Project Assessment Report with identification of various tasks. These include painting 573 steel towers of the existent 578, replacing cross arm insulators and vibration dampers, re-sagging and repairing conductors and replacing earthwire and associated hardware.
- Point on Wave Controller for Glanagow 220 kV Station (CP0983).
- Clahane – Tralee 110 kV Circuit Alteration (CP1437): the alteration of this circuit is to facilitate the future expansion of local customer demand.
- Glanagow – Raffeen 220 kV Circuit Alteration (CP1438): the proposed alteration of Glanagow – Raffeen 220 kV Cable at Cogan's Lane near Raffeen 220 kV Station is to facilitate the M28 Cork to Ringaskiddy Motorway construction and undergrounding a section of the overhead line.

These projects address the following policy drivers:

Security of supply

- Improving competition and economic operation by removing operational constraints.
- Providing the required flexibility for increased renewable generation.

Asset management

- Replacement of old, outdated equipment.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP0873	Dunstown – Moneypoint 400 kV Refurbishment	Refurbish/ Replace	209	Kildare, Laois, Tipperary, Clare, Offaly, Limerick	20/06/2014	05/12/2019	30/11/2026
CP0983	Point on Wave Controller for Glanagow 220 kV Station	Uprate/ Modify	–	Cork	04/08/2016	23/05/2017	10/11/2025
CP1437	Clahane-Tralee 110 kV Circuit Alteration	Uprate/ Modify	1.1	Kerry	27/09/2023	18/04/2024	[41]
CP1438	Glanagow – Raffeen 220kV Circuit Alteration	Uprate/ Modify	0.6	Cork	14/09/2023	19/04/2024	[41]

41 As of the data freeze date, the energisation date is not publicly available at this time.

5.4 The Southeast, Mideast and Dublin

Summary of projects

Project category	No. of projects
New build	49
Uprate/Modify	20
Refurbish/Replace	27
Other	4
Total	**100**

Active TDP projects by region

The Southeast, Mideast and Dublin has a wide variety of generation sources dispersed around the region including pumped storage, gas, hydro, solar, waste to energy and the 500 MW East West Interconnector (EWIC).

The greater Dublin area is the major load centre on the Irish transmission network. As demand grows in Dublin, there are transmission capacity constraints affecting transmission of power into and around Dublin. To address potential issues, the SEM Committee oversees the Single Electricity Market provisions locational capacity through the Capacity Market Auctions report[42].

The existing regional transmission network is comprised of 110 kV, 220 kV, 275 kV and 400 kV infrastructure. The transmission network must meet several diverse power flows that can vary depending on:

- The generation dispatch.
- Network demand.
- Interconnector flows.
- Network topology.

The network must accommodate high density demand in the area as well as local generation exports. Additionally, the network can be subject to high inter-regional power transfers from north to south and vice versa.

42 https://www.sem-o.com/documents/general-publications/T-4-2024-2025-Final-Capacity-Auction-Results-Report.pdf

The development of the transmission network in the area is characterised by the displacement of thermal generation in Dublin for wind generation resulting in power-transfer capacity and voltage support needs due to an increase in power flows in the region. This is because to integrate higher RES, the energy that was supplied by the thermal plants in the Dublin area will be supplied by onshore generation, coming from the West and Southwest and from the planned offshore wind generation connections on the Irish sea. The installation of offshore wind generation will at times reduce the impact of large transfers of power into the region from the West but creates other power-transfer capacity needs in the Greater Dublin Area.

A third party is undertaking the development of an additional HVDC interconnector between Ireland and Great Britain, known as the Greenlink Interconnector. The connection point for the interconnector is in the Southeast, by a new 220 kV GIS tailed station, Loughtown, which will connect into an existing bay in Great Island station. This interconnector is deemed a PCI by the European Commission. PCIs are intended to help the EU achieve its energy policy and climate objectives: affordable, secure and sustainable energy for all citizens. See Appendix A Irish Projects in European Plans for more information.

Network reinforcement will be required to cater for the power flows resulting from additional demand, generation and interconnection. This will enable the efficient transfer of power to the load centres of the east coast and the Dublin area.

In summary there are reinforcement needs due to:

- Local constraints related to power-transfer capacity and voltage support needs.
- Asset condition.
- Increase in wind power plants and solar farms connections and flexibility provision assets like energy storage systems.

The projects described in this section will enable the transmission network to accommodate more diverse power flows. They will also provide benefits to existing and future users of the transmission network and facilitate future regional load growth.

We will continue to assess reinforcement needs in the Southeast, Mideast and Dublin and to identify solutions as part of the assessment for the future network in EirGrid's strategy documents, aiming to find new projects required in the area beyond those already progressing through the grid development process.

The TDP contains a list of the committed projects as of 31st January 2024 and indicative completion dates are included for these projects.

The projects in the Southeast, Mideast and Dublin are discussed in more detail below.

Figure 5-3 (a) shows the location of projects in Steps 4 to 6 in the Southeast, Mideast and Dublin.

Figure 5-3 (a): Planned network developments in Steps 4 to 6 in the Southeast, Mideast and Dublin

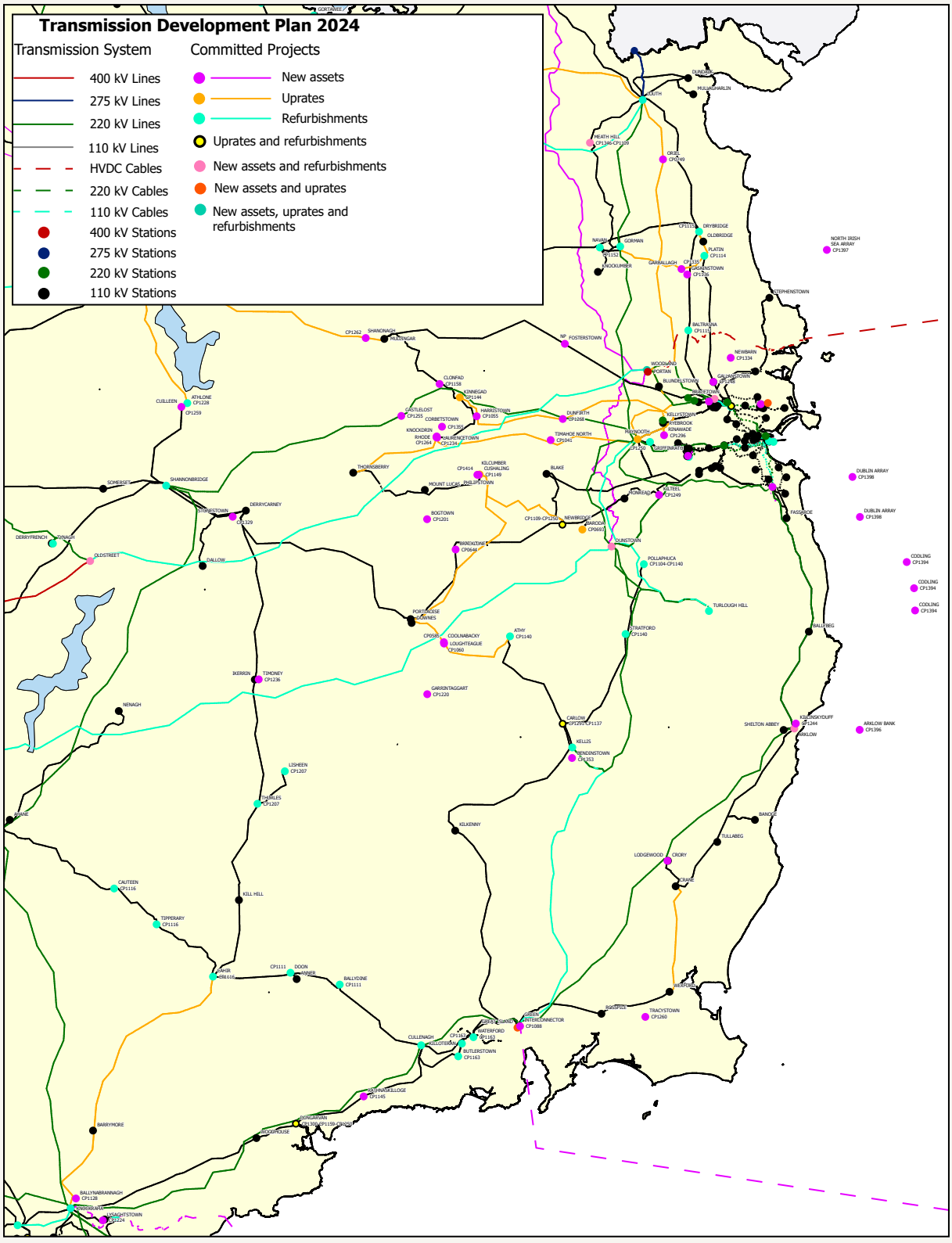
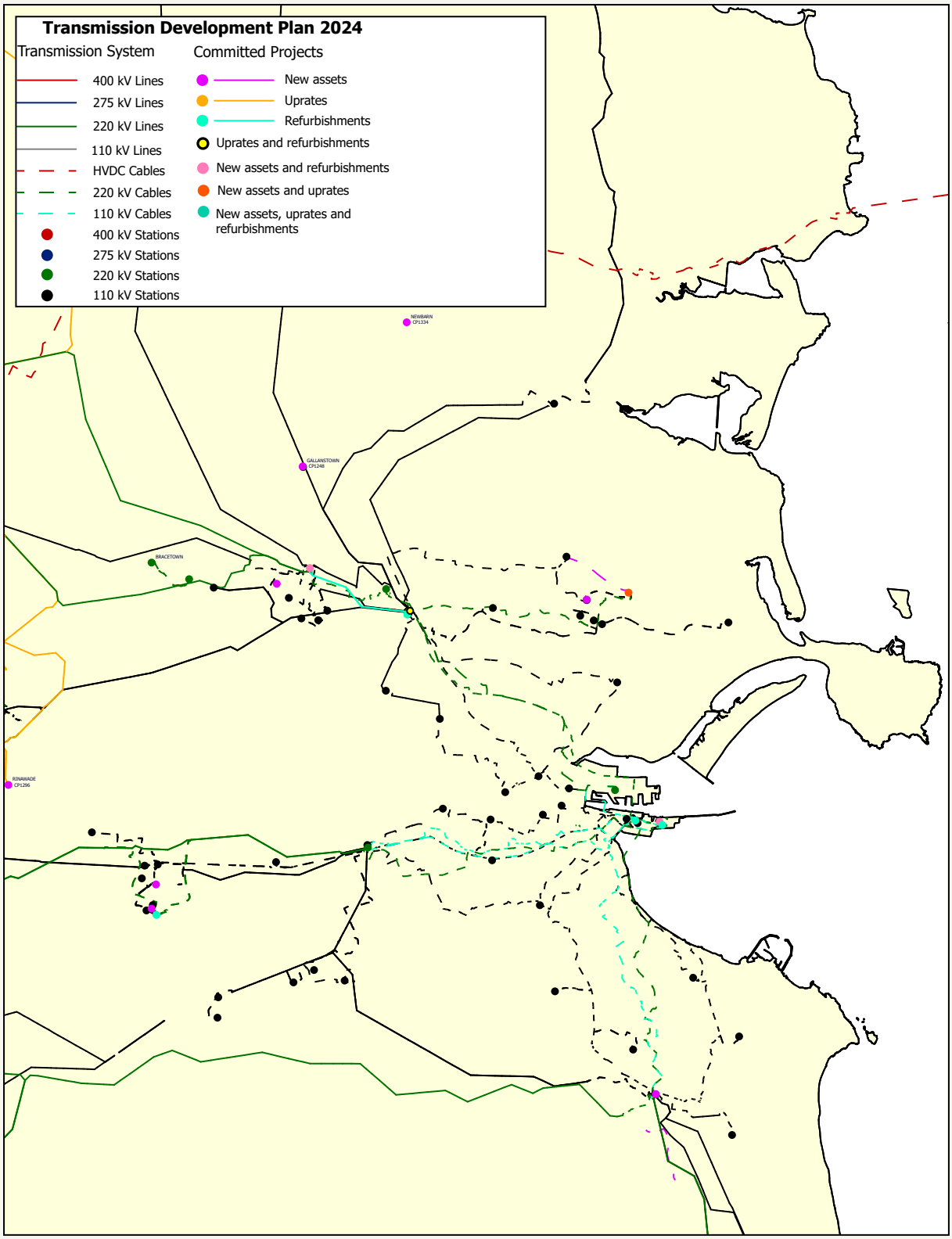


Figure 5-3 (b): Planned network developments in Steps 4 to 6 in Dublin



Reinforcement of the transmission network between Ireland and Wales

Project

Greenlink Interconnector (CP1088).

Description

The drivers for this project are market integration, security of supply and Sustainability.

The Greenlink Interconnector is a proposed subsea and underground electricity interconnector cable between the electricity grids in Ireland and Great Britain, with a nominal capacity of 500 MW. This committed project brings significant benefits on both sides of the Irish Sea, In Ireland and Wales, for integration of low carbon energy sources. In Ireland, it provides an additional link to EU and Nordic electricity market via Great Britain.

In Ireland, the project will consist of the construction of a new 220 kV GIS tailed station, Loughtown, which will connect via approx. 400m of underground cable into an existing bay at Great Island 220 kV GIS Station. The converter hall will be built beside the new Loughtown station.

The Greenlink Interconnection Development will offer significant benefits as summarised below. Furthermore, these projects address the following policy drivers:

Security of supply

- Diversification of energy sources.
- Doubling the interconnection capacity between Ireland and Great Britain while also enabling an integrated European grid.

Sustainability

- Supporting EirGrid in meeting the targets set in the Climate Action Plan.

Market integration

- Promoting energy price competition.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP1088	Greenlink Interconnector	New build connection	–	Wexford	20/02/2020	22/06/2022	28/06/2024

Reinforcement of the transmission network between Munster and Leinster

Projects

- Grid Link Option 3 Regional Option Solution, comprising:
  - Series Compensation on the existing 400 kV overhead lines that cross the country from Moneypoint in County Clare to Dunstown in County Kildare and Woodland in County Meath.
    The series compensation devices are planned for:
    - Moneypoint 400 kV Series Capacitor (CP0967)[43]
    - Dunstown 400 kV Series Capacitor (CP0968)
    - Oldstreet-Woodland 400 kV Series Capacitor (CP0969)[44].
  - Cross-Shannon 400 kV Cable (CP0970)[45].

Description

Facilitation of new generation together with existing generation and future interconnection in the Southeast introduces large regional electricity flows from the south towards the east coast of Ireland. These electricity flows cause three physical phenomena which must be addressed by the Grid Link project:

1. Voltage collapse.
2. Large phase angles.
3. Thermal overloads.

For more information on the Regional Solution and the need for it please see the report prepared for the Government appointed Independent Expert Panel[46].

These projects address the following policy drivers:

Sustainability

- Enabling connection of new generation sources.

Market integration

- Supporting future interconnection.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP0967	Moneypoint 400 kV Series Capacitor	New build capacity	–	Clare	31/08/2015	28/06/2024	31/12/2027
CP0968	Dunstown 400 kV Series Capacitor	New build capacity	–	Kildare	15/06/2016	13/12/2023	01/07/2027
CP0969	Oldstreet-Woodland 400 kV Series Capacitor	New build capacity	–	Galway	15/06/2016	13/12/2023	09/08/2027
CP0970	Cross Shannon 400 kV Cable	New build capacity	6	Clare, Kerry	21/09/2016	16/12/2021	22/05/2026

43 This project is in the Southwest and Midwest. It is included here as it is part of the Regional Solution.
44 This project is in the Border, Midlands and Midwest. It is included here as it is part of the Regional Solution.
45 This project is in the Southwest and Midwest. It is included here as it is part of the Regional Solution.
46 https://www.eirgrid.ie/site-files/library/EirGrid/Grid-Link-IEP-Summary.pdf

Reinforcement of the transmission network in the Midlands and Southeast including Kildare Project

- Laois – Kilkenny (Coolnabacky) 400 kV Station: new station and associated lines and station works (CP0585), comprising:
  - A new 400/110 kV station at Coolnabacky near Portlaoise (looped into the existing Dunstown – Moneypoint 400 kV and Athy – Portlaoise 110 kV lines)
  - A new 110 kV circuit from this station to a new 110 kV station at Ballyragget, Co. Kilkenny
  - A 110 kV uprate to the existing Ballyragget – Kilkenny line which is currently operated at 38 kV[47].

Description

This project is required to provide security of supply in Kilkenny, Carlow, Kildare and Laois. The need for reinforcement arises due to a shortage of transmission capacity and voltage support across the region. The studies indicated potential violations of voltage limits throughout the area under single contingency conditions and loss of load violations in Kilkenny under maintenance-trip conditions.

The installation of a capacitor in Kilkenny 110 kV station was a short-term measure to maintain supply standards to the area. The Laois – Kilkenny reinforcement addresses the medium to long term quality and Security of supply concerns.

This project has been impacted severely due to delays in the public planning process and significant land access delays/public opposition experienced over the years. These issues have resulted in several changes to the completion date.

Substantial progress has been made including the civil construction phase of the new Ballyragget 110/38 kV substation and handing over to the electrical contractor as well as the upgrade of the existing Kilkenny 110 kV substation completion. Furthermore, enabling works for the Coolnabacky 400/110 kV substation has begun.

This project addresses the following policy drivers:

Security of supply

- Enabling connection of new generation sources.
- Resolve local constraints on the transmission and distribution network.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP0585	Laois Kilkenny (Coolnabacky) 400 kV Station – new station and associated lines and station works	New build capacity	52	Laois, Kilkenny	16/04/2008	17/06/2016	02/11/2026

47 https://www.eirgrid.ie/community/projects-your-area/laois-kilkenny-grid-reinforcement

Reinforcement of the transmission and distribution networks in the Greater Dublin Area

Projects

- Carrickmines 220 kV GIS Development (CP0580).
- Finglas 110 kV Station Redevelopment (CP0646).
- Inchicore 220 kV GIS Station Upgrade (CP0692).
- Finglas 220 kV Reconfiguration Project (CP0792).
- Maynooth 220 kV Station Reconfiguration (CP0808).
- West Dublin New 220-110 kV Station (Castlebaggot 220 kV Station) (CP0872).
- Belcamp – Shellybanks 220 kV Cable (CP0984)[48]
- Corduff – Finglas No. 1 & 2 220 kV Line Refurbishment (CP1001).
- Corduff 220 kV Station Deep Works (CP1113).
- Poolbeg 220 kV Station (CP1190).

  Belcamp 220 kV Busbar Extension (CP1213)
- Darndale (Phase 2 – 3) 110 kV Customer Connections in Darndale 110 kV Station (CP1230)
- Batter Lane DSO Station (CP1281).

Description

The need for several reinforcements in the Greater Dublin Area is due to local constraints on the transmission and distribution networks. There is a requirement for additional capacity at several locations in the Greater Dublin Area due to increase in demand.

These are primarily at:

- The new Belcamp 220/110 kV station to the east of the existing Finglas 220/110 kV station.
- The new Castlebaggot (formerly West Dublin) 220/110 kV station between Inchicore and Maynooth 220/110 kV stations.

These needs were identified through co-ordinated TSO and DSO network studies. These studies indicated the overloading of several existing circuits and transformers under single contingency conditions.

With respect to the Castlebagot 220 kV station, this has been energised (a major deliverable) and a number of circuit transfers have been completed. The completion of the remaining circuit transfer works is outage dependent and it has not been possible to grant the required outages, hence the change in date of the project completion. It is anticipated that the project will be completed in 2024/2025 subject to the required outages being granted to enable the works to be completed.

Replacement of substation equipment works are progressing in Inchicore and Carrickmines 220/110 kV stations to address the condition and age of the assets. These stations are major bulk supply points in Dublin. Inchicore and Finglas 220 kV stations also have their own specific needs.

The need for these stations' upgrade projects arises due to several local constraints. In the case of Inchicore, network studies have indicated that the capacity of some of the existing switchgear is close to being exceeded.

48 This project also includes the fit-out of the 220 kV GIS station building built as part of CP0437.

Whereas in Finglas 220 kV station, studies have indicated the potential for loss of load without the associated project. The Belcamp – Shellybanks new 220 kV cable will provide a second 220 kV connection to the new Belcamp 220 kV station which lies to the east of Finglas 220/110 kV station.

Due to the specific needs that have been identified for Poolbeg 220 kV station which include refurbishment of the station from an asset age and condition perspective and the need to have connectivity for planned offshore, it has been concluded that to ensure continued safe and secure operation of the station, a new 220 kV GIS station should be built offline and the circuits transferred over to the new station. Once the final circuit has been transferred to the new GIS building, the existing AIS and GIS buildings can be fully decommissioned and demolished which will create space for future development.

The busbar construction at Belcamp and the planned use of the station has been changed, as it has been identified that Belcamp station will need to be expanded to accommodate all the expected future bay connections. This extension of the busbar will result in Belcamp 220 kV station having 18 line or transformer bays in an enhanced ring busbar configuration.

With respect to Maynooth station, the project was brought forward due to the condition and age of the assets and local constraints. The project involves construction of new 220 kV and 110 kV busbars in a new GIS station. The new 220 kV and 110 kV busbars will be built in an enhanced ring configuration and the short circuit rating of both busbars will be built to the current standard.

The need for deep reinforcements at Corduff 220 kV has been identified as a requirement of the connection of a new data centre facility. The current network in the area does not have the capacity to accommodate this new demand, as well as to allow planned maintenance of the 220/110 kV transformer at Corduff. The works at this station involve installation of a new 220 kV coupler bay and its associated protection, a new 220 kV transformer bay and its associated protection and a new 110 kV coupler bay with its protection.

Corduff – Finglas 220 kV line requires refurbishment to extend the life of the asset. The main elements of refurbishment include tower painting, insulators and hardware replacement, labels and danger notices and repair/civil works to existing foundation shear blocks.

Batter Lane substation is a DSO customer driven project looping into the existing Finglas – Stephenstown 110 kV overhead line circuit. The scope of works under the project is the removal of protection relays from the Finglas bay in Stephenstown substation and moving these relays to be installed in the new Finglas bay in the new Batter Lane substation.

Darndale 110 kV Station phase 2-3 project consists of three additional customer transformers connected to the spare bays at Darndale station. These new transformers are part of a connection offer of a large demand customer.

In summary, these transmission reinforcements in the Greater Dublin Area have the following benefits.

Furthermore, these projects address the following policy drivers:

Security of supply

- Resolve local constraints on the transmission and distribution network.
- Facilitate demand connection and data centre facility by increasing transmission capacity.

Sustainability

- Enable connectivity for planned offshore sources.
- Facilitate electrification of heat and transport.

Asset management

- Replacement and refurbishment of existing assets to extend their life.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP0580	Carrickmines 220 kV GIS Development	New build capacity	–	Dublin	22/03/2012	14/02/2012	[49]
CP0646	Finglas 110 kV Station Redevelopment	Refurbish/ Replace	–	Dublin	28/08/2009	24/08/2012	31/10/2025
CP0692	Inchicore – 220 kV GIS Station Upgrade	Uprate/ Modify	–	Dublin	21/09/2016	20/03/2019	30/11/2026
CP0792	Finglas 220 kV Reconfiguration Project	Uprate/ Modify	–	Dublin	22/04/2015	11/03/2018	31/10/2025
CP0808	Maynooth 220 kV Station Reconfiguration	Uprate/ Modify	–	Kildare	16/03/2021	06/06/2024	08/03/2028
CP0872	West Dublin New 220-110 kV Station (Castlebagot 220 kV Station)	New build connection	–	Dublin	07/07/2014	17/05/2017	25/10/2024
CP0984	Belcamp Shellybanks 220 kV Cable	New build capacity	10	Dublin	01/07/2016	15/07/2020	[49]
CP1001	Corduff – Finglas 1 & 2 220 kV Line Refurbishment	Refurbish/ Replace	3.7	Dublin	10/11/2022	28/06/2024	07/01/2028
CP1113	Corduff 220 kV Station Deep Works	New build capacity	–	Dublin	17/08/2020	02/06/2021	30/04/2024
CP1190	Poolbeg 220 kV Station	New build connection	–	Dublin	16/12/2021	30/10/2024	20/07/2027
CP1213	Belcamp 220 kV Busbar Extension	Uprate/ Modify	–	Dublin	16/12/2021	10/06/2024	23/12/2027
CP1230	Darndale Phase 2–3 110 kV customer Connections in Darndale 110 kV Station	New build connection	–	Dublin	17/06/2022	19/12/2022	19/08/2024
CP1281	Batter Lane DSO Station	New build capacity	–	Dublin	09/02/2023	01/05/2024	01/04/2025

49 As of the data freeze date, the energisation date is not publicly available at this time.

Asset Management Projects in the Greater Dublin Area

Projects

- Irishtown, Shellybanks and Connected Stations 220 kV Protection Upgrade (CP1162).
- Carrickmines Area 220 kV Cable Ducting (CP1200).
- Finglas – Corduff 220 kV Protection Upgrade (CP1225).

Description

Irishtown, Shellybanks and connected 220 kV stations upgrade involves replacement of aged protection relays and/or teleprotection interfaces in Carrickmines, Irishtown, Poolbeg and Shellybanks 220 kV stations. This project does not include any additional protection scheme enhancement, as the teleprotection is over fibre and the circuits have already differential protection. Corduff – Finglas 220 kV protection upgrade involves replacement of aged protection relays and tele-protection interfaces in Finglas 220 kV station and Corduff 220 kV station.

Carrickmines cable ducting project was developed due to the planned Glenamuck Distributor Road Scheme south of the existing Carrickmines 220 kV station. The new road scheme was identified as an opportunity to create underground access for cable circuits from the south to the nearby Carrickmines 220 kV station. The installation of conduits for the 220 kV cables in the new road layout would avoid the future need to interfere with the new road scheme, thereby avoiding disruption and additional civil works costs. The new 220 kV underground cable opportunities provided by the ducts placed in the new road scheme will allow for future new transmission circuits that need to connect the Carrickmines substation to other parts of the network or could be used for the connection of customers such as demand or generation, or new bulk supply points for distribution demand.

The policy drivers for these projects include:

Security of supply

- Facilitate connection of future demand and/or generation units.

Asset management

- Replacement of aged protection assets.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP1162	Irishtown, Shellybanks and Connected Stations 220 kV Protection Upgrade	Refurbish/ Replace	–	Dublin	04/02/2021	04/11/2021	30/11/2026
CP1200	Carrickmines Area 220 kV Cable Ducting	New build capacity	2.5	Dublin	30/09/2021	20/12/2022	31/03/2025
CP1225	Finglas – Corduff 220 kV Protection Upgrade	Refurbish/ Replace	–	Dublin	03/02/2022	13/12/2022	30/11/2026

New and modified demand connections in the Southeast, Mideast and Dublin

Projects

- Baroda 110 kV Station – 2 x 110 kV Trafo Bays DSO: two new 110 kV DSO transformer bays (CP0693).
- Kishoge 110 kV Station: new Kishoge 110 kV C-Type GIS Station, looping into the Aungierstown – Castlebagot 110 kV circuit via two underground cable circuits each approximately 1.7 km (CP1175).
- Kilcarbery – New Kilcarbery 110 kV C-Type GIS Station, looping into the Castlebaggot – Barnakyle 110 kV circuit via two underground cable circuits of approximately 0.25km (CP1188).
- Barnakyle MIC (Maximum Import Capacity) Increase (CP1198).
- Belcamp BSP Transfer: transfer the Newbury 110 kV station, currently supplied from Finglas station, to be fed from the new Belcamp 220/110 kV station (CP1241).
- Corkagh 110 kV Station Phase 2: transfer of load of a large demand customer from Kilmahud to Corkagh. The project includes 3 new 60 MVA transformers to be installed at customer facility and connected to the existing 3 spare bays at Corkagh 110 kV station (CP1265).
- Walterstown 110 kV Station DSO: install a new 110/38 kV station, named Walterstown 110 kV station, at a site approximately 3 km west of Hansfield Rail station in Co. Meath. Walterstown 110 kV station will be a 4-bay C-type and will loop in via UGC into the existing transmission Dunfirth – Rinawade 110 kV circuit (CP1284).
- Rinawade 110 kV GIS Station (Liffey Park): rebuild of the Rinawade 110 kV station will replace the existing Rinawade AIS Substation whilst bringing the new substation in line with current policy and modern standards. An offline 4-bay C-type expandable GIS Substation will be built by the customer (CP1296).

Description

The need for these reinforcements arises due to the requirement for new and modified demand connections. These are shallow connections for several DSO connections and directly connected large scale transmission demand customers.

These projects address the following policy drivers:

Security of supply

- Facilitate the electrification of heat and transport and connection of large demand and data centre facilities.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP0693	Baroda 110 kV Station – 2 x110 kV Trafo Bays DSO	Uprate/ Modify	–	Kildare	14/06/2019	10/01/2020	30/03/2025
CP1175	Kishoge 110 kV Station	New build connection	–	Dublin	09/08/2021	19/01/2024	22/11/2024
CP1188	Kilcarbery	New build connection	–	Dublin	08/07/2021	16/02/2024	27/06/2025
CP1198	Barnakyle MIC Increase	Refurbish/ Replace	–	Dublin	27/10/2022	04/09/2024	23/06/2025
CP1241	Belcamp BSP Transfer	Other	–	Dublin	01/09/2022	01/05/2024	01/04/2025
CP1265	Corkagh 110kV Station Phase 2	New build connection	–	Dublin	26/07/2022	25/10/2023	24/07/2025
CP1284	Walterstown 110kV Station DSO	New build capacity	–	Meath	15/12/2023	10/10/2025	10/10/2027
CP1296	Rinawade 110 kV GIS Station (Liffey Park)	New build capacity	–	Kildare	06/11/2023	08/07/2024	31/03/2027

Reinforcement of the transmission network in the Southeast, Mideast and Dublin Projects

- Maynooth – Turlough Hill 220 kV Line Refurbishment (CP0823).
- Great Island – Kellis 220 kV Line Uprate (CP0866).
- Maynooth – Woodland 220 kV Line Uprate (CP0869).
- Kildare – Meath Grid Upgrade (CP0966).
- East Meath – North Dublin Reinforcement (CP1021).
- Dunstown T4201 and Woodland T4201 Transformer replacement (CP1086).
- Turlough Hill 220 kV Station Refurbishment (CP1195).
- Dunstown Asset Replacements (CP1197).
- Louth – Woodland 220 kV Uprate (CP1235).
- Arklow 220 kV Station Redevelopment (CP1238).

Description

Maynooth – Turlough Hill 220 kV line is 51.4km in length and passes through counties Wicklow and Kildare. This line is essential for system security in the east region. A Line Condition Assessment (LCA) in 2012 and Line Project Assessment Report (LPAR) in 2015 highlighted that refurbishment is required to maintain the life of the asset and is essential to ensure continued operation.

The Great Island – Kellis 220 kV circuit connects the Great Island 220 kV station in Co. Wexford and the Kellis 220 kV station in Co. Carlow and is a key part of the transmission network in the Southeast part of the country. The need in this case, involves an uprate of the circuit between Great Island and Kellis 220 kV substations to facilitate power flows between greater Dublin and the Southeastern part of Ireland.

The Maynooth – Woodland 220 kV circuit runs through predominantly agricultural land from south of Maynooth, Co. Kildare to Woodland Station in Co. Meath. The Maynooth – Woodland 220 kV line refurbishment and uprate will address the asset condition of the Maynooth-Woodland 220 kV line and local constraints related to power-transfer capacity and voltage support caused by several factors including the addition of the transmission circuits comprising Kellystown Sub-station.

Kildare – Meath Grid Upgrade consists of a suite of transmission network reinforcements centred on strengthening the network between the existing Dunstown 400 kV substation in County Kildare and the Woodland 400 kV substation in County Meath via a high voltage 400 kV underground cable. The project is essential to enable further integration of renewable energy generation in line with Government policy to meet the 2030 targets. The project requires the installation of shunt reactors at each end of cable, one dynamic reactive support device and bays to be constructed on the 400 kV busbars in Woodland and Dunstown stations.

The East Meath North Dublin Grid Upgrade project is a proposed electricity transmission development that will help transfer electricity from the Woodland 400 kV to a new 400 kV GIS busbar at Belcamp. That new 400 kV GIS busbar at Belcamp will be connected to the planned 220 kV GIS busbar extension being progressed under CP1213.

The Louth – Woodland 220 kV line uprate, which involves an increase in network capacity between the existing Louth and Woodland 220 kV stations, is driven by a need to facilitate power flows between Ireland and Northern Ireland and to integrate offshore renewable generation off the east coast.

Turlough Hill station refurbishment involves the replacement of equipment due to age and those not supported anymore by the Original Equipment Manufacturer (OEM).

The circuit breakers to be replaced at Woodland and Dunstown have known reliability issues and two major failures in the past decade. Based on a 45-year life expectancy, they have reached the end of their life. Due to the criticality of these assets to the network, it is recommended by both TAO and TSO that these circuit breakers be removed from the system and replaced with new assets. This project will also include the replacement and refurbishment of assets associated with each bay to ensure reliable performance of these critical assets for the future. Moreover, the two transformers Dunstown T4201 and Woodland T4201 require replacement due to their tertiary windings not being suitably rated for the fault currents they may experience. Specifically, corrective and refurbishment work which involve chokes installation on both transformers to achieve suitable ratings and replacement of Dunstown T4201 will be done.

The Arklow 220 kV station redevelopment is to enable offshore wind development. The Arklow station is a high critical transmission station and an important node along the coastal corridor between Dublin and the southeast. The comprehensive redevelopment of the 220 kV station is needed because it is nearing its end of life.

These projects address the following policy drivers:

Security of supply

- Facilitate transfer of bulk power across the island.
- Facilitate demand connection and data centre facility by increasing transmission capacity.

Sustainability

- Enable connection of renewable energy sources to meet the Climate Action Plan.
- Integrate offshore renewable generation off the east coast.

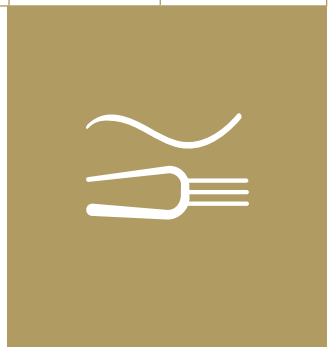
Market integration

- Increase network capacity to facilitate power flows across the north and south of the Island.

Asset management

- Replacement and refurbishment of existing assets to extend their life.
- Installation of new assets to ensure reliability during faults.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP0823	Maynooth – Turlough Hill 220 kV Line Refurbishment	Refurbish/ Replace	53	Kildare, Wicklow	30/06/2017	05/12/2024	01/11/2026
CP0866	Great Island – Kellis 220 kV Line Uprate	Refurbish/ Replace	70	Wexford, Carlow	16/11/2022	30/06/2025	30/11/2029
CP0869	Maynooth – Woodland 220 kV Line Uprate	Uprate/ Modify	22	Kildare, Meath	15/08/2019	17/12/2020	30/11/2024
CP0966	Kildare Meath	New build capacity	50	Meath, Kildare	24/03/2021	29/11/2024	22/09/2028
CP1021	East Meath – North Dublin Reinforcement	New build capacity	45	Meath, Dublin	07/06/2022	30/06/2025	31/12/2029
CP1086	Dunstown T4201 and Woodland T4201 Transformer Replacement	Refurbish/ Replace	–	Kildare, Meath	01/05/2023	31/07/2024	30/10/2028
CP1195	Turlough Hill 220 kV Station Refurbishment	Refurbish/ Replace	–	Wicklow	06/09/2023	01/07/2026	03/12/2029
CP1197	Dunstown Asset Replacements	Refurbish/ Replace	–	Meath, Carlow, Dublin Kildare	31/12/2021	19/12/2023	03/12/2029
CP1235	Louth – Woodland 220 kV Uprate	Uprate/ Modify	61.2	Louth, Meath	28/04/2022	02/06/2025	03/12/2029
CP1238	Arklow 220 kV Station Redevelopment	Refurbish/ Replace	–	Wicklow	20/04/2023	01/09/2025	01/09/2029



Reinforcement of the transmission network in Louth

Projects

- Louth 220 kV Station Refurbishment (CP0799).
- Drybridge and Connected Stations 110 kV Protection Upgrade (CP1115).
- Gorman – Platin 110 kV Line Uprate (CP1166).

Description

The need for reinforcement of the Louth 220 kV station arises due to a shortage of transmission capacity and the possible overloading of the 110 kV busbars and some circuit breakers under certain contingency conditions. In addition, the station upgrades involve refurbishment works due to the condition of the assets and replacement of strung bay conductors with tubular conductor to accommodate mechanical forces from short circuit currents. These works will be undertaken at the same time as the uprating works.

The Baltrasna, Drybridge and Gorman 110 kV stations project includes the replacement of older protection relays and teleprotection interfaces, as well as protection system upgrade work to ensure compliance with transmission system protection best practice.

The project also caters for connection of two new solar PV connections at Deenes and Garballagh. Critical components of the project scope include the installation of the 110 kV bus zone protection scheme at Baltrasna station and the installation of new current and voltage transformers at Drybridge bays T141 and T142.

Gorman – Platin 110 kV line uprate is necessary as the circuit does not have adequate transfer capacity for the connection of a large new demand. The uprate will also help to accommodate large power flows along the Gorman – Platin 110 kV circuit in the event of an unexpected loss of the Corduff – Platin 110 kV line while the Drybridge – Oldbridge 110 kV line is on outage or vice versa.

These projects address the following policy drivers:

Security of supply

- Enable secure and reliable operation of power system by avoiding busbar and line overloads.

Asset management

- Replacement and refurbishment of ageing protection assets.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP0799	Louth 220 kV Station Refurbishment	Uprate/ Modify	–	Louth	25/09/2013	12/03/2020	28/02/2029
CP1115	Drybridge and Connected Stations 110 kV Protection Upgrade	Refurbish/ Replace	–	Louth, Meath	13/05/2020	16/04/2021	30/11/2025
CP1166	Gorman – Platin 110 kV Line Uprate	Uprate/ Modify	19.4	Meath	18/03/2021	18/04/2024	24/11/2025

Reinforcement of the transmission network in Meath

Projects

- Gorman and Connected Station 220-110 kV Protection Upgrade (CP1109).
- Woodland Station 400-220 kV Protection Upgrade (CP1110).
- Platin and Connected Stations 110 kV Protection Upgrade (CP1114).
- Kinnegad 110 kV Station, Derryiron 110 kV Bay Conductor Uprate (CP1144).
- Drybridge – Oldbridge – Platin 110 kV Line Uprate (CP1167).
- Woodland 400 kV Station Redevelopment (CP1194).

Description

The protection system upgrades are necessary to ensure compliance with transmission system protection best practices and involve replacement of aged protection relays and teleprotection interfaces to mitigate sub-optimal performance of the protection system. Gorman 220 kV, Navan and Meath Hill 110 kV stations project includes the installation of CT/VT units at Navan station. Woodland station project includes the replacement of protection relays at Woodland 400 kV station. The Platin and Gorman 110 kV protection upgrade project includes the installation of the Platin 110 kV busbar area protection scheme and extension work to its building, to make room for the new protection relay panels.

Due to potential voltage collapse and a security of supply risk, the Woodland station needs redevelopment. It has several major 400 kV and 220 kV circuits connected and several grid infrastructure developments are planned to connect in the coming years. At times of high-power flow through Woodland 400 kV station, there is potential for a significant security of supply issue to arise from single contingencies, such as unexpected loss of a single circuit or piece of equipment, resulting in voltage collapse of the transmission system. To address these issues, this project has received approval for an in-situ reconfiguration of the existing 400 kV AIS double busbar to a ring busbar configuration.

The uprate of Drybridge – Platin 110 kV will help to accommodate increased power flows that can occur with the maintenance and trip combination of the Corduff – Platin 110 kV line along with either the Gorman – Platin 110 kV circuit or the Gorman 220/110 kV transformer.

Kinnegad 110 kV station uprate was part of wider site-related connection equipment work being carried out to allow for the connection a new windfarm at Cloncreen, Co. Offaly. The uprate of the bay conductor equipment at Kinnegad, in the Derryiron 110 kV bay, will allow the connection of the windfarm and the circulation of large power flow along Derryiron – Kinnegad 110 kV circuit in case there is a loss of the Derryiron – Timahoe North 110 kV circuit.

These projects address the following policy drivers:

Security of supply

- Facilitate connection of large demand and data centre facility by increasing transmission capacity.
- Enable secure and reliable operation of power system by avoiding busbar and line overloads.

Sustainability

- Enable connection of renewable energy sources.

Asset management

- Replacement and refurbishment of ageing protection assets.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP1109	Gorman and Connected Stations 220-110 kV Protection Upgrade	Refurbish/ Replace	–	Meath	13/05/2020	25/06/2021	01/12/2025
CP1110	Woodland Station 400-220 kV Protection Upgrade	Uprate/ Modify	–	Meath	18/05/2020	19/03/2021	[50]
CP1114	Platin and Connected Stations 110 kV Protection Upgrade	Refurbish/ Replace	–	Meath	13/05/2020	18/08/2021	30/11/2025
CP1144	Kinnegad 110 kV Station, Derryiron 110 kV Bay Conductor Uprate	Uprate/ Modify	–	Meath	22/01/2021	01/12/2021	29/11/2025
CP1167	Drybridge – Oldbridge – Platin 110 kV Line Uprate	Uprate/ Modify	5.3	Louth, Meath	18/03/2021	27/10/2023	25/11/2025
CP1194	Woodland 400 kV Station Redevelopment	Uprate/ Modify	–	Meath	21/03/2022	14/12/2023	30/11/2028

50 As of the data freeze date, the energisation date is not publicly available at this time.

Reinforcement of the transmission network in Kildare

Projects

- New 400 kV Strategic Spare Transformer (CP1092).
- Pollaphuca Refurbishment Project (CP1104).
- Dunstown Station 400-220 kV Protection Upgrade (CP1108).
- Intel 110 kV line diversion (CP1277).
- Maynooth – Rinawade 110 kV Line Uprate (CP1390).
- Rinawade – Dunfirth 110 kV Uprate (CP1403).

Description

CP1092 was developed to hedge against potentially high balancing costs. In 2019, problems arose with the two existing 400 kV/220 kV transformers at Moneypoint 400 kV Station, these included a major failure of transformer T4201 and the placing of an operational restriction on transformer T4202. These incidents coincided with a significant number of scheduled outages at Moneypoint which were required to facilitate transfer to the new GIS Station. The financial impact on Dispatch Balancing Costs (DBC) and Wind Constraints as result of these outages and restrictions has been significant due to the increase in cost of running more expensive generation, predominantly Tarbert Power Station. The new 400 kV transformer will be custom built, capable of being transported and installed, if required, in any of the 400 kV/220 kV stations in Ireland.

Pollaphuca refurbishment involves removing the constraint to the hydro generator located at Pollaphuca station.

The needs for a protection relay replacement at Dunstown station are based on the age profile of existing devices, to mitigate against sub optimal protection system performance and to support the anticipated high power-transfer capacity of onshore windfarms in the western region of the island. This project involves replacement of 8 x protection relays in Dunstown 400 kV station.

A large customer has requested a significant alteration to the existing Maynooth – Ryebrook and Dunfirth – Rinawade 110 kV double circuit lines to facilitate future developments at their facilities. A Circuit Alteration Request (CAR) was submitted by ESB Networks to EirGrid. As TSO, EirGrid has assessed the impact of this CAR and will progress the project forward thorough its six-step Grid Development Framework.

The Maynooth-Rinwade 110 kV and Rinawade – Dunfirth 110 kV uprates are essential for the connection of renewable generation in greater Dublin and the midlands. The Rinawade – Dunfirth Tee – Kinnegad 110 kV circuit forms an important part of the transmission network in the Midlands region, supplying local transmission stations, industrial customers and facilitating diverse power flows through the Midlands. This circuit is also integral to facilitating the connection of renewable generation in the wider region and will play an important role in meeting the Government's renewable electricity target for 2030.
To facilitate the connection of upcoming solar and wind generation in the region, new 110 kV stations namely Harristown, Mulgeeth and Walterstown will connect to the transmission system in the coming years by looping into the existing Rinawade – Dunfirth Tee – Kinnegad 110 kV circuit.

These projects address the following policy drivers:

Security of supply

- Facilitate connection of large demand by increasing transmission capacity.
- Enable secure and reliable operation of power system by avoiding busbar and line overloads.

Sustainability

- Enable continued operation of renewable energy source.
- Facilitate connection of renewable energy sources in the Midlands region.

Asset management

- Provision of a mobile transformer for secure and efficient operation of the transmission network.
- Replacement and refurbishment of ageing protection assets.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP1092	New 400 kV Strategic Spare Transformer	New build capacity	–	Kildare	29/01/2020	15/12/2022	27/06/2025
CP1104	Pollaphuca Refurbishment Project	Refurbish/ Replace	–	Kildare	08/09/2023	31/05/2025	31/05/2028
CP1108	Dunstown Station 400-220 kV Protection Upgrade	Refurbish/ Replace	–	Kildare	18/05/2020	19/03/2021	[51]
CP1277	Intel 110kV Line Diversion	Uprate/ Modify	10	Kildare	30/11/2022	29/03/2024	28/11/2025
CP1390	Maynooth – Rinawade 110 kV Line Uprate	Uprate/ Modify	6.9	Kildare	06/06/2023	07/03/2025	01/11/2029
CP1403	Rinawade – Dunfirth 110 kV Uprate	Uprate/ Modify	28.8	Kildare, Meath	18/05/2023	30/05/2026	28/09/2029

51 As of the data freeze date, the energisation date is not publicly available at this time.

Reinforcement of the transmission network in Carlow

Projects

- Carlow, Kellis 110 kV Protection Upgrade (CP1137).
- Athy, Carlow and Connected 110 kV Stations Protection Upgrade (CP1140).
- Kellis Station 220 and 110 kV Protection Upgrade (CP1141).
- Carlow 110 kV Station Busbar Thermal Capacity Need (CP1291).

Description

The first three projects mentioned involve replacement of aged protection relays and teleprotection interfaces. Kellis station is part of the 220 kV circuit from Great Island to Dunstown and the refurbishment of the stations in the Carlow network will support increased power flows from Great Island due to the connection of the Greenlink Interconnector in Co. Wexford. The Protection Upgrade at Carlow and Kellis stations includes the installation of a new 110 kV bus bar protection scheme and a new combined Current transformer/Voltage transformer (CT/VT) at Carlow 110 kV station. It is also possible that the control room at Carlow 110 kV station may not have adequate space for new relay cabinets, so provision has been made to extend the control room if required.

This project also includes wrapping of optical fibre on the Carlow – Kellis 110 kV No. 1 circuit to allow teleprotection and differential protection on both Carlow – Kellis 110 kV circuits.

CP1140 involves replacement of aged protection relays in Athy, Carlow, Pollaphuca and Stratford 110 kV stations. This project includes the installation of a new duplicate distance relay in Athy, new current and voltage transformers in Carlow station on the Pollaphuca/Stratford bay and also in Pollaphuca station on the Carlow/ Stratford bay.

Carlow busbar thermal capacity project is due to higher power flows across the existing 110 kV Carlow busbar during times of high interconnection imports in the South and Southeast and high renewable generation in the Southeast. An increase of thermal capacity of the 110 kV busbar is required to resolve the generation and transfer constraints.

These projects address the following policy objectives:

Security of supply

- Resolve power transmission constraints during periods of interconnection imports.

Sustainability

- Enable connection and efficient utilization of renewable energy source.

Asset management

- Replacement and refurbishment of ageing protection assets.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP1137	Carlow, Kellis 110 kV Protection Upgrade	Refurbish/ Replace	– –	Carlow	01/10/2020	01/09/2021	10/06/2025
CP1140	Athy, Carlow and Connected Stations 110 kV Protection Upgrade	Refurbish/ Replace		Carlow, Kildare, Wicklow	01/10/2020	16/07/2021	10/11/2025
CP1141	Kellis Station 220 kV & 110 kV Protection Upgrade	Refurbish/ Replace	–	Carlow	01/10/2020	01/09/2021	10/11/2025
CP1291	Carlow 110 kV Station Busbar Thermal Capacity Need	Uprate/ Modify	–	Carlow	07/06/2023	20/12/2024	23/11/2029

Reinforcement of the transmission network in Wexford

Projects

- Crane – Wexford 110 kV Thermal Uprate (CP1172).
- Great Island 220/110 kV Transformer Uprates (CP1242).

Description

The existing Crane – Wexford 110 kV circuit is a key component in the transmission network, supplying local transmission stations, facilitating power flows through the Southeast in either direction, i.e., towards the East/Dublin or South/Cork and facilitating the connection of renewable generation in county Wexford. Under contingency conditions, system analysis indicates that power flows along the Crane – Wexford 110 kV circuit exceeding the thermal rating of the circuit can occur due to an unplanned loss of either Great Island – Lodgewood 220 kV circuit or Great Island – Rosspile 110 kV circuit, which is in breach of the TSSPS. Increasing the capacity of Crane – Wexford 110 kV will help to cater for the expected increase in power flow for this area.

The transformer uprates at Great Island project involves the replacement of two transformers. Additionally, an asset condition need has been identified regarding both transformers which are near the end of their service lives and show deteriorating condition.

The two 220/110 kV transformers at Great Island station have a rating of 125 MVA and they have a low 30-minute overload capability of 110% and 130%. The network capacity need concerns the transfer of power between the 220 kV and 110 kV busbars at Great Island station. The unplanned loss of the Cullenagh – Great Island 220 kV circuit in scenarios when interconnectors are exporting power in high renewables cases or importing power in low renewables cases can cause power flows on each of the 220/110 kV transformers at Great Island greater than their respective overload capabilities.

These projects address the following policy objectives:

Security of supply

- Resolve power transmission constraints during periods of interconnection exports and imports.

Sustainability

- Enable connection and efficient utilization of renewable energy source.

Asset management

- Replacement and refurbishment of ageing transmission assets.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP1172	Crane – Wexford 110 kV Line Uprate	Uprate/ Modify	22.8	Wexford	17/06/2021	09/10/2023	30/11/2025
CP1242	Great Island 220-110 kV Transformer Upgrades	Uprate/ Modify	–	Wexford	07/12/2022	20/12/2023	01/11/2028

Reinforcement of the transmission network in Waterford

Projects

- Cullenagh and Connected Stations Protection Upgrade (CP1159)
- Butlerstown, Killoteran and Waterford 110 kV Protection Upgrade (CP1163)

Description

The driver for these projects is security of supply.

These projects involve replacement of aged protection relays and teleprotection interface in: Cullenagh 220 kV station and Ballydine, Butlerstown and Dungarvan 110 kV stations for CP1159; and replacement in Cullenagh 220 kV station, Butlertown, Killoteran and Waterford 110 kV stations. The replacements are required to ensure compliance with best practice in transmission system protection.

The existing power line carrier teleprotection on the Cullenagh – Dungarvan 110 kV line will be transferred to fibre based teleprotection interfaces utilising the existing fibre network between these stations. Installation of a new bus-bar protection scheme in Killoteran station is also included in CP1163.

These projects address the following policy objectives:

Security of supply

- Ensure secure and complaint operation of the transmission network.

Asset management

- Replacement and refurbishment of ageing protection assets.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP1159	Cullenagh and Connected Stations Protection Upgrade	Refurbish/ Replace	–	Waterford	04/12/2020	04/11/2021	30/11/2025
CP1163	Butlerstown, Killoteran & Waterford 110 kV Protection Upgrade	Refurbish/ Replace	–	Waterford	04/02/2021	04/11/2021	10/11/2025

New generation and battery connections in the Southeast, Mideast and Dublin Projects

- Timahoe 110 kV Station (Timahoe North Solar Farm): loop-in to Derryiron – Maynooth 110 kV circuit – Solar Farm Connection (CP1041).
- Harristown Solar Farm – Harristown 110 kV New Station and Loop-in to Kinnegad – Dunfirth Tee – Rinawade 110 kV Circuit – Solar Farm Connection (CP1055).
- Deenes 110 kV Station – Gaskinstown Solar Farm – Gaskinstown Solar Farm: new 4 Bay C-type 110 kV AIS Station, Deenes, connected by UGC and looped into the existing Baltrasna – Drybridge 110 kV (CP1136).
- Rathnaskilloge Solar Farm: new 110 kV GIS station, Rathnaskilloge, to be looped into the existing Cullenagh – Dungarvan 110 kV circuit (CP1145).
- North Arklow Solar plus storage facility: new AIS single bay 110 kV station with a tailed connection to Arklow 220/110 kV Station via UGC (CP1244).
- Harlockstown Solar (Gallanstown Extension): to be connected to the new Gallanstown 110 kV station. Gallanstown station is looped into the Corduff – Platin 110 kV circuit (CP1248).
- Porterstown Battery Phase 2: to be connected via an over the fence into an existing transformer at Kilteel 110 kV (CP1249).
- Dennistown 110 kV Substation: new C-type bay AIS station, Dennistown 110 kV station, tailed into the existing Wexford 110 kV station via approximately 9.8 km of UGC (CP1260).
- Arklow 220 kV, DSO Ballymanus Windfarm: connection via DSO Network into the existing Arklow 220 kV GIS station via a terminal remote unit and a 110 kV DSO transformer bay (CP1267).
- Dunfirth 110 kV – DSO Dysart PV: connection via DSO Network into the existing Dunfirth 110 kV via 1.3 km UGC. Dunfirth transformers will be uprated and there will be associated protection upgrades (CP1268).
- The Dell Solar Lodgewood 220 kV Crory Station: new build connection via the DSO Crory 20 kV network from the Lodgewood 110 kV busbar. A new 110 kV 31.5 MVA transformer is required to facilitate this connection (CP1269).
- Newbarn 110 kV Station (Fieldstown Solar Farm): to be connected via a tailed 100 kV AIS station (Newbarn) to the existing transmission network via 12km of underground cable to Finglas 110 kV station (CP1334).
- Garballagh 110 kV Station (Garballagh 2 Solar Farm): to be connected via the existing Garballagh 110 kV GIS Station, which is looped into the Gorman – Platin 110 kV circuit. The solar farm and station will connect via an under the fence connection with 0.5km of UGC (CP1335).
- Effernoge 110 kV Station (Tomsallagh Solar): to be connected via loop-in to the Crane – Lodgewood line through 2 overhead lines and construction of a new 110 kV AIS C-type station to be known as Effernoge 110 kV station (CP1338).
- Drumcamill 110 kV Station (Monvallet Hybrid Solar and Battery Farm): new 110 kV AIS station named Drumcamill via 0.2 km of underground cable from bay H8 in Louth 220/110 kV AIS station (CP1342).

- Meath Hill 110 kV Station (Ardagh South Energy Storage): connection to the Meath Hill 110 kV station (CP1346).
- Dunbrody 110 kV Station (Kilmannock Battery Storage Facility Phase 2): connection method is a new AIS 110 kV tailed station, named 'Dunbrody', connected via 0.6 km of Under Ground Cable (UGC) to the Great Island AIS 110 kV indoor station (CP1347).
- Bendinstown 110 kV Station (Garreenleen Solar): to be connected via a tailed AIS station connected via 4.1km of underground cable to Kellis 220/110 kV station (CP1353).

Description

These projects involve various connections of new wind farms, solar farms and battery energy storage systems. Their benefits are summarised according to their drivers below:

Security of supply

- Facilitate flexible and efficient of transmission network by the connection of renewable units and storage systems.

Sustainability

- Connection and efficient utilization of renewable energy source.

Market integration

- Improving competition and economic operation by removing operational constraints.
- Providing the required flexibility for increased renewable generation

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP1041	Timahoe 110 kV Station (Timahoe North Solar Farm)	New build connection	–	Kildare	06/11/2018	21/10/2021	26/07/2024
CP1055	Harristown Solar Farm	New build connection	–	Meath	20/12/2018	19/11/2020	31/10/2025
CP1136	Deenes 110 kV Station (Gaskinstown Solar Farm)	New build connection	–	Meath	19/11/2020	14/12/2022	18/09/2024
CP1145	Rathnaskilloge Solar Farm	New build connection	–	Waterford	07/01/2021	22/07/2022	23/09/2024

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP1244	North Arklow Solar Plus Storage	New build connection	–	Wicklow	06/10/2022	20/06/2024	30/09/2025
CP1248	Harlockstown Solar (Gallanstown Ext)	New build connection	–	Meath	01/06/2022	20/12/2023	14/02/2024
CP1249	Porterstown Battery Phase 2	New build connection	–	Kildare	01/06/2022	30/11/2023	24/03/2025
CP1260	Dennistown 110kV Substation	New build connection	–	Wexford	30/05/2022	28/02/2024	30/06/2025
CP1267	Arklow 220kV – DSO Ballymanus WF	New build connection	–	Wicklow	30/09/2022	06/11/2023	01/12/2025
CP1268	Dunfirth 110kV – DSO Dysart PV	New build connection	–	Kildare	30/09/2022	29/03/2024	01/08/2025
CP1269	The Dell Solar Lodgewood 220kV Crory Station	New build connection	–	Wexford	01/09/2022	20/12/2023	16/04/2026
CP1334	Newbarn 110 kV Station (Fieldstown Solar Farm)	New build connection	–	Dublin	01/08/2023	29/11/2024	01/06/2027
CP1335	Garballagh 110 kV Station (Garballagh 2 Solar Farm)	New build connection	–	Meath	20/07/2023	29/09/2024	20/02/2025
CP1338	Effernoge 110 kV Station (Tomsallagh Solar)	New build connection	–	Wexford	15/09/2023	18/11/2024	15/07/2027
CP1342	Drumcamill 110 kV Station (Monvallet Hybrid Solar and Battery Farm)	New build connection	–	Louth	06/06/2023	09/09/2024	08/06/2027
CP1346	Meath Hill 110 kV Station (Ardagh South Energy Storage)	New build connection	–	Meath	04/09/2023	29/11/2024	31/08/2027
CP1347	Dunbrody 110 kV Station (Kilmannock Battery Storage Facility Phase 2)	New build connection	–	Wexford	14/06/2023	09/09/2024	08/06/2027
CP1353	Bendinstown 110kV Station (Garreenleen Solar)	New build connection	–	Carlow	20/04/2023	28/06/2024	20/04/2027

Offshore projects in Wicklow and Dublin

Projects

- Oriel Offshore Windfarm (CP0749).
- Offshore Phase 1 Project 2 (Codling Wind Park) (CP1394).
- Offshore Phase 1 Project 4 (Arklow Bank Wind Park) (CP1396).
- Offshore Phase 1 Project 5 (North Irish Sea Array) (CP1397).
- Offshore Phase 1 Project 7 (Dublin Array) (CP1398).

Description

Codling Wind Park and Arklow Bank are proposed developments of offshore wind farms located off the coast of County Wicklow. North Irish Sea Array and Dublin Array are proposed developments of offshore wind farms located off the coast of County Dublin.

Codling Wind Park is expected to be connected via a new 8-bay enhanced ring 220 kV GIS station located 700m from Poolbeg 220 kV station.

North Irish Sea Array is to be connected via a new C-type 220 kV GIS stations called Bremore located North of Balbriggan to a new 220 kV cable bay in Belcamp 220 kV station.

Dublin Array is to be connected via a new C-type 220 kV GIS station (Jamestown 220 kV station) located 500m from Carrickmines 220 kV station.

Oriel offshore windfarm is to be connected via a C-type GIS station (Oriel 220 kV station) looping into the existing Louth – Woodland 220 V circuit.

The connection method for Arklow Bank Wind Park as well as and the connections from the offshore platforms to the onshore stations for all other projects will be reported in future TDPs when connection offers are completed.

These projects address the following policy objectives:

Sustainability

- Connection and utilisation of renewable energy sources.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP0749	Oriel Offshore Windfarm	New build connection	–	Louth	27/03/2020	31/12/2024	30/06/2027
CP1394	Offshore Phase 1 Project 2	New build connection	–	Wicklow	15/12/2022	31/12/2024	30/06/2027
CP1396	Offshore Phase 1 Project 4	New build connection	–	Wicklow	15/12/2022	31/12/2024	30/06/2027
CP1397	Offshore Phase 1 Project 5	New build connection	–	Dublin	15/12/2022	31/12/2024	30/06/2027
CP1398	Offshore Phase 1 Project 7	New build connection	–	Dublin, Wicklow	15/12/2022	31/12/2024	30/06/2027

Cable replacements in Dublin

Projects

- Finglas – North Wall Cable Replacement (CP1100).
- Carrickmines – Poolbeg 220 kV Cable Replacement (CP1146).
- Inchicore – Poolbeg #1 220 kV Cable Replacement (CP1157).
- Inchicore – Poolbeg #2 220 kV Cable Replacement (CP1150).
- Poolbeg – North Wall 220 kV Cable Replacement (CP1216).

Description

Carrickmines – Poolbeg 220 kV, Inchicore – Poolbeg 220 kV Circuit No. 1 and Inchicore – Poolbeg 220 kV Circuit No. 2 have approximately 14.5 km, 12.5km and 11.3 km long lines, respectively, and are low pressure Self-Contained Fluid Filled (SCFF) cable circuit. The need to replace the existing cables of these circuits is due to their condition and age and a requirement of EirGrid's Cable Maintenance Policy to replace all Fluid Filled cables on the transmission system. This strategy has been communicated to the regulator within PR4 and PR5 submissions. The uprating of these circuits to 570 MVA summer is required in the context of Shaping our Electricity Future.

North Wall – Poolbeg 220 kV and Finglas – North Wall 220 kV circuits are approximately 4.6 km and 11.9 km in length respectively and they are High Pressure Fluid Filled (HPFF) cable circuits in their entirety which means that the cables are contained within a steel pipe and surrounded by insulating fluid. As is the case with other cable replacements described above, the need to replace the existing cables of these circuits it is due to their condition and age, but it is also a requirement of EirGrid's Cable Maintenance Policy to replace all Fluid Filled cables on the network.

These projects address the following policy objectives:

Security of supply

- Ensure safe and reliable operation of the transmission system.

Asset management

- Replacement of ageing cables to meet standardised operational requirements.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP1100	Finglas – North Wall Cable Replacement	Refurbish/ Replace	11.9	Dublin	28/06/2022	19/12/2024	02/07/2029
CP1146	Carrickmines – Poolbeg 220 kV Cable Replacement	Refurbish/ Replace	20	Dublin	16/12/2021	18/12/2025	20/06/2029
CP1150	Inchicore – Poolbeg 2 220 kV Cable Replacement	Refurbish/ Replace	16	Dublin	16/12/2021	18/12/2025	28/09/2029
CP1157	Inchicore – Poolbeg 1 220 kV Cable Replacement	Refurbish/ Replace	18	Dublin	20/12/2021	18/12/2025	02/08/2029
CP1216	Poolbeg – North Wall 220 kV Cable Replacement	Refurbish/ Replace	4.6	Dublin	31/05/2022	19/09/2024	01/12/2028

New generation connections in Dublin Projects

- Corduff FlexGen: connection of a generation facility into Corduff 220/110 kV station (CP1103).
- Mooretown 220 kV Station: increase the MIC at the Huntstown site. Connection Method would be via a new GIS 220 kV 8-bay enhanced ring station, Mooretown 220 kV Station, looped into the existing Finglas–Huntstown B 220 kV Circuit and Corduff–Huntstown A 220 kV Circuit, while also forming two new 220 kV circuits Huntstown A – Mooretown and Huntstown B – Mooretown (CP1183).
- P481 Greener Ideas Profile Park: generation facilities to be connected via a new single bay 110 kV AIS Station tailed to Barnakyle 110 kV via approx. 0.5km of UGC Circuit (CP1256).
- Kilshane Power Station: the generation facility will be connecting via a new single bay 220 kV GIS Station (known as Kilshane) tailed to Cruiserath 220 kV station via approximately 3.5km of UGC (CP1257).

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP1103	Corduff FlexGen	New build connection	–	Dublin	02/04/2020	26/07/2022	19/01/2024
CP1183	Mooretown 220 kV Station	New build connection	–	Dublin	06/04/2022	12/02/2024	01/12/2025
CP1256	Greener Ideas Profile Park	New build connection	–	Dublin	05/05/2022	12/03/2024	02/07/2025
CP1257	Kilshane Power Station	New build connection	–	Dublin	05/05/2022	29/07/2024	01/12/2025

Other approved projects

In addition to the network reinforcement projects described above, there are also other projects in the Southeast, Mideast and Dublin, namely:

- Maynooth – Turlough Hill 220 kV Circuit Power Line Carrier (PLC) Replacement (CP1022).
- Finglas Pantograph Replacement Project (CP1064). The pantographs in the following 5 bays in Finglas 220 kV Station have reached their end-of-life and will be replaced:
  - F2 Corduff 2
  - F3 T2101
  - F4 Belcamp Bay
  - F5 Corduff 1
  - F9 North Wall.
- Physical Security of Transmission Stations, Dublin region (CP1122): design and installation of lighting system, video surveillance at entrances gates in Carrickmines, Dunstown and Woodland; and anti-climb features at Dunstown station entrance.
- Belcamp Land Acquisition: requirement to accommodate potential future grid development (CP1154).
- Ringsend Cable Diversion: this project arose due to a direct conflict between a new 110 kV GIS substation at Ringsend and an existing Poolbeg-Inchicore No. 2 220 kV cable. A diversion of the Ringsend cable circuit is thus required for the proposed construction works of the new Ringsend 110 kV GIS station (CP1287).

These projects address the following policy drivers:

Security of supply

- Ensuring secure operation of the power system by ensuring assets are restored to optimal operating conditions.

Asset management

- Replacement of old protection assets.
- Extending the lifespan of transmission substations by protecting them against climate change effects.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP1022	Maynooth – Turlough Hill PLC Replacement	Refurbish/ Replace	53	Kildare, Wicklow	22/06/2018	06/12/2019	10/07/2025
CP1064	Finglas Pantograph Replacement Project	Refurbish/ Replace	–	Dublin	20/12/2019	12/11/2020	31/10/2025
CP1122	Physical Security of Transmission Stations – Dublin Region	Other	–	Dublin	01/09/2020	08/12/2023	30/12/2025
CP1154	Belcamp Land Acquisition	Other	–	Dublin	19/11/2020	16/02/2024	[52]
CP1287	Ringsend Cable Diversion	Other	–	Dublin	15/10/2023	29/03/2024	[52]

52 As of the data freeze date, the energisation date is not publicly available at this time.

5.5 Projects at multiple locations

Summary of projects

Project category	No. of projects
Uprate/Modify	3
Refurbish/Replace	8
Other	4
Total	**15**

Active TDP projects by region

These projects span various regions of the country and do not fit neatly in the categorizations highlighted in previous sections. They encompass physical security of the transmission network, upgrades of protection equipment across several substations, optimizing asset maintenance, among others.

Physical security of transmission stations

Projects

- Physical Security of Transmission Stations – South Region (CP1123).
- Physical Security of Transmission Stations – North Region (CP1124).
- Physical Security of Transmission Stations – Central Region (CP1125).

Description

The physical security of transmission stations the in south, central and north regions are driven by security of supply. These projects are necessary to address a significant number of copper earth conductor thefts. Those thefts of earth conductors impose a risk to intruders of injury or death, TSO and TAO staff as well as safety and operational risks to the transmission system.

Security of supply

- Ensuring secure operation of the power system by ensuring assets are physically secure.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP1123	Physical Security of Transmission Stations – South Region	Other	–	Wicklow, Wexford, Cork, Tipperary, Waterford	07/05/2021	08/12/2023	31/03/2026
CP1124	Physical Security of Transmission Stations – North Region	Other	–	Louth, Meath, Cavan, Roscommon, Monaghan	11/06/2021	08/12/2023	30/12/2025
CP1125	Physical Security of Transmission Stations – Central Region	Other	–	Kildare, Carlow, Cork, Kilkenny, Limerick, Wicklow	14/07/2021	08/12/2023	30/12/2025

Transmission stations and equipment protection uprates and upgrades Projects

- Transformer Protection Upgrade, 6 Stations (CP1096).
- Newbridge – Cushaling 110 kV line, Station Bay Conductors and Lead-in Conductor Uprate (CP1149).
- Agannygal, Ennis and Connected Stations 110 kV Protection Upgrade (CP1186).
- Cashla and Connected Stations 220 kV and 110 kV Protection Upgrade (CP1227).
- Shannonbridge and Connected Stations 220 kV and 110 kV Protection Upgrade (CP1228).

Description

In recent years, the amount of renewable generation connected to medium voltage networks has increased significantly, resulting in 110 kV transformers at Sligo, Corderry, Dalton, Macroom, Ikerrin and Somerset becoming net exporter transformers.
As a result, the existing protection schemes in these stations are no longer suitable. Therefore, refurbishments of these stations are progressing through our six-step process for developing the grid and to support the needs for power-transfer capacity.

Protection upgrades are driven by security of supply. There are three station protection upgrades projects that involve the installation/ replacement of protection equipment based on the age profile of the devices and to mitigate against sub optimal protection system performance. Protection system enhancement works are also included in all of them to ensure compliance with the best practice in transmission system protection.

The works of Newbridge – Cushaling 110 kV are part of wider site-related connection equipment works being carried out to allow for the connection of a new wind farm at Cloncreen, Co. Offaly, which would see the development of a new Kilcumber 110 kV substation connected to Cushaling 110 kV station. This project involves the uprating of the Newbridge 110 kV bay conductor, in Cushaling 110 kV station, the Cushaling 110 kV bay conductor, in Newbridge 110 kV station and the Cushaling 110 kV lead-in conductor and Newbridge 110 kV station to achieve a higher rating.

These projects address the following policy objectives:

Security of supply

- Enhancing increased utilization and transfer of renewable generation capacity across the island.

Asset management

- Replacement of protection equipment to ensure a safe, secure system operation.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP1096	Transformer Protection Upgrade, 6 Stations	Refurbish/ Replace	–	Sligo, Mayo, Leitrim, Tipperary, Galway, Cork	10/02/2020	02/10/2020	30/11/2025
CP1149	Newbridge – Cushaling 110 kV Line, Stations Bay Conductors and Lead-in Conductor Uprate	Uprate/ Modify	–	Kildare, Offaly	22/01/2021	04/11/2021	10/11/2025
CP1186	Agannygal, Ennis and Connected Stations 110 kV Protection Upgrade	Refurbish/ Replace	–	Offaly. Galway. Clare	05/08/2021	08/09/2022	31/12/2025
CP1227	Cashla and Connected Stations 220 kV & 110 kV Protection Upgrade	Refurbish/ Replace	–	Galway, Clare	02/02/2022	21/09/2022	30/11/2026
CP1228	Shannonbridge and Connected Stations 220 kV & 110 kV Protection Upgrade	Refurbish/ Replace	–	Offaly, Roscommon, Tipperary	03/02/2022	26/09/2022	30/11/2026

Reinforcement of the Transmission System in the Midlands

Projects

- Cushaling – Newbridge 110 kV Thermal Uprate (CP1002).
- Maynooth-Derryiron-Timahoe 110 kV Line Uprate (CP1391).

Description

Significant levels of new renewable generation have connected and are in the process of connecting to the transmission and distribution system in the Midlands. This introduces large power flows at times of high wind generation output and will lead to violation of the Transmission System Security and Planning Standards (TSSPS). An increase of thermal capacity of the Cushaling – Newbridge 110 kV circuit is required to avoid the circuit exceeding its thermal rating.

The Derryiron – Maynooth 110 kV circuit is, in the same vein, at risk of large power flows due to the connection of renewable generation in the Midlands. Following the looping in of the Timahoe 110 kV station into the existing Derryiron – Maynooth 110 kV circuit, Derryiron – Timahoe and Maynooth – Timahoe 110 kV circuits will be created. Additionally uprating this circuit will help facilitate the increased utilization of renewable energy in that region.

These projects address the following policy objectives:

Sustainability

- Facilitating increased usage of renewable energy especially during peak wind generation periods.

Security of supply

- Ensuring secure operation of the power system.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP1002	Cushaling – Newbridge 110 kV Thermal Uprate	Uprate/ Modify	24.6	Kildare, Offaly	30/03/2023	19/12/2025	30/11/2029
CP1391	Maynooth-Derryiron-Timahoe 110 kV Line Uprate	Uprate/ Modify	43.2	Kildare, Offaly	05/04/2023	30/09/2025	08/11/2029

Other Projects

- Paint Towers Nationwide (CP0857).
- Transformer Restoration Project (CP1182): this project shall address corrosion problems and restore the condition of fourteen (14) transformers located across eleven (11) different transmission stations as outlined below. The transformers are midway through their fifty-year expected lifespan, so, this early restoration (including bushing replacement and bay refurbishment works at the high and low voltage sides of each transformer) is required to ensure the expected asset life is achieved. Table 5-5 shows the list of the transformers being restored.

Table 5-5: Transformers to be restored in CP1182

S/N	Station	Transformer
1	Aghada	T2102
2	Cashla	T2102
3	Clashavoon	Spare
4	Cullenagh	T2101
5	Gorman	T2102
6	Kellis	T2101
7	Kellis	T2102
8	Louth	AT1
9	Louth	T2102
10	Louth	T2104
11	Maynooth	T2102
12	Shannonbridge	T2102
13	Srananagh	T2102
14	Woodland	T4202

- Climate Change Adaptation Measures (CP1300): following a detailed climate risk assessment of the Irish Transmission system, a big risk to the transmission system has been identified as flooding arising from river or drainage system infrastructure capacity exceedances, storm surges, sea level rise and extreme precipitation levels. Five (5) stations have been progressed for detailed assessment and various improvement works will be undertaken in them. They include: Dungarvan 110 kV, Flagford 220 kV, Marina 110 kV, Shannonbridge 220 kV and Tarbert 220 kV stations.
- Strategic Spares for OHL, Stations and Cables (CP1304): this project was created to improve the efficiency in maintenance operations, optimizing asset performance, reducing business risk and providing a reliable solution for maintaining various asset on the transmission network.
- Sprecher and Schuh Circuit Breaker replacement (CP1250): there are twenty-one (21) 110 kV Sprecher and Schuh circuit breakers located at twelve (12) stations on the transmission system. These circuit breakers were manufactured in the 1960's and 1970's with most of them either approaching end of life or past end of life. The maintenance history of the identified circuit breakers within this project highlights operational restrictions, unreliability, moisture ingress, lack of spare parts and unavailability of Original Equipment Manufacturer (OEM) support all of which pose a threat to the security of the Transmission System hence, their replacement. Table 5-6 below identifies the circuit breakers to be replaced.

Table 5-6: Circuit breakers to be replaced in CP1250

S/N	110 kV Station	Bays	Construction year
1	Castlebar	Castlebar T142 110 kV Cubicle	1969
2	Cow Cross	Cow Cross Old Court 2 Cubicle Old Court 1 Cubicle T142 110 kV Cubicle Spare Cubicle Castleview Cubicle Raffeen Cubicle Whitegate Cubicle	1976 1976 1976 1979 1976 1976 1964
3	Dungarvan	Dungarvan T141 H3 110 kV Cubicle T142 H4 110 kV Cubicle	1968 1995
4	Griffinrath	Griffinrath Grangecastle Maynooth T141 Cubicle	1974
5	Knockearagh	Knockearagh T141 H3 110 kV Cubicle	1963
6	Macroom	Macroom Clashavoon 2 Cubicle	1971
7	Mallow	Mallow T142 H4 110 kV Cubicle	1963
8	Marina	Marina Spare Cubicle	1975
9	Midleton	Midleton T141 H3 110 kV Cubicle	1966
10	Newbridge	Newbridge T141 110 kV Cubicle	1965
11	Rathkeale	Rathkeale Kilpaddoge Cubicle T141 110 kV Cubicle T142 110 kV Cubicle	1971 1968 1977
12	Tralee	Tralee T141 H1 110 kV Cubicle	1964

These projects address the following policy drivers:

Security of supply

- Ensuring secure operation of the power system by ensuring assets are adapted and restored to optimal conditions.

Asset management

- Extending the lifespan of transmission substations by protecting them against climate change effects.
- Replacement of old protection equipment.
- Improvement of maintenance efficiency for transmission assets.

CP No.	Project title	Type	km	Location	GW3 (CA)	GW6 (PA)	Energisation
CP0857	Paint Towers Nationwide	Refurbish/ Replace	–	Dublin, Wicklow, Louth, Cork, Kildare, Meath, Kilkenny, Offaly, Carlow	17/02/2014	24/11/2014	31/10/2026
CP1182	Transformer Restoration Project	Refurbish/ Replace	–		31/03/2023	25/07/2024	30/11/2029
CP1250	Sprecher and Schuh Circuit Breaker Replacement	Refurbish/ Replace	–		09/10/2023	12/12/2024	14/03/2030
CP1300	Climate Change Adaptation Measures	Other	–		05/04/2023	30/09/2025	
CP1304	Strategic Spares for OHL, Stations and Cables	Refurbish/ Replace	–		08/03/2023	28/03/2024	

6. Projects in early stages of development

In Chapter 5, we outlined committed projects as at the data freeze date, 31st January 2024. Committed projects are those projects that are in Steps 4-6 of our six-step process for developing the grid. Committed projects have received EirGrid capital approval which occurs at the end of Step 3.

6.1 Overview

In this chapter we outline the projects that are in the early stages of development, that is, in Steps 2-3 at the time of the data freeze date[53]. As these projects progress and get EirGrid capital approval they will move into Steps 4-6.

The tables below show drivers and locations. Although it is not usual for drivers to change once established, in certain circumstances they may change as projects progress through the early stages of the framework and therefore the information in this chapter should not be considered definitive.

Additional projects will be included in future TDPs as the needs identified in the Tomorrow's Energy Scenarios System Needs Assessment, candidate solutions and reinforcements identified in Shaping Our Electricity Future and customer connections are brought through our six-step process for developing the grid.

Network studies performed as part of Shaping Our Electricity Future have identified several additional reinforcements that are required to meet a target of 80% RES-E by 2030, including connection of 5 GW of offshore wind capacity. Twenty-two (22) candidate solutions and sixteen (16) additional candidate reinforcements were identified in SOEF v1.0 and SOEF v1.1 respectively. Some of these reinforcements are required to address the needs associated with offshore wind connections along the east coast and increased demand growth in Dublin.

In addition, renewable hubs are being developed by EirGrid. EirGrid and ESB Networks, in their capacity as TSO and DSO respectively, provided the CRU with a joint Position Paper EirGrid Position Paper on Generation Connection Policy regarding 'Renewable Hubs Pilot' in June 2023[54]. The connection reforms introduced under the Pilot may serve as guidance for development of ECP-3 with possible opportunity for further engagement as the Hubs progress.

Subject to engagement and further detailed technical analysis, these developments and reinforcements will be included as appropriate in future TDPs as they are brought through our six-step grid development process.

53 As per Regulation 8(6) of Statutory Instrument (SI) No. 227 of 2022 as amended.
54 https://cruie-live-96ca64acab2247eca8a850a7e54b-5b34f62.divio-media.com/documents/CRU2023131_Renewable_Hubs_Pilot_Decision_1.PDF

6.2 The Border, Midlands and West

Thermal transmission network needs relating to the transfer of power across the existing network in the Northwest of the island are currently under assessment. The needs under assessment were previously highlighted in both TES 2019 and SOEF (v1.0 and v1.1).

EirGrid has adopted scenario-based planning to help develop a transmission network that takes future uncertainty into account. In line with our statutory obligation the future scenarios are analysed to establish that the transmission system complies with the Transmission System Security and Planning Standards (TSSPS). If the system is in breach of any of these standards the issue must be addressed and a solution identified.

We have confirmed the need for further investment in this region. Table 6-1 shows the projects progressing through the early stages of our six-step process for developing the grid. Feasibility studies are currently on-going for these two projects. These studies will identify the emerging best performing solution options which, if confirmed following public and stakeholder consultation, will become committed projects in this region and progressed through the later stages of the Framework for Grid Development, i.e., Steps 4 to 6.

From TDP 2023, two of the reported projects (CP1002 and CP1003) have been committed and reported in Chapter 5.

Table 6-1: Projects in early stages in Border, Midlands and West

	CP No.	Project title	km	Drivers			Location
				Security of supply	Sustainability	Asset management	
1	CP0982	Flagford Sligo Capacity Needs	50.5	■	■		Roscommon, Sligo
2	CP1233	Donegal – Srananagh Corridor			■		Donegal, Leitrim, Sligo

CP1233 Donegal – Srananagh Corridor Capacity Needs is a new project in the North-West. It is important to note that there was a previous proposal for the area called the Renewable Integration Development Project (RIDP). RIDP was a proposal for a programme of network development projects to help integrate renewable energy in the Northwest of the island of Ireland. The network developments included new circuits in Ireland, Northern Ireland and a cross border circuit. One element of RIDP had capital approval, i.e., CP0800 Northwest Project. The need for CP0800 and the potential solution and technology options were reviewed in line with our grid development strategy and six step process for developing the grid and in the context of Tomorrow's Energy Scenarios and the subsequent Shaping our Electricity Future (SOEF) consultation and analysis. SOEF has identified that the need for new network development in the Northwest of Ireland, between Srananagh substation and county Donegal, remains. However, the scope of the plausible scale of solutions has changed to include additional technologies and to include investigation of connection to a number of substations in Donegal. Consequently, CP0800 was terminated and CP1233 started. Additional reinforcements will be necessary in Donegal, particularly in the corridor north of Clogher 110 kV station.

6.3 The Southwest and Midwest

Integration of renewable energy and import of power from Celtic and Greenlink interconnectors are driving the main feasibility studies in this area. Power import scenarios from Celtic and/or Greenlink interconnector introduces large power flows from the southern part of the network towards the midlands.

The continuing connection of renewable generation in the Southwest increases power flows on the transmission system leading to assessment in the area to identified future violations of the Transmission System Security and Planning Standards (TSSPS). Those TSSPS violations will materialise as thermal capacity violations.

EirGrid is also assessing asset intervention options in those regions. This is based on asset condition and performance to determine appropriate strategies that will lead assets maintenance, refurbishment, partial or full replacement. It is important to highlight that EirGrid is committed to making best use of existing assets before considering investing in new assets.

We have confirmed the need for further investment in this region. Table 6-2 shows the project progressing through our six-step process for developing the grid.

Table 6-2: Project in early stages in Southwest and Midwest

	CP No.	Project title	km	Drivers			Location
				Security of supply	Sustainability	Asset management	
1	CP1004	Killonan – Limerick No 1 110 kV Line Refurbishment		■		■	Limerick
2	CP1177	Whitegate 110 kV Station Refurbishment Project		■		■	Cork
3	CP1302	Killonan Shannonbridge 220 kV Line Refurbishment		■		■	Limerick, Offaly
4	CP1310	Agannygal-Ennis Line Refurbishment		■		■	Clare
5	CP1389	Limerick – Rathkeale Line Refurbishment	–	■			Meath

6.4 The Southeast, Mideast and Dublin

The East coast, Dublin and Kildare part of the transmission system will play an important role in meeting Government's renewable electricity targets for 2030. The region accommodates large demand and must be capable of accommodating various power flows from existing and planned power sources surrounding the area. The regions near the east coast phase 1 offshore wind generation projects and interconnectors are key drivers for reinforcements.

The Shaping Our Electricity Future roadmap highlighted the need to progress development of transmission interface stations with the Distribution System Operator (DSO) in the Dublin region. These interface stations are also called Bulk Supply Points (BSP) and are essential for accommodating forecasted growth of electricity demand in the distribution network. It is important to note that these BSP are not just stations – they will also require high voltage transmission circuits to connect them into the wider network.

Line condition assessments (LCAs) have also been carried out in these regions and expected refurbishment works will be reported in future version of the Transmission Development Plan.

We have confirmed the need for further investment in this region. We are progressing the following investments shown in Table 6-3 through our six-step process for developing the grid:

Table 6-3: Projects in early stages in Southeast and Mideast and Dublin

	CP No.	Project title	km	Drivers			Location
				Security of supply	Sustainability	Asset management	
1	CP1121	Arklow-Great Island-Lodgewood 220 kV Line Refurbishment	–	■		■	Wexford, Wicklow
2	CP1196	Arklow – Ballybeg – Carrickmines 110 kV Capacity Needs	21.9	■			Wicklow, Dublin
3	CP1214	North County Dublin Bulk Supply Point and Associated New Transmission Circuit	–	■			Dublin
4	CP1226	South Dublin Reinforcement Combined with West County Dublin Bulk Supply Point (BSP)	25	■			Dublin
5	CP1273	Dublin Central Bulk Supply Point	–	■			Dublin
6	CP1301	Dundalk – Louth 110 kV Line Uprate	–	■		■	Louth
7	CP1312	Athy – Carlow 110 kV Circuit 1	25	■		■	Kildare, Carlow
8	CP1319	Blake – Maynooth – Newbridge Refurbishment	–	■		■	Kildare, Dublin
9	CP1325	Corduff – Mullingar Partial Line Uprate	–	■		■	Dublin
10	CP1402	Platin Station Refurbishment	–	■		■	Louth

7. Summary of environmental appraisal

An Environmental Appraisal Report (EAR) has been prepared as an accompanying document to this Transmission Development Plan. The purpose of the EAR is to ensure the TDP 2024-2033 is in line with committed Strategic Environmental Objectives (SEOs). These objectives are set out in the Strategic Environmental Assessment (SEA) prepared for the Grid Implementation Programme (IP) 2023-2028 and integrated into the overall approach to grid development.

A series of environmental, planning, social and technical policies and objectives form a core element of the Grid IP and guide sustainable grid development and the SEA and AA processes integrated mitigation into these policies and objectives. The five-year cyclical process during which annual EARs assess TDPs for SEA compliance are set out in Figure 7-1.

As outlined earlier, this TDP describes forty-three (43) new projects that received capital approval and were added to ongoing projects in 2023. Additionally, three (3) projects were added from the previous TDP because they received Capital Approval after the data freeze date in TDP 2023. No new offshore transmission or interconnector projects were added since the 2023 TDP. The changes since TDP 2023-2032 are detailed in Chapter 3.

The additional projects consist of new build projects, refurbishment/replacement projects, uprate/modification projects and a single climate change adaptations project. These projects are examined in the EAR and evaluated against the SEOs. Following the implementation of the mitigation measures adopted during the SEA and AA processes, the SEOs will be achieved.

Therefore we consider TDP 2024-2033 to be in accordance with the provisions of the Strategic Environmental Obligations as set out in the Grid IP 2023-2032 and associated SEA Environmental Reporting.

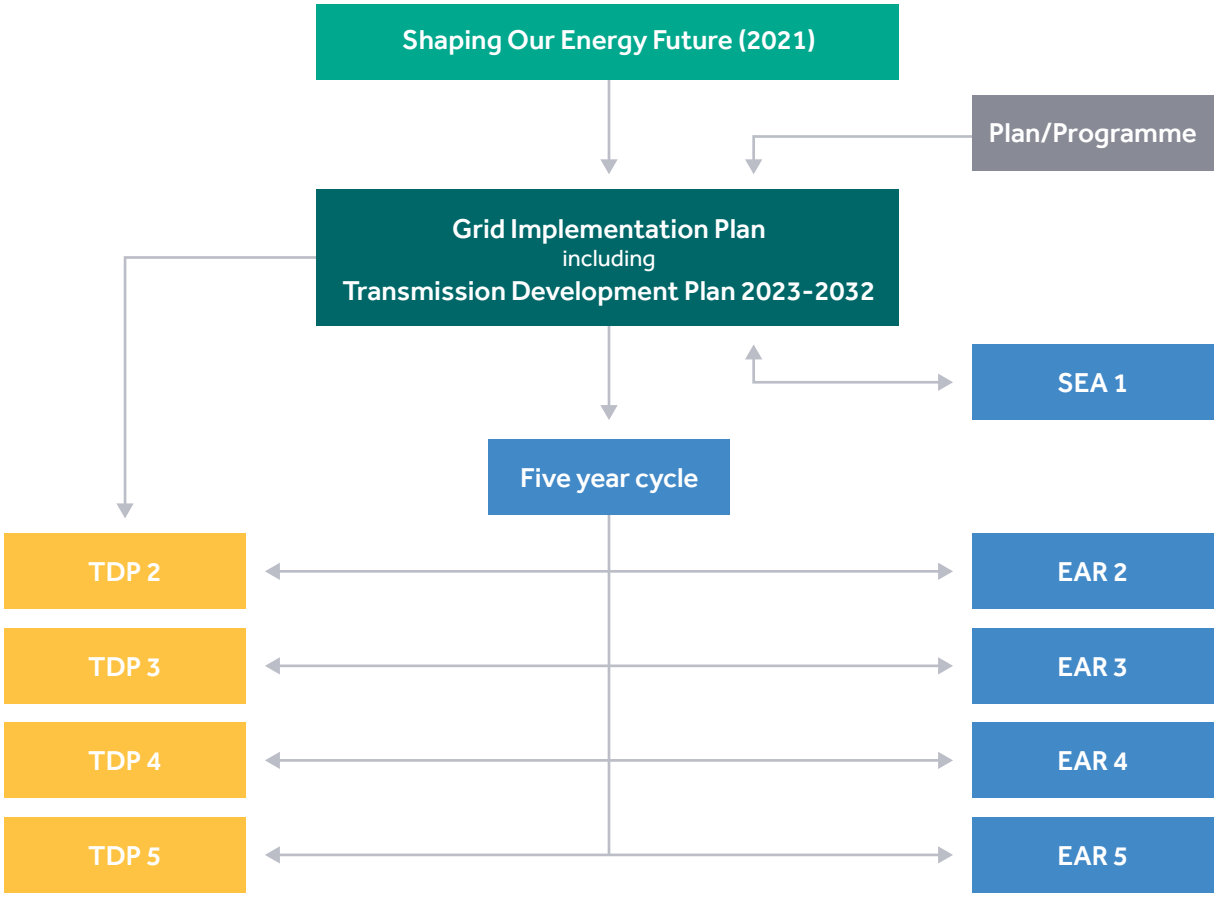
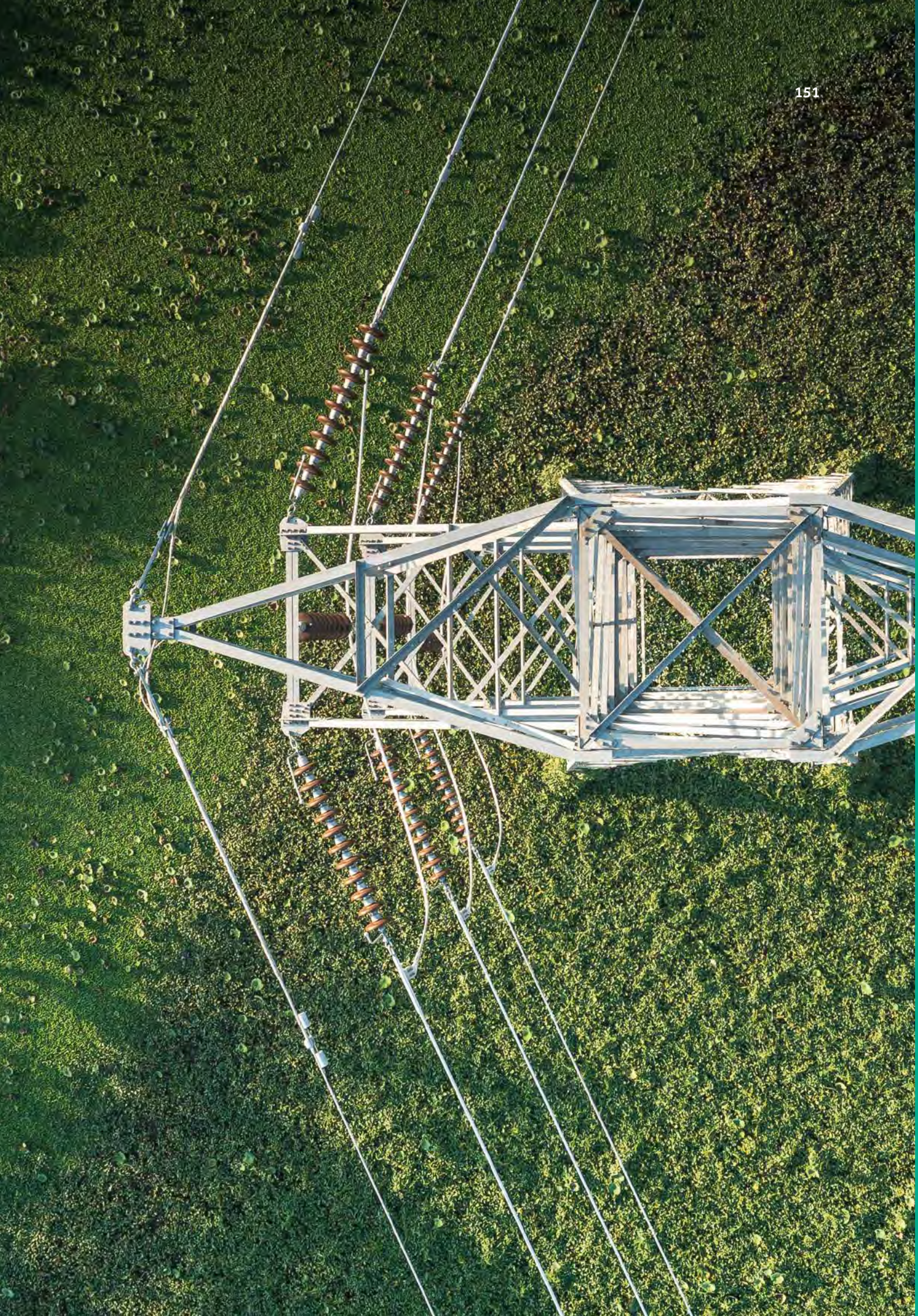


Figure 7-1: Five year lifecycle of SEA and subsequent annual environmental appraisals



Appendix A:
Irish projects in European plans

The TYNDP process consists of four main stages, for which reports are drafted and consultations are managed by ENTSO-E. The TYNDP process is shown in Figure A-1 and further information can be found on the ENTSO-E website[55].

How are Irish transmission projects included in ENTSO-E's TYNDP?

Scenarios are developed to describe how the future energy landscape is to function within the transmission system, defining potential future developments of the energy system that are used to gain insight on how these projects will benefit the transmission system.

During the Collection of Projects stage, ENTSO-E invites operators and project promoters to propose projects requesting to be considered as PCI and included in ENTSO-E's TYNDP. The Identification of System Needs assesses the impact of the Scenarios on the transmission system, identifying network bottlenecks and additional investment needs through the outcomes provided by network power-flow, stability and market analyses studies. In the Cost-Benefit Analysis, ENTSO-E reviews the benefits and costs of electricity transmission and storage projects from a pan-European perspective before the European Commission includes them as PCI (Projects of Common Interest).

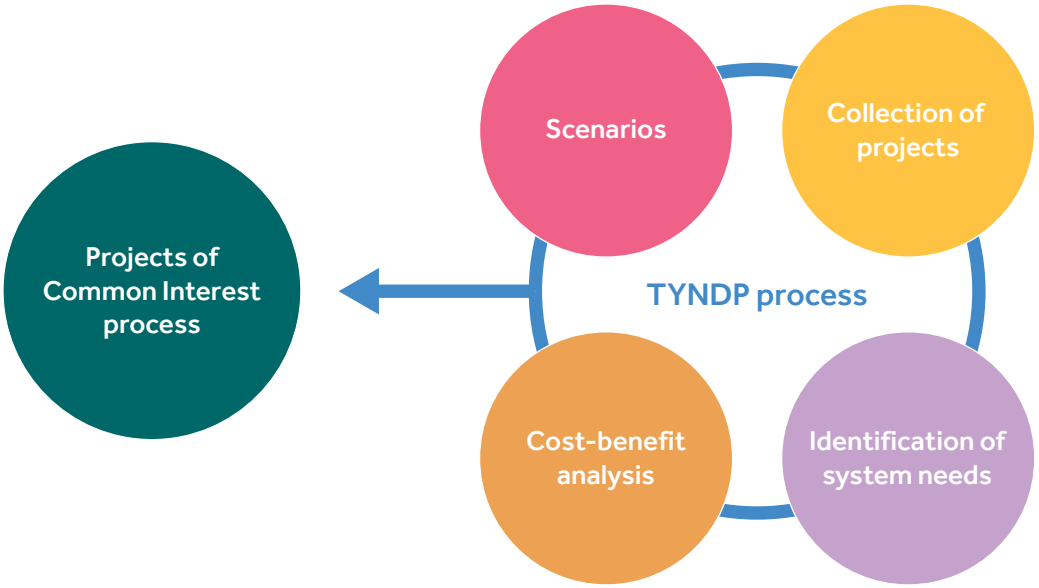


Figure A-1: Overview of the assessment process inside the TYNDP and for identifying PCIs

55 https://tyndp.entsoe.eu/

The needs for reinforcement of the transmission network are first identified. Solutions to satisfy these needs are then identified and then assessed relative to each other, taking into consideration their respective costs and benefits to the system throughout the lifecycle of the project. When a solution has been chosen, it is included in the National Development Plan, which describes planned investments in the national transmission network. This includes construction of new infrastructure and replacement of existing infrastructure.

Projects that integrate at least two EU countries may come under European PCI status. These projects are intended to help the EU achieve climate and energy objectives.

The TEN-E Regulation, enacted in June 2022, includes provisions for Projects of Mutual Interest (PMIs) between EU member states and third countries. Projects that integrate EU and non-EU countries may come under Projects of Mutual Interest (PMIs). These projects are intended to be a cross-border energy infrastructure projects which contribute to the energy and climate policy objective of the Union.

Following the preliminary design, a technical project definition is created. This includes deciding a route and considering environmental and social constraints. Administrative permits are also required before a project can commence. Public consultation is required before a permit can be granted. Funding for transmission projects can come from public or private investors and projects with PCI status are eligible for EU funding under the Connecting Europe Facility.

Following construction, a testing phase is required before the project can be commissioned. If any equipment is unavailable during construction or maintenance of a project, a planned outage must be coordinated with the relevant TSO(s). The final step in a transmission project is analysis of its impact on system operations and markets once operational. This will determine whether the benefits anticipated during planning have been realised.

Context of TYNDP 2022

The 2024 Ten-Year Network Development Plan is currently undergoing collection of projects, thus, the TYNDP 2022 report which was published in the third quarter of 2023 will be referred in this version of the TDP.

Considering the feedback received on the 2020 edition, for the first time in TYNDP 2022, ENTSO-E collected feedback from stakeholders on key proposed improvements in the draft Cost-Benefit Analysis Implementation Guidelines, including the inclusion of the Interlinked Model, a new methodology to assess hybrid interconnectors and the assessment of projects' commissioning years. The consultation was open to all interested stakeholders from 16th December 2022 until 1st February 2023.

In October 2021, ENTSO-E invited promoters of transmission and storage infrastructure projects to submit their projects to the TYNDP 2022, ENTSO-E's pan-European network development plan. ENTSO-E performed a cost-benefit analysis on selected projects and released the draft TYNDP 2022 for public consultation between July and September 2022.

EirGrid projects in TYNDP 2022

Table A-1 below lists the projects we proposed to be in ENTSO-E's 2022.

Table A-1: EirGrid projects in European TYNDP 2022

TYNDP No.	Project title
107	Ireland – France Interconnector (Celtic Interconnector)

Third party projects in TYNDP 2022

Table A-2 below lists the Irish projects proposed by third parties to be in ENTSO-E's TYNDP 2022.

Table A-2: Third party projects in European TYNDP 2022

TYNDP No.	Project title
286	Greenlink Interconnector
349	MaresConnect
1025	Silvermines Hydroelectric Power Station
1082	Sea Socket[56]

56 As reported in the draft TYNDP 2024 project portfolio, this project is expected to be removed.

Irish Projects of Common Interest (PCIs)

The European Commission (EC) oversees the designation of Projects of Common Interest[57] (PCI). The PCI selection is a process separate from the TYNDP process.

However, to be eligible for PCI status, inclusion in the last available TYNDP is an explicit condition. Table A-3 below lists the Irish PCIs on the sixth PCI list. The sixth list was published by the European Commission in November 2023 and is available online[58] and reported in this TDP.

Table A-3: Irish Projects of Common Interest in TYNDP 2022

PCI No.	TYNDP No.	Project title
1.3	107	Ireland – France Interconnector (Celtic Interconnector)
1.13	1025	Silvermines Hydroelectric Power Station

Irish e-Highway 2050 project

The e-Highway2050 project is a study project funded by the EC aimed at building a Development Plan for the European transmission network from 2020 to 2050[59].

The Development Plan supports the EU's overall policy objectives regarding energy and decarbonising the European economy. Table A-4 below lists the Irish project included in the e-Highway 2050 Plan. This e-Highway project is also identified as such in the fifth PCI list referred to above.

Table A-4: Irish Projects in e-Highway 2050 Plan

PCI No.	TYNDP No.	Project title
1.3	107	Ireland – France Interconnector (Celtic Interconnector)

57 https://energy.ec.europa.eu/topics/infrastructure/projects-common-interest_en
58 https://energy.ec.europa.eu/publications/annex-first-union-list-projects-common-and-mutual-interest_en
59 PCI-PMI transparency platform (europa.eu)

How are Irish and European plans related?

It is worth highlighting how the Irish TDP and the European plans and designations are related. Figure A-1 below illustrates the relationship.

Only high voltage projects that involve a large increase in transmission capacity are included in European plans. Of those only a small number of large cross border projects which increase the import and/or export capability of ENTSO-E countries are designated Projects of Common Interest.

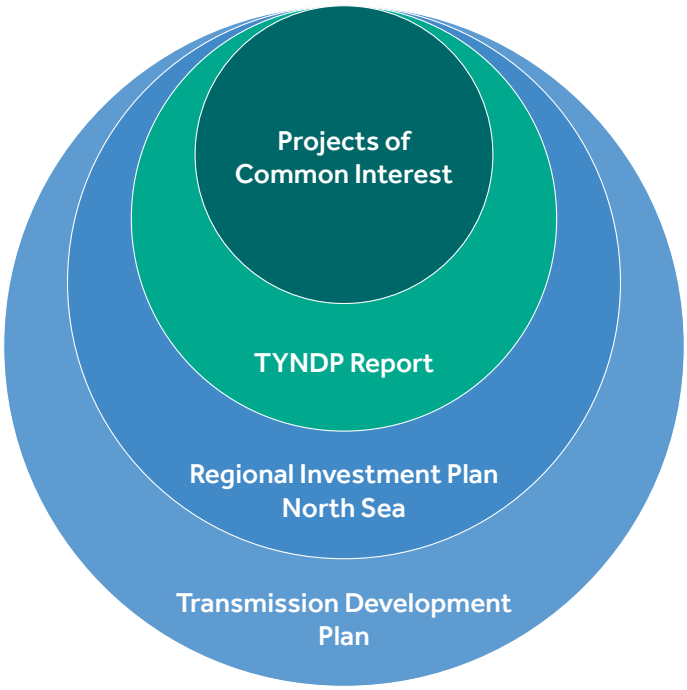


Figure A-2: Relationship between Irish and European plans

Appendix B: Approach to grid development

As TSO, we are obliged to develop a safe, secure, reliable, economical and efficient transmission network to meet all reasonable demands for electricity, in accordance with legal obligations.

Development objectives and strategies

We plan the development of the transmission network taking account of the needs of the transmission system and by assessing long-term future network performance against technical standards. These technical standards are detailed in the Transmission System Security and Planning Standards[60,61] (TSSPS). When it is established that changes on the network cannot be accommodated without violating the performance standards, a range of issues are considered when selecting a transmission reinforcement strategy.

When assessing development options to address future potential network needs, we use our six-step process for developing the grid. Within the six-step process, we consider the impacts of each possible option on other potential development needs. Sometimes by making more effective use of the existing network, we can avoid the need for additional circuits.

In some cases, a proposed project may meet more than one development requirement, prove more economic and have less impact on the environment than multiple projects. Where possible, we seek to find single development projects to meet multiple network requirements.

Public planning and environmental considerations assist in the development of transmission infrastructure projects. An overview of the public planning and environmental considerations, as well as the TSSPS can be found below.

The Transmission System Security and Planning Standards (TSSPS)

The requirement for network development is identified when the simulation of future conditions indicates that the TSSPS would be breached. These standards are deterministic[62] – as are those generally used throughout the world in transmission planning. They set out an objective standard which delivers an acceptable compromise between the cost of development and service delivered. Rather than conducting subjective benefit analysis in each case, it is preferable to plan to meet an objective standard and carry out analysis of the options available to meet the standard.

60 EirGrid-Transmission-System-Security-and-Planning-Standards-TSSPS-Final-May-2016-APPROVED.pdf
61 Previously referred to as the Transmission Planning Criteria.
62 The deterministic methodology is often referred to as the N-1 criterion. The system must have sufficient capacity so that in the event of a probable system outage, there are no resulting system problems such as overloading, under-voltage, over-voltage or instability.

Public planning and environmental considerations

Overview

We have a team of experienced, professional planning and ecological consultants in our Infrastructure Directorate. These consultants assist in the development of transmission infrastructure projects and in other aspects of network development from a planning and environmental perspective. This section provides an overview of the approach taken on individual projects, considering best practice and legal requirements. In addition, Section B.3.4 outlines our approach to Strategic Environmental Assessment (SEA) for Grid Implementation Plans. These plans are based on broader strategy approaches to grid development but include aspects of any relevant Transmission Development Plans. A Strategic Environmental Assessment will accompany this TDP to ensure that it is in accordance with the provisions of the Strategic Environmental Objectives detailed in the SEA for the Grid Implementation Plan.

Public planning considerations

Statutory consent for transmission projects is sought on a project-by-project basis, as required under the Planning and Development Acts. At the outset, our public planning specialists determine whether permission is needed for a proposed development or whether, under the current planning and development legislation, such works may comprise exempted development – that which does not require a prior grant of approval or permission. These might include line uprate projects, whereby the capacity or rating of electrical equipment is increased, refurbishment and maintenance works.

We undertake a process to confirm our consideration of the exempted status of such works. This process also involves Screening for Appropriate Assessment (AA), which is a statutory obligation under Article 42 of the European Communities[63] Regulations 2011-15. Where it is determined that planning permission is required, we engage with An Bord Pleanála (ABP) which determines if a proposed development falls within the scope of Section 182A of the Planning and Development Acts 2000 to 2014, which relates to Strategic Infrastructure Development (SID). If it does fall within Section 182A, an application for approval is made directly to the Strategic Infrastructure Division of ABP. If ABP determines that the proposal does not fall within Section 182A, it directs us to make an application for permission to the relevant Local Planning Authority (LPA).The decision-making authority (ABP or LPA) will determine whether the application for development is in accordance with the principles of proper planning and sustainable development. Considerations in this regard include:

- EU directives and governing statutory and strategic policy.
- Conformity with the provisions of key documents such as relevant development plans and Regional Planning Guidelines.
- Input from prescribed bodies, such as the:
  - Relevant LPA (if the decision-maker is ABP).
  - Environment, Climate and Communications.
  - Housing, Local Government and Heritage.
- Requirements to protect designated areas on account of their ecological, cultural, archaeological, visual, or other sensitivity and/or significance.

63 Birds and Natural Habitats

Environmental considerations

The requirements for Environmental Impact Assessment (EIA) and Appropriate Assessment (AA) are transposed into Irish law in the Planning and Development Acts and associated regulations. Where necessary, applications for statutory consent are accompanied by an Environmental Impact Assessment Report (EIAR) – the need for a statutory EIAR is informed by way of an EIA Screening report. Similarly, screening for the need for AA for impacts on European sites, designated Special Conservations Areas (SAC) or Special Protection Areas (SPA), is routinely undertaken for all our grid projects.

Environmental Impact Assessment (EIA)

Projects where EIA is mandatory are identified on Annex I of the EIA Directive (2014) and in Irish legislation under the Planning and Development Acts and relevant regulations. For transmission infrastructure, this includes transmission of electricity by overhead lines where:

- The voltage is 220 kV or more: and
- The circuit length is more than 15 km.

An EIAR may be required for sub-threshold development where likely significant impacts on the environment are identified by the relevant LPA or ABP. The content and scope of the EIAR is defined by the EIA Directive (2014). However, detail varies between projects depending on local environmental sensitivities.

Appropriate Assessment (AA)

In accordance with the provisions of Article 6 (3) of the EU Habitats Directive, any plan or project not directly connected to a Natura 2000 site (Special Area of Conservation (SAC) or Special Protection Area (SPA)), that is likely to have a significant effect on the site is subject to Appropriate Assessment (AA) of its implications on the site.

The requirements for AA are set out in:

- Article 6 (3) of the EU Habitats Directive (92/43/EEC).
- The European Communities (Birds and Natural Habitats) Regulations 2011-2015.
- Part XAB of the Planning and Development Act.

Both the habitats and birds' directives have been fully transposed into Irish law. The provisions of Part XAB of the Planning and Development Act require, among other things, that an AA "shall include a determination by the competent authority under Article 6.3 of the Habitats Directive as to whether or not a proposed development would adversely affect the integrity of a European site."

The overall AA process is different from EIA as it is only focused on the conservation objectives of European sites. The process is made up of separate stages of assessment, the results of each stage determining the need for the next.

It should be noted that EirGrid has responsibility for screening projects that we wish to undertake. In accordance with Regulation 42(1) of the European Communities (Birds and Natural Habitats) Regulations 2011 as amended, EirGrid is required to screen for the need for AA of plans and projects it wishes to undertake or adopt to assess in view of best scientific knowledge and the conservation objectives of the site(s), if individually or in combination with other plans or projects is likely to have a significant effect on a European site(s).

Strategic Environmental Assessment

Strategic Environmental Assessment (SEA) is a systematic process of predicting and evaluating the environmental effects of a proposed plan or programme to ensure that these effects are adequately addressed at the earliest stage. The EU Directive (2001/42/EC) on the Assessment of Effects of Certain Plans and Programmes on the Environment (more usually referred to as the SEA Directive) sets out the types of plans (such as sectoral plans, including energy) that may require formal SEA. To date EirGrid has prepared two SEAs for Grid Implementation Plans which set out the way grid projects will be developed in line with the overarching Grid Development Strategy.

The purpose of the SEA is to ensure that environmental considerations form part of the preparation of plans and programmes before their completion. It aims to provide a high level of protection for the environment and to promote sustainable development.

The Grid Implementation Plans and associated SEA have a nominal five-year lifespan. Shortly, EirGrid will approve the 2023-2028 Grid IP and SEA statement. This Grid IP updates the environmental objectives set out in the previous Grid 25 IP 2017-2022 and 2011-2016 and sets out the way grid projects will be developed over the next five years. The documents can be found on our website here.

Six-step process for developing the grid

The TDP is a snapshot of the development of the transmission network at a particular point in time. These needs are presented in a manner consistent with our approach to developing the grid. Our approach has six steps and helps to determine whether and how we develop the grid. The six steps are illustrated in the figure below. At each step in this process, we make decisions that narrow our focus for the choices required in the next step.

Figure B-1: Six-step process for our grid projects

Step 1:
How do we identify the future needs of the electricity grid?

We start to identify the future needs of the electricity grid by considering potential changes in the demand for electricity. These changes are influenced by factors such as how and where electricity is generated and changes in demand for electricity. We consider these changes by developing a set of scenarios, known as Tomorrow's Energy Scenarios[64], that explore the future of electricity. Considering these scenarios helps us to plan and identify grid improvements that may be necessary. This in turn helps us to identify projects to meet potential future needs. The scenarios respond to many factors including Government policy, stakeholder feedback, the economy and expected growth in electricity demand. We review the scenarios to consider new trends, changes in the industry and other factors. The outcome of this work may propose a potential need to reinforce the grid, or a need for an asset refurbishment. When we have identified and confirmed a need, we start a formal process of project development. At this point, the only decision that has been made is to confirm that there is a need for a grid development project.

Step 2:
What technologies can meet these needs?

In Step 2 we look at a range of technical options that can meet the need or needs we confirmed in Step 1. As part of this process, we seek feedback from the public and stakeholders on a list of potential technical solutions, to understand which options are considered suitable. From this feedback, we produce a shortlist of options to consider in more detail. The options are assessed based on:

- Which technologies are available for use?
- Which option would be preferable – overhead lines or underground cables?
- What related upgrades will the existing network need because of new infrastructure?
- Which substations may need an upgrade?
- What does this mean for the lines connecting these substations?

At this point, we publish the options we think should go forward and the ones we have ruled out. We ask the public for their views on these options, which are considered along with other factors. We will then decide on the most appropriate technical solutions to bring forward to the next step.

64 Tomorrow's Energy Scenarios (TES) (EirGrid)

Step 3:
What's the best option and what area may be affected?

During this step, we study the potential benefits and impacts of the different options we could build and where we could build them. For our largest projects, we are likely to spend over a year at this step. When we are considering where we may build a project, we start by looking at a study area. This is a broad area within a region, rather than a specific, detailed route. During Step 3, we will ask for the public's views on a specific technology option and on the study area where we want to locate the project. In line with EirGrid's Public Engagement strategy, a community forum comprising of local voluntary, community, business and political representatives will be established at this step. This forum provides insight and local knowledge which will assist the project team in deciding on the most deliverable routes. Issues normally discussed include environmental concerns, questions about land use, or other topics that could affect the technology options. As part of this process, we will publish information about all the technologies and areas and give our opinion on their suitability. At the end of Step 3, we will base our decision on a detailed analysis of feedback and on economic, technical, social, deliverability and environmental factors[65].

Step 4:
Where exactly should we build?

Following consultation and engagement in Steps 1, 2 and 3 we have made some key decisions on the technology we will use and roughly where the project will be built. We will continue to examine and consider both an overhead line option and an underground cable option if a new line is needed. In Step 4, we will assess the most appropriate place to build the project. At this step, the public can significantly influence exactly where we build the project. During this step, we work closely with local people – especially landowners who will be directly affected by a project. We will engage with landowners and the wider community to understand which locations for new infrastructure are preferred by local people. At this stage, our aim is to collaborate on an agreed route or site, once it is possible and practical. We will consider all the information gathered in this step, including local knowledge. We will then decide on a preferred route or site to include in our planning application.

65 Although the funding requirements for projects is a consideration in the Governance approval process as part of the regulatory framework as detailed in Section 1.4.4, a Multi-Criteria Decision-Making Analysis (MCDA) process (economic, technical, social, deliverability and environmental factors) is used by EirGrid in the investment planning stage of project development for transmission system reinforcement projects.

Step 5:
The planning process

Where a project requires planning permission, we will apply to the planning authority – either An Bord Pleanála or the Local Planning Authority. We will publish a notice in the newspapers when we lodge this application. We will also continue to provide regular project updates. Once we make an application to An Bord Pleanála, it may decide to hold an oral hearing. This will give those who submitted a written opinion a chance to share their views about the project. Where possible, we will respond to submissions from those who are directly affected by our plans. When the planning process ends, the planning authority will do one of the following:

- Grant permission.
- Grant permission on the basis that EirGrid makes some changes to its application.
- Refuse permission.

Step 6:
Construction, energisation and benefit sharing

We continue to engage with the public and stakeholders throughout the construction phase of the project. Though EirGrid plans the future of the electricity grid, it is ESB Networks, in most cases, that builds new onshore grid infrastructure. EirGrid and ESB Networks will work together to minimise any impact during construction. EirGrid will continue to engage with the public on issues such as road access or planning the schedule of works. We will also inform the wider community of the progress of the project, up to the final process of testing, energisation and completion. When we build new transmission infrastructure in an area, we set up a Community Fund and establish Proximity Payments for the project. We make Proximity Payments when new transmission infrastructure is built within 200m of homes in a rural location. The Community Fund awards grants to local organisations and other good causes in a project area.

Appendix C:
Summary of projects

Summary of projects in the Border, Midlands and West

There are 68 projects in the Border, Midlands and West region. These projects are listed below.

Table A-5: Projects in the Border, Midlands and West

	CP No.	Project title	Type	km	
1	CP0466	North South 400 kV Interconnector – RoI	New build capacity	137	
2	CP0644	Bracklone 110 kV Station – DSO	New build connection	–	
3	CP0816	North Connacht 110 kV Project	New build capacity	–	
4	CP0817	Flagford – Sliabh Bawn 110 kV Circuit Uprate	Uprate/Modify	21.2	
5	CP0835	Coolnabacky – Portlaoise 110 kV Line Uprate	Uprate/Modify	8	
6	CP0839	Moy 110 kV Station Reconfiguration and Busbar Uprate	Uprate/Modify	–	
7	CP0841	Arva – Carrick-on-Shannon 110 kV Line Uprate	Uprate/Modify	43	
8	CP0848	Castlebar-Cloon 110 kV Line Uprate-Refurb	Uprate/Modify	57.3	
9	CP0867	Flagford – Louth 220 kV Line Refurbishment	Refurbish/Replace	110	
10	CP0871	Galway 110 kV Station Redevelopment Project	Uprate/Modify	–	
11	CP0905	Louth – Rathrussan 110 kV No 1 Line Uprate	Uprate/Modify	39	
12	CP0907	Dalton 110 kV Busbar	Uprate/Modify	–	
13	CP0919	Lanesboro 110 kV Station Redevelopment Project	Uprate/Modify	–	
14	CP1000	Lanesboro – Mullingar 110 kV Thermal Uprate	Uprate/Modify	46	
15	CP1003	Cushaling – Portlaoise 110 kV Line Uprate	Uprate/Modify	41.7	
16	CP1023	Letterkenny Station Redevelopment	New build capacity	–	
17	CP1031	Flagford 220 kV Station Sprecher & Schuh CB Replacement	Refurbish/Replace	–	
18	CP1032	Cashla 220 kV Station Sprecher & Schuh CB Replacement	Refurbish/Replace	–	
19	CP1048	Power Flow Control Scheme	New build capacity	–	
20	CP1059	Shannonbridge B – Raghra station	New build connection	–	
21	CP1060	Loughteague 110 kV Solar Farm	New build connection	–	
22	CP1073	Croaghaun West 110 kV Station (Oweninny 3 Wind Farm)	New build connection	–	
23	CP1078	Lanesboro – Sliabh Bawn 110 kV Line Uprate	Uprate/Modify	9.4	
24	CP1079	Binbane – Cathaleen's Fall 110 kV Line Uprate	Uprate/Modify	34.3	
25	CP1119	Cashla Flagford 220 kV Line Refurbishment	Refurbish/Replace	88	

	Drivers				Location	Step	LED	GW3 (CA)	GW6 (PA)	Energisation
	Security of supply	Sustainability	Market integration	Asset management						
	■	■	■		Armagh, Cavan, Meath, Monaghan, Tyrone	5	TSO	21/09/2016	28/06/2024	30/06/2027
	■				Laois	6	DSO	19/03/2020	01/06/2022	01/06/2026
		■			Mayo, Roscommon	6	TSO	12/09/2018	20/12/2023	31/03/2028
	■	■			Roscommon	6	TSO	18/02/2021	02/06/2022	03/11/2025
	■	■			Kildare, Laois	5	TSO	30/05/2018	26/09/2024	01/12/2025
	■	■			Mayo	6	TSO	30/09/2014	07/10/2015	29/11/2024
	■	■			Cavan, Leitrim, Longford, Roscommon	6	TSO	21/05/2020	15/12/2021	30/11/2025
	■	■			Galway, Mayo	6	TSO	16/09/2020	20/12/2023	01/12/2025
	■			■	Cavan, Leitrim, Longford, Louth, Meath, Roscommon	6	TSO	20/04/2015	30/04/2020	30/11/2025
	■	■			Galway	6	TSO	21/06/2017	21/12/2018	30/11/2024
	■			■	Cavan, Louth, Monaghan	6	TSO	25/05/2016	29/08/2022	30/09/2025
	■	■			Mayo	6	TSO	01/10/2021	06/09/2023	24/11/2026
		■			Longford	6	TSO	28/12/2017	30/06/2020	30/11/2029
	■				Longford, Westmeath	5	TSO	29/01/2021	10/09/2024	30/11/2025
	■	■		■	Offaly, Portlaoise	3	TSO	05/07/2023	05/12/2025	30/11/2029
	■	■			Donegal	4	TSO	17/06/2021	10/09/2024	28/09/2029
	■			■	Roscommon	6	TSO	30/06/2018	11/07/2019	20/11/2026
	■			■	Galway	6	TSO	30/06/2018	11/07/2019	30/11/2026
		■			Longford	4	TSO	04/02/2021	25/11/2024	29/11/2027
	■	■			Offaly	6	DEV	28/05/2021	12/10/2022	30/06/2025
		■			Laois	6	DEV	03/06/2020	05/11/2021	30/11/2026
		■			Mayo	3	DEV	02/07/2020	30/04/2024	23/04/2027
	■				Longford, Roscommon	5	TSO	18/02/2021	14/02/2024	30/11/2025
	■	■			Donegal	6	TSO	29/01/2021	07/06/2023	11/09/2024
	■			■	Galway, Roscommon	5	TSO	26/02/2021	21/03/2024	18/12/2025

	CP No.	Project title	Type	km	
26	CP1126	Mully Graffy Windfarm	New build connection	–	
27	CP1139	Sligo & Srananagh 220 & 110 kV Protection Upgrade	Refurbish/Replace	–	
28	CP1142	Firlough 110 kV Station (Firlough WF)	New build connection	–	
29	CP1143	Derrylahan 110 kV Station (Blackwater Bog Solar)	New build connection	–	
30	CP1152	Arva and Connected Stations 110 kV Protection Upgrade	Refurbish/Replace	–	
31	CP1153	Oldstreet Tynagh & Cashla 400 kV and 220 kV Protection Upgrade	Refurbish/Replace	–	
32	CP1155	Glenree – Moy 110 kV Line Uprate	Uprate/Modify	13.86	
33	CP1156	Sligo 110 kV Station – Shrananagh 1 & 2 Bay Uprates	Uprate/Modify	–	
34	CP1158	Clonfad Solar	New build connection	–	
35	CP1161	Cathaleen's Fall and connected Stations 110 kV Protection Upgrade	Refurbish/Replace	–	
36	CP1168	Cashla-Salthill 110 kV Thermal Uprate	Uprate/Modify	9.4	
37	CP1170	Newbridge – Portlaoise 110 kV Line Uprate	Uprate/Modify	21.8	
38	CP1174	Aghaleague 110 kV Station	New build connection	–	
39	CP1191	Cashla-Galway 110 kV Cot 1 Line uprate	Uprate/Modify	13.8	
40	CP1199	Derryiron – Thornsberry 110 kV Line Uprate	Uprate/Modify	19.67	
41	CP1201	Bogtown 110 kV Station	New build connection	–	
42	CP1217	Philipstown 110 kV Station (Cushaling Wind Farm)	New build connection	–	
43	CP1219	Coole Wind Farm	New build connection	–	
44	CP1220	Garrintaggart 110 kV Station – Pinewoods Wind Farm	New build connection	–	
45	CP1231	Knockdrin 110 kV Station (Yellow River Wind Farm)	New build connection	–	
46	CP1232	Derryiron 110 kV Busbar Uprate	Uprate/Modify	–	
47	CP1234	Laurencetown 110 kV Station (Clonin North Solar Farm)	New build connection	–	
48	CP1237	Ferry View 110 kV Station (Knockranny Wind Farm)	New build connection	–	
49	CP1255	Castlelost FlexGen	New build connection	–	
50	CP1259	Cuilleen Power	New build connection	–	
51	CP1262	Shanonagh 110 kV Station	New build connection	–	
52	CP1264	Rhode ESS	New build connection	–	
53	CP1272	Derryiron Temporary Bypass Project	Uprate/Modify	–	

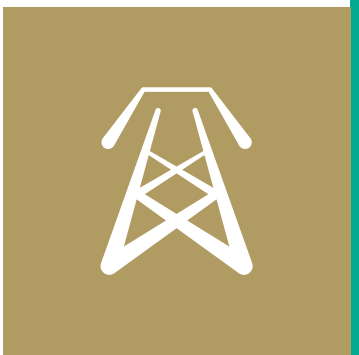
66 As of the data freeze date, the energisation date is not publicly available at this time.

Drivers				Location	Step	LED	GW3 (CA)	GW6 (PA)	Energisation
Security of supply	Sustainability	Market integration	Asset management						
	■			Donegal	4	DEV	06/08/2020	30/04/2024	28/11/2025
■			■	Sligo	6	TSO	01/10/2020	16/07/2021	30/11/2025
	■			Mayo	3	DEV	04/02/2021	30/04/2026	30/06/2027
	■			Offaly	3	DEV	06/05/2021	15/12/2024	28/03/2025
■			■	Cavan	6	TSO	12/11/2020	01/09/2021	12/12/2025
■			■	Galway	6	TSO	12/11/2020	05/08/2021	30/11/2025
■	■			Sligo, Mayo	6	TSO	15/04/2021	20/12/2023	30/06/2025
■	■			Sligo	6	TSO	18/06/2021	04/04/2022	30/11/2025
	■			Westmeath	6	DEV	19/01/2021	22/12/2022	31/10/2025
■			■	Cavan, Donegal, Sligo	6	TSO	04/12/2020	01/12/2021	30/11/2025
■	■			Galway	5	TSO	18/03/2021	05/06/2024	30/11/2025
■				Newbridge, Portlaoise	5	TSO	05/08/2021	22/02/2024	26/02/2026
	■			Roscommon	3	DEV	02/03/2022	17/03/2025	30/10/2025
■	■			Galway	3	TSO	21/11/2022	30/12/2025	30/11/2029
	■			Offaly	6	TSO	19/11/2021	20/12/2023	25/10/2027
■				Offaly	5	DEV	07/10/2021	10/11/2022	13/02/2024
	■			Offaly	6	DEV	03/02/2022	25/10/2023	[66]
	■			Westmeath	4	DEV	01/02/2022	01/11/2024	29/08/2025
	■			Laois	4	DEV	01/02/2022	12/01/2024	29/08/2025
	■			Offaly	5	DEV	07/04/2022	05/09/2023	15/09/2025
■	■			Offaly	6	TSO	29/04/2022	05/07/2023	31/12/2025
	■			Offaly	5	DEV	07/04/2022	16/10/2023	17/11/2025
	■			Galway	3	DEV	07/07/2022	01/01/2024	[66]
■				Westmeath	5	DEV	04/05/2022	28/08/2023	10/04/2025
■				Roscommon	3	DEV	05/05/2022	20/03/2024	23/11/2025
	■			Westmeath	3	DEV	10/11/2022	26/07/2024	31/10/2025
■	■			Offaly	5	DEV	23/06/2022	01/09/2023	26/06/2026
■	■			Offaly	3	TSO	12/10/2022	28/07/2023	29/03/2024

	CP No.	Project title	Type	km	
54	CP1275	Cashla-Galway 110 kV Circuit 2 Uprating	Uprate/Modify	11.3	
55	CP1276	Cashla-Galway 110 kV Circuit 3 Uprating	Uprate/Modify	11.3	
56	CP1282	Clogher – Drumkeen 110 kV Line Alteration	Refurbish/Replace	–	
57	CP1286	Tonroe 110 kV Station DSO	New build capacity	–	
58	CP1311	Athlone – Lanesboro 110 kV Line Uprate	Uprate/Modify	35.78	
59	CP1321	Cashla – Dalton 110 kV Circuit 1 (DLR)	Uprate/Modify	60.76	
60	CP1322	Cathaleen's Fall – Coraclassy 110 kV Circuit 1 (DLR)	Uprate/Modify	61.06	
61	CP1329	Stonestown 110 kV Station_Derrinlough Wind Farm	New build connection		
62	CP1341	Cloon 110 kV_Barnacurragh Solar Park	New build connection	–	
63	CP1352	Gortatleva 110 kV Station (Ballymoneen Solar Park)	New build connection	–	
64	CP1355	Corbetstown 110 kV Station (Garr Solar and Storage)	New build connection	–	
65	CP1393	Offshore Phase 1 Project 1 (Skerds Rock)	New build connection	–	
66	CP1414	Kilcumber 110 kV Station (Cloncreen Battery Phase 2)	New build connection		
67	CP1428	Cashla – Dalton 110 kV Thermal Capacity	Uprate/Modify	60.8	
68	CP1429	Castlebar – Dalton 110 kV Thermal Capacity	Uprate/Modify	27.82	

67 As of the data freeze date, the energisation date is not publicly available at this time.

	Drivers				Location	Step	LED	GW3 (CA)	GW6 (PA)	Energisation
	Security of supply	Sustainability	Market integration	Asset management						
	■	■			Galway	3	TSO	21/11/2022	30/12/2025	31/12/2029
	■	■			Galway	3	TSO	21/11/2022	30/12/2025	31/12/2029
	■				Donegal	3	DSO	31/03/2023	18/10/2024	31/12/2026
	■				Roscommon	3	DSO	11/08/2023	30/04/2024	23/09/2025
	■	■			Longford, Roscommon	3	TSO	16/02/2023	30/09/2025	30/11/2029
	■	■			Galway, Mayo	3	TSO	23/03/2023	20/12/2024	28/11/2025
	■	■			Cavan, Leitrim, Donegal	3	TSO	05/04/2023	30/12/2024	28/11/2025
		■			Offaly	6	DEV	28/11/2022	02/10/2023	19/08/2024
		■			Galway	3	DEV	04/04/2023	29/07/2024	28/04/2027
		■			Galway	3	DEV	09/04/2023	29/07/2024	28/04/2027
	■	■			Offaly	3	DEV	23/08/2023	31/03/2025	31/12/2027
		■			Galway	3	TSO	15/12/2022	31/12/2024	30/06/2027
	■	■			Offaly	6	DEV	06/09/2023	13/03/2024	[67]
		■			Galway, Mayo	3	TSO	13/11/2023	31/03/2025	[67]
		■			Mayo	3	TSO	13/11/2023	31/03/2025	[67]



Summary of projects in the Southwest and Midwest

There are 40 projects in the Southwest and Midwest region. These are listed in Table A-6 below.

Table A-6: Projects in the Southwest and Midwest

	CP No.	Project title	Type	km	
1	CP0622	Tarbert 220 kV Station Upgrade	Refurbish/Replace	–	
2	CP0624	Killonan 220 kV Station Refurbishment – Killonan Station Works	Refurbish/Replace	–	
3	CP0741	Trabeg 110 kV Station – uprate 2x110 kV transformer bays and control room extension DSO	Uprate/Modify	–	
4	CP0796	Knockraha Station and Installation of Additional Couplers	Uprate/Modify	–	
5	CP0873	Dunstown – Moneypoint 400 kV Refurbishment	Refurbish/Replace	209	
6	CP0901	Kilbarry – Knockraha 110 kV No.2 Line Refurbishment	Refurbish/Replace	12.5	
7	CP0917	Prospect – Tarbert 220 kV Cable Replacement Project	Refurbish/Replace	2.48	
8	CP0949	Kilbarry 110 kV GIS Station	New build connection	–	
9	CP0973	Knockraha Short Circuit Rating Mitigation	Uprate/Modify	–	
10	CP0983	Point on Wave Controller for Glanagow 220 kV Station	Uprate/Modify	–	
11	CP1062	Drombeg Solar 110 kV Station	New build connection	–	
12	CP1069	Ballinknockane Solar Farm	New build connection	–	
13	CP1111	Ballydine, Cahir and Connected Stations 110 kV Protection Upgrade	Refurbish/Replace	–	
14	CP1112	Limerick and Connected Stations 110 kV Protection Upgrade	Refurbish/Replace	–	
15	CP1116	Tipperary, Cahir and Connected Stations 110 kV Protection Upgrade	Refurbish/Replace	–	
16	CP1128	Ballynabrannagh 110 kV Station (Moonatooreen Solar)	New build connection	–	
17	CP1129	Aghada BESS 02	New build connection		
18	CP1132	Cow Cross New 110 kV Transformer	New build capacity	–	
19	CP1160	Coolroe, Inniscarra & Connected Stations Protection Upgrade	Refurbish/Replace	–	
20	CP1164	West Cork 110 kV Protection Upgrade	Refurbish/Replace	–	

68 As of the data freeze date, the energisation date is not publicly available at this time.

	Drivers				Location	Step	LED	GW3 (CA)	GW6 (PA)	Energisation
	Security of supply	Sustainability	Market integration	Asset management						
	■			■	Kerry	6	DSO	29/05/2012	16/12/2014	[68]
	■			■	Limerick	6	TSO	30/09/2011	01/04/2019	16/11/2027
	■				Cork	6	DSO	03/06/2020	29/04/2021	01/05/2025
	■				Cork	6	TSO	21/09/2016	30/09/2016	30/11/2025
	■			■	Clare, Kildare, Laois, Limerick, Offaly, Tipperary	6	TSO	20/06/2014	05/12/2019	30/11/2026
	■			■	Cork	6	TSO	13/05/2020	03/10/2022	10/11/2025
	■			■	Kerry	4	TSO	16/06/2021	31/03/2024	28/11/2025
	■				Cork	6	DSO	14/02/2017	04/03/2021	10/11/2025
	■				Cork	6	TSO	03/11/2016	21/06/2019	03/11/2025
	■				Cork	6	TSO	04/08/2016	23/05/2017	10/11/2025
		■			Kerry	6	DEV	28/06/2019	17/12/2020	13/05/2025
		■			Limerick	6	DEV	16/05/2019	24/12/2020	25/04/2025
	■			■	Tipperary	6	TSO	21/05/2020	18/07/2021	30/11/2025
	■			■	Limerick	6	TSO	21/05/2020	19/12/2023	31/12/2025
	■			■	Tipperary	6	TSO	13/05/2020	14/07/2021	30/11/2025
		■			Cork	3	DEV	04/11/2021	30/04/2024	30/06/2025
		■			Cork	6	DSO	05/11/2020	17/12/2021	02/02/2024
	■				Cork	6	DSO	02/09/2020	07/10/2021	26/06/2024
	■			■	Cork	6	TSO	04/12/2020	04/11/2021	30/11/2024
	■			■	Cork	6	TSO	04/02/2021	03/02/2022	30/11/2025

	CP No.	Project title	Type	km	
21	CP1173	Glencloosagh Phase 1 – Rotating Stabiliser	Uprate/Modify	–	
22	CP1207	Lisheen – Thurles 110 kV Protection Upgrade	Refurbish/Replace	–	
23	CP1209	Brown Boveri Circuit Breaker Replacements	Refurbish/Replace	–	
24	CP1211	Bandon – Dunmanway 110 kV Circuit Thermal Capacity	Uprate/Modify	25.9	
25	CP1212	Bandon – Raffeen 110 kV Circuit Thermal Capacity	Uprate/Modify	27.2	
26	CP1215	Knockraha Station Celtic IC Non-contested Works	New build connection	–	
27	CP1222	Knockraha 220 kV Transformer Replacement	Refurbish/Replace	–	
28	CP1223	Bandon 110 kV Busbar Rating Needs	Refurbish/Replace	–	
29	CP1236	Timoney 110 kV Station	New build connection	–	
30	CP1240	Coumaclovane Solar Extension	New build connection	–	
31	CP1245	Castletreasure 110 kV Station	New build connection	–	
32	CP1246	Coomnaclohy 110 kV Station (Knocknamork Wind and Solar Park)	New build connection	–	
33	CP1247	New Ballyvouskill 220-110 kV Transformer	New build capacity	–	
34	CP1297	Glansillagh 220 kV Station	New build connection	–	
35	CP1320	Barrymore Cahir Knockraha 110 kV Line Uprate	Uprate/Modify	63.5	
36	CP1351	Ballynadrideen 110 kV Station (Ballyroe Solar)	New build connection	–	
37	CP1354	Coolshamroge 110 kV Station (Manusmore Solar Park)	New build connection	–	
38	CP1412	Knockraha 220 kV Transformer Replacement (T2102)	Refurbish/Replace	–	
39	CP1437	Clahane – Tralee 110 kV Circuit Alteration CAR	Uprate/Modify		
40	CP1438	Glanagow – Raffeen 220 kV Circuit Alteration	Uprate/Modify		

69 As of the data freeze date, the energisation date is not publicly available at this time.

	Drivers				Location	Step	LED	GW3 (CA)	GW6 (PA)	Energisation
	Security of supply	Sustainability	Market integration	Asset management						
					Kerry	3	TAO	06/05/2021	30/06/2024	30/07/2025
	■			■	Tipperary	5	TSO	04/11/2021	25/10/2022	30/07/2025
	■			■	Clare, Cork, Limerick	6	TSO	31/03/2022	20/12/2023	01/12/2028
	■	■	■		Cork	3	TSO	21/01/2022	30/09/2024	27/11/2026
	■	■	■		Cork	3	TSO	28/01/2022	31/12/2024	31/12/2027
	■	■	■		Cork	6	TSO	23/02/2022	06/12/2023	31/12/2026
	■			■	Cork	5	TSO	19/01/2022	15/12/2022	10/10/2025
		■			Cork	4	TSO	03/05/2023	30/06/2025	03/12/2029
		■			Tipperary	3	DEV	07/07/2022	01/04/2024	31/03/2025
		■			Kerry	3	DEV	31/08/2022	30/09/2024	31/10/2025
		■			Cork	3	DEV	09/09/2022	28/06/2024	28/11/2025
		■			Cork	3	DEV	07/07/2022	30/08/2024	30/06/2025
	■	■			Cork	3	TSO	10/05/2022	28/08/2023	01/12/2025
	■		■		Kerry	3	DEV	08/06/2023	22/05/2025	01/11/2028
	■				Cork, Tipperary	3	TSO	31/07/2022	30/12/2024	01/11/2028
		■			Cork	3	DEV	06/01/2023	20/02/2024	22/10/2026
		■			Clare	3	DEV	05/04/2023	20/05/2024	29/09/2025
	■	■		■	Cork	3	TSO	08/03/2023	05/09/2024	05/11/2027
	■				Kerry	3	DSO	27/09/2023	18/04/2024	[69]
	■				Cork	3	DSO	14/09/2023	19/04/2024	[69]

Summary of projects in the Southeast, Mideast and Dublin

There are 100 projects in the Southeast, Mideast and Dublin region. These are listed in Table A-7 below.

Table A-7: Projects in the Southeast, Mideast and Dublin

	CP No.	Project title	Type	km	
1	CP0580	Carrickmines 220 kV GIS Development	New build capacity	–	
2	CP0585	Laois-Kilkenny (Coolnabacky) 400 kV Station – New Station & Associated Lines & Station Works	New build capacity	52	
3	CP0646	Finglas 110 kV Station Redevelopment	Refurbish/Replace	–	
4	CP0692	Inchicore 220 kV GIS Station Upgrade	Uprate/Modify	–	
5	CP0693	Baroda 110 kV Station – 2 x 110 kV transformer bays DSO	Uprate/Modify	–	
6	CP0749	Oriel Offshore Windfarm	New build connection	–	
7	CP0792	Finglas 220 kV Reconfiguration Project	Uprate/Modify	–	
8	CP0799	Louth 220 kV Station Refurbishment	Uprate/Modify	–	
9	CP0808	Maynooth 220 kV Station Reconfiguration	Uprate/Modify	–	
10	CP0823	Maynooth – Turlough Hill 220 kV Line Refurbishment	Refurbish/Replace	53	
11	CP0866	Great Island – Kellis 220 kV Line Refurbishment	Refurbish/Replace	70	
12	CP0869	Maynooth – Woodland 220 kV Line Uprate	Uprate/Modify	22	
13	CP0872	West Dublin New 220-220 kV Station (Castlebagot 220 kV Station)	New build connection	–	
14	CP0966	Kildare Meath Grid Upgrade	New build capacity	50	
15	CP0967	Moneypoint 400 kV Series Capacitor	New build capacity	–	
16	CP0968	Dunstown 400 kV Series Capacitor	New build capacity	–	
17	CP0969	Oldstreet-Woodland 400 kV Series Compensation	New build capacity	–	
18	CP0970	Cross-Shannon 400 kV Cable	New build capacity	6	
19	CP0984	Belcamp – Shellybanks 220 kV New Cable	New build capacity	10	
20	CP1001	Corduff – Finglas 1 & 2 220 kV Line Refurbishment	Refurbish/Replace	3.7	
21	CP1021	East Meath – North Dublin Reinforcement	New build capacity	45	
22	CP1022	Maynooth – Turlough Hill PLC Replacement	Refurbish/Replace	53	

70 As of the data freeze date, the energisation date is not publicly available at this time.

	Drivers				Location	Step	LED	GW3 (CA)	GW6 (PA)	Energisation
	Security of supply	Sustainability	Market integration	Asset management						
	■			■	Dublin	6	TSO	22/03/2012	14/02/2012	[70]
	■				Laois, Kilkenny	6	TSO	16/04/2008	17/06/2016	02/11/2026
	■			■	Dublin	6	TSO	28/08/2009	24/08/2012	31/10/2025
	■			■	Dublin	6	TSO	21/09/2016	20/03/2019	30/11/2026
	■				Kildare	6	DSO	14/06/2019	10/01/2020	30/03/2025
		■			Louth	4	DEV	27/03/2020	31/12/2024	30/06/2027
	■			■	Dublin	6	TSO	22/04/2015	11/03/2018	31/10/2025
	■			■	Louth	6	TSO	25/09/2013	12/03/2020	28/02/2029
	■				Kildare	5	TSO	16/03/2021	06/06/2024	08/03/2028
	■			■	Kildare, Wicklow	5	TSO	30/06/2017	05/12/2024	01/11/2026
	■				Carlow, Wexford	5	TSO	16/11/2022	30/06/2025	30/11/2029
	■			■	Kildare, Meath	6	TSO	15/08/2019	17/12/2020	30/11/2024
	■				Dublin	6	TSO	07/07/2014	17/05/2017	25/10/2024
	■	■			Kildare, Meath	4	TSO	24/03/2021	29/11/2024	22/09/2028
	■	■			Clare	4	TSO	31/08/2015	28/06/2024	31/12/2027
	■	■			Kildare	6	TSO	15/06/2016	13/12/2023	01/07/2027
	■	■			Galway	6	TSO	15/06/2016	13/12/2023	09/08/2027
	■	■			Clare, Kerry	4	TSO	21/09/2016	16/12/2021	22/05/2026
	■				Dublin	6	TSO	01/07/2016	15/07/2020	[70]
				■	Dublin	3	TSO	10/11/2022	28/06/2024	07/01/2028
		■	■		Meath, Dublin	3	TSO	07/06/2022	30/06/2025	31/12/2029
	■			■	Kildare, Wicklow	6	TSO	22/06/2018	06/12/2019	10/07/2025

	CP No.	Project title	Type	km	
23	CP1041	Timahoe North Solar Farm	New build connection	–	
24	CP1055	Harristown Solar Farm	New build connection	–	
25	CP1064	Finglas Pantograph Replacement Project	Refurbish/Replace	–	
26	CP1086	Dunstown T4201 and Woodland T4201 Transformer Replacement	Refurbish/Replace	–	
27	CP1088	Greenlink Interconnector	New build connection	–	
28	CP1092	New 400 kV Strategic Spare Transformer	New build capacity	–	
29	CP1100	Finglas – North Wall Cable Replacement	Refurbish/Replace	11.9	
30	CP1103	Corduff FlexGen	New build connection	–	
31	CP1104	Pollaphuca Refurbishment Project	Refurbish/Replace	–	
32	CP1108	Dunstown Station 400–220 kV Protection Upgrade	Refurbish/Replace	–	
33	CP1109	Gorman and Connected Stations 220–110 kV Protection Upgrade	Refurbish/Replace	–	
34	CP1110	Woodland Station 400–220 kV Protection Upgrade	Uprate/Modify	–	
35	CP1113	Corduff 220 kV Station Deep Works	New build capacity	–	
36	CP1114	Platin and Connected Stations 220–110 kV Protection Upgrade	Refurbish/Replace	–	
37	CP1115	Drybridge and Connected Stations 110 kV Protection Upgrade	Refurbish/Replace	–	
38	CP1122	Physical Security of Transmission Stations – Dublin Region	Other	–	
39	CP1136	Deenes 110 kV Station (Gaskinstown Solar Farm)	New build connection	–	
40	CP1137	Carlow, Kellis 110 kV Protection Upgrade	Refurbish/Replace	–	
41	CP1140	Athy, Carlow and connected stations 110 kV Protection Upgrade	Refurbish/Replace	–	
42	CP1141	Kellis Station 220 & 110 kV Protection Upgrade	Refurbish/Replace	–	
43	CP1144	Kinnegad 110 kV station, Derryiron 110 kV Bay Conductor Uprate	Uprate/Modify	–	
44	CP1145	Rathnaskilloge Solar Farm	New build connection	–	
45	CP1146	Carrickmines – Poolbeg 220 kV Cable Replacement	Refurbish/Replace	20	
46	CP1150	Inchicore – Poolbeg #2 220 kV Cable Replacement	Refurbish/Replace	16	
47	CP1154	Belcamp Land Acquisition	Other	–	
48	CP1157	Inchicore – Poolbeg #1 220 kV Cable Replacement	Refurbish/Replace	18	

71 As of the data freeze date, the energisation date is not publicly available at this time.

	Drivers				Location	Step	LED	GW3 (CA)	GW6 (PA)	Energisation
	Security of supply	Sustainability	Market integration	Asset management						
		■			Kildare	6	DEV	06/11/2018	21/10/2021	26/07/2024
		■			Meath	6	DEV	20/12/2018	19/11/2020	31/10/2025
	■			■	Dublin	6	TSO	20/12/2019	12/11/2020	31/10/2025
	■			■	Kildare, Meath	3	TAO	01/05/2023	31/07/2024	30/10/2028
	■	■	■		Wexford	6	DEV	20/02/2020	22/06/2022	28/06/2024
	■				Kildare	6	TSO	29/01/2020	15/12/2022	27/06/2025
				■	Dublin	3	TSO	28/06/2022	19/12/2024	02/07/2029
	■				Dublin	6	DEV	02/04/2020	26/07/2022	19/01/2024
	■			■	Kildare	3	TAO	08/09/2023	31/05/2025	31/05/2028
	■			■	Kildare	6	TSO	18/05/2020	19/03/2021	[71]
	■			■	Meath	6	TSO	13/05/2020	25/06/2021	01/12/2025
	■			■	Meath	6	TSO	18/05/2020	19/03/2021	[71]
	■				Dublin	6	TSO	17/08/2020	02/06/2021	30/04/2024
	■			■	Meath	6	TSO	13/05/2020	18/08/2021	30/11/2025
	■			■	Louth, Meath	6	TSO	13/05/2020	16/04/2021	30/11/2025
					Dublin	6	TSO	01/09/2020	08/12/2023	30/12/2025
	■				Meath	6	DEV	19/11/2020	14/12/2022	18/09/2024
	■			■	Carlow	6	TSO	01/10/2020	01/09/2021	10/06/2025
	■			■	Carlow, Kildare, Wicklow	6	TSO	01/10/2020	16/07/2021	10/11/2025
	■			■	Carlow	6	TSO	01/10/2020	01/09/2021	10/11/2025
					Meath	6	TSO	22/01/2021	01/12/2021	29/11/2025
	■				Waterford	6	DEV	07/01/2021	22/07/2022	23/09/2024
				■	Dublin	3	TSO	16/12/2021	18/12/2025	20/06/2029
				■	Dublin	3	TSO	16/12/2021	18/12/2025	28/09/2029
	■				Dublin	4	TSO	19/11/2020	16/02/2024	[71]
				■	Dublin	3	TSO	20/12/2021	18/12/2025	02/08/2029

	CP No.	Project title	Type	km	
49	CP1159	Cullenagh and Connected stations Protection Upgrade	Refurbish/Replace	–	
50	CP1162	Irishtown, Shellybanks and connected Stations 220 kV Protection Upgrade	Refurbish/Replace	–	
51	CP1163	Butlerstown, Killoteran and Waterford 110 kV Protection Upgrade	Refurbish/Replace	–	
52	CP1166	Gorman – Platin 110 kV Line Uprate	Uprate/Modify	19.4	
53	CP1167	Drybridge – Oldbridge – Platin 110 kV Line Uprate	Uprate/Modify	5.3	
54	CP1172	Crane – Wexford 110 kV Circuit Thermal Capacity	Uprate/Modify	22.8	
55	CP1175	Kishoge 110 kV Station	New build connection	–	
56	CP1183	Mooretown 220 kV Station	New build connection	–	
57	CP1188	Kilcarbery	New build connection	–	
58	CP1190	Poolbeg 220 kV Station	New build connection	–	
59	CP1194	Woodland 400 kV Station Redevelopment	Uprate/Modify	–	
60	CP1195	Turlough Hill 220 kV Station Refurbishment	Refurbish/Replace	–	
61	CP1197	Dunstown Asset Replacements	Refurbish/Replace	–	
62	CP1198	Barnakyle MIC Increase	Refurbish/Replace	–	
63	CP1200	Carrickmines Area 220 kV Cable Ducting	New build capacity	2.5	
64	CP1213	Belcamp 220 kV Busbar Extension	Uprate/Modify	–	
65	CP1216	Poolbeg – North Wall 220 kV Cable Replacement	Refurbish/Replace	4.6	
66	CP1225	Finglas Corduff 220 kV Protection Upgrade	Refurbish/Replace	–	
67	CP1230	Darndale Phase 2 – 3 110 kV Customer Connections in Darndale 110 kV Station	New build connection	–	
68	CP1235	Louth – Woodland 220 kV Uprate	Uprate/Modify	61.2	
69	CP1238	Arklow 220 kV Station Redevelopment	Refurbish/Replace	–	
70	CP1241	Belcamp BSP Transfer	Other	–	
71	CP1242	Great Island 220-110 kV Transformer Upgrades	Uprate/Modify	–	
72	CP1244	North Arklow Solar Plus Storage	New build connection	–	
73	CP1248	Harlockstown Solar (Gallanstown Ext)	New build connection	–	
74	CP1249	Porterstown Battery Phase2	New build connection	–	
76	CP1256	Greener Ideas Profile Park	New build connection	–	

Drivers				Location	Step	LED	GW3 (CA)	GW6 (PA)	Energisation
Security of supply	Sustainability	Market integration	Asset management						
■			■	Tipperary, Waterford	6	TSO	04/12/2020	04/11/2021	30/11/2025
			■	Dublin	6	TAO	04/02/2021	04/11/2021	30/11/2026
			■	Waterford	6	TSO	04/02/2021	04/11/2021	10/11/2025
		■		Meath	5	TSO	18/03/2021	18/04/2024	24/11/2025
				Meath, Louth	6	TSO	18/03/2021	27/10/2023	25/11/2025
■		■		Wexford	5	TSO	17/06/2021	09/10/2023	30/11/2025
				Dublin	6	DEV	09/08/2021	19/01/2024	22/11/2024
				Dublin	3	DEV	06/04/2022	12/02/2024	01/12/2025
				Dublin	6	DEV	08/07/2021	16/02/2024	27/06/2025
				Dublin	3	TSO	16/12/2021	30/10/2024	20/07/2027
				Meath	6	TSO	21/03/2022	14/12/2023	30/11/2028
■			■	Wicklow	3	TSO	06/09/2023	01/07/2026	03/12/2029
■			■	Carlow, Dublin, Kildare	6	TSO	31/12/2021	19/12/2023	03/12/2029
				Dublin	3	DEV	27/10/2022	04/09/2024	23/06/2025
■		■		Dublin	6	TSO	30/09/2021	20/12/2022	31/03/2025
				Dublin	3	TSO	16/12/2021	10/06/2024	23/12/2027
			■	Dublin	3	TSO	31/05/2022	19/09/2024	01/12/2028
			■	Dublin	5	TSO	03/02/2022	13/12/2022	30/11/2026
				Dublin	6	TSO	17/06/2022	19/12/2022	19/08/2024
■		■	■	Louth, Meath	3	TSO	28/04/2022	02/06/2025	03/12/2029
■		■	■	Wicklow	3	TSO	20/04/2023	01/09/2025	01/09/2029
				Dublin	3	DSO	01/09/2022	01/05/2024	01/04/2025
■	■			Wexford	6	TSO	07/12/2022	20/12/2023	01/11/2028
■	■			Wicklow	3	DEV	06/10/2022	20/06/2024	30/09/2025
■				Meath	3	DEV	01/06/2022	20/12/2023	14/02/2024
■	■			Kildare	6	DEV	01/06/2022	30/11/2023	24/03/2025
				Dublin	3	DEV	05/05/2022	12/03/2024	02/07/2025

	CP No.	Project title	Type	km	
76	CP1257	Kilshane Power Station	New build connection	–	
77	CP1260	Tracystown Solar	New build connection	–	
78	CP1265	Corkagh 110 kV Station Phase 2	New build connection	–	
79	CP1267	Arklow 220 kV – DSO Ballymanus WF	New build connection	–	
80	CP1268	Dunfirth 110 kV – DSO Dysart PV	New build connection	–	
81	CP1269	Lodgewood 220 kV – DSO The Dell SF	New build connection	–	
82	CP1277	Customer 110 kV Line Diversion	Uprate/Modify	10	
83	CP1281	Batter Lane DSO Station	New build capacity	–	
84	CP1284	Walterstown 110 kV Station DSO	New build capacity		
85	CP1287	Ringsend Cable Diversion	Other		
86	CP1291	Carlow 110 kV Station Busbar Thermal Capacity Need	Uprate/Modify		
87	CP1296	Rinawade 110 kV GIS Station (Liffey Park)	New build capacity	–	
88	CP1334	Newbarn 110 kV Station (Fieldstown Solar Farm)	New build connection	–	
89	CP1335	Garballagh 110 kV Station (Garballagh 2 Solar Farm)	New build connection	–	
90	CP1338	Effernoge 110 kV Station (Tomsallagh Solar)	New build connection	–	
91	CP1342	Drumcamill 110 kV Station (Monvallet Hybrid Solar and Battery Farm)	New build connection	–	
92	CP1346	Meath Hill 110 kV Station (Ardagh South Energy Storage)	New build connection	–	
93	CP1347	Dunbrody 110 kV Station (Kilmannock Battery Storage Facility Phase 2)	New build connection	–	
94	CP1353	Bendinstown 110 kV Station (Garreenleen Solar)	New build connection	–	
95	CP1390	Maynooth – Rinawade 110V Line Uprate	Uprate/Modify	6.95	
96	CP1394	Offshore Phase 1 Project 2 (Codling Wind Park)	New build connection	–	
97	CP1396	Offshore Phase 1 Project 4 (Arklow Bank Wind Park)	New build connection	–	
98	CP1397	Offshore Phase 1 Project 5 (North Irish Sea Array)	New build connection	–	
99	CP1398	Offshore Phase 1 Project 7 (Dublin Array)	New build connection	–	
100	CP1403	Rinawade – Dunfirth 110 kV uprate	Uprate/Modify	28.78	

72 As of the data freeze date, the energisation date is not publicly available at this time.

	Drivers				Location	Step	LED	GW3 (CA)	GW6 (PA)	Energisation
	Security of supply	Sustainability	Market integration	Asset management						
			■		Dublin	3	DEV	05/05/2022	29/07/2024	01/12/2025
	■				Wexford	3	DEV	30/05/2022	28/02/2024	30/06/2025
					Dublin	6	TSO	26/07/2022	25/10/2023	24/07/2025
	■				Wicklow	3	DSO	30/09/2022	06/11/2023	01/12/2025
	■				Kildare	3	DEV	30/09/2022	29/03/2024	01/08/2025
	■				Wexford	6	DEV	01/09/2022	20/12/2023	16/04/2026
			■		Kildare, Meath	3	TAO	30/11/2022	29/03/2024	28/11/2025
					Dublin	3	DSO	09/02/2023	01/05/2024	01/04/2025
					Meath	3	DSO	15/12/2023	10/10/2025	10/10/2027
	■				Dublin	3	DSO	15/10/2023	29/03/2024	[72]
	■				Carlow	3	TSO	07/06/2023	20/12/2024	23/11/2029
			■		Kildare	3	DEV	06/11/2023	08/07/2024	31/03/2027
		■			Dublin	3	DEV	01/08/2023	29/11/2024	01/06/2027
		■			Meath	3	DEV	20/07/2023	29/09/2024	20/02/2025
		■			Wexford	3	DEV	15/09/2023	18/11/2024	15/07/2027
		■			Louth	3	DEV	06/06/2023	09/09/2024	08/06/2027
	■				Meath	3	DEV	04/09/2023	29/11/2024	31/08/2027
	■	■			Wexford	3	DEV	14/06/2023	09/09/2024	08/06/2027
		■			Carlow	3	DEV	20/04/2023	28/06/2024	20/04/2027
	■	■			Kildare	3	TSO	06/06/2023	07/03/2025	01/11/2029
		■			Wicklow	3	TSO	15/12/2022	31/12/2024	30/06/2027
		■			Wicklow	3	TSO	15/12/2022	31/12/2024	30/06/2027
		■			Dublin	3	TSO	15/12/2022	31/12/2024	30/06/2027
		■			Dublin, Wicklow	3	TSO	15/12/2022	31/12/2024	30/06/2027
	■	■			Kildare, Meath	3	TSO	18/05/2023	30/05/2026	28/09/2029

Summary of projects in multiple locations

There are 15 projects in multiple locations and they are listed in Table A-8 below.

Table A-8: Planned projects at multiple locations

	CP No.	Project title	Type	km	
1	CP0857	Paint Towers Nationwide	Refurbish/Replace	–	
2	CP1002	Cushaling – Newbridge 110 kV Thermal Uprate	Uprate/Modify	24.6	
3	CP1096	Transformer Protection Upgrade, 6 Stations	Refurbish/Replace	–	
4	CP1123	Physical Security of Transmission Stations – South Region	Other		
5	CP1124	Physical Security of Transmission Stations – North Region	Other		
6	CP1125	Physical Security of Transmission Stations – Central Region	Other		
7	CP1149	Newbridge – Cushaling 110 kV Line, Stations Bay Conductors and Lead-in Conductor Uprate	Uprate/Modify		
8	CP1182	Transformer Restoration Project	Refurbish/Replace	–	
9	CP1186	Agannygal, Ennis and Connected Stations 110 kV Protection Upgrade	Refurbish/Replace		
10	CP1227	Cashla and Connected Stations 220 kV & 110 kV Protection Upgrade	Refurbish/Replace		
11	CP1228	Shannonbridge and Connected Stations 220 kV & 110 kV Protection Upgrade	Refurbish/Replace		
12	CP1250	Sprecher and Schuh Circuit Breaker Replacement	Refurbish/Replace	–	
13	CP1300	Climate Change Adaptation Measures	Other	–	
14	CP1304	Strategic Spares for OHL, Stations and Cables	Refurbish/Replace	–	
15	CP1391	Maynooth-Derryiron-Timahoe 110 kV Line Uprate	Uprate/Modify	43.2	

73 As of the data freeze date, the energisation date is not publicly available at this time.

	Drivers				Location	Step	LED	GW3 (CA)	GW6 (PA)	Energisation
	Security of supply	Sustainability	Market integration	Asset management						
	■			■	Carlow, Cork, Dublin, Kildare, Kilkenny, Louth, Meath, Offaly, Wicklow	6	TSO	17/02/2014	24/11/2014	31/10/2026
		■		■	Kildare, Offaly	3	TSO	30/03/2023	19/12/2025	30/11/2029
	■			■	Cork, Galway, Mayo, Tipperary, Sligo	6	TSO	10/02/2020	02/10/2020	30/11/2025
	■				Cork, Tipperary, Waterford, Wexford, Wicklow	6	TSO	07/05/2021	08/12/2023	31/03/2026
	■				Cavan, Louth, Meath, Monaghan, Roscommon	6	TSO	11/06/2021	08/12/2023	30/12/2025
	■				Carlow, Cork, Kildare, Kilkenny, Limerick, Wicklow	6	TSO	14/07/2021	08/12/2023	30/12/2025
	■	■			Kildare, Offaly	6	TSO	22/01/2021	04/11/2021	10/11/2025
	■			■	Carlow, Cork, Galway, Kildare, Laois, Louth, Meath, Offaly, Sligo	3	TAO	31/03/2023	25/07/2024	30/11/2029
	■			■	Clare, Galway, Offaly	5	TSO	05/08/2021	08/09/2022	31/12/2025
	■			■	Clare, Galway	5	TSO	02/02/2022	21/09/2022	30/11/2026
	■			■	Offaly, Roscommon, Tipperary	5	TSO	03/02/2022	26/09/2022	30/11/2026
	■			■	Cork, Kildare, Kerry, Limerick, Mayo, Waterford	3	TSO	09/10/2023	12/12/2024	14/03/2030
				■	Cork, Kerry, Offaly, Roscommon, Waterford	3	TSO	05/04/2023	30/09/2025	[73]
				■		3	TSO	08/03/2023	28/03/2024	[73]
	■	■			Kildare, Offaly	3	TSO	05/04/2023	30/09/2025	08/11/2029

Appendix D: References

Our published documents

EirGrid's Strategy 2020-2025
September 2019

Shaping our electricity future v1.0
November 2021

Shaping out electricity future v1.1
July 2023

Transmission Development Plan (TDP) 2023-2032
December 2023

Transmission System Security and Planning Standards (TSSPS)
May 2016

Ireland's Grid Development Strategy – Your Grid Your Tomorrow
January 2017

All-Island Ten-Year Transmission Forecast Statement (TYTFS) 2022-2031
January 2024

All-Island Generation Capacity Statement (GCS) 2023-2032
January 2024

Tomorrow's Energy Scenarios 2023
November 2023

Network Delivery Portfolio Q4 2023
February 2024

ENTSO-E published documents

Ten Year Network Development Plan (TYNDP) 2022
April 2022

Offshore Network Development Plan
January 2024

National Legislation

Electricity Regulation Act, 1999

Planning and Development Act, 2000
(as amended)

Strategic Infrastructure Act, 2006

Statutory Instrument No. 445 of 2000
European Communities (Internal Market in Electricity) Regulations

Statutory Instrument No. 60 of 2005
European Communities (Internal Market in Electricity) Regulations

Statutory Instrument No. 147 of 2011
European Communities (Renewable Energy) Regulations

Statutory Instrument No. 227 of 2022
European Union (Internal Market in Electricity) Regulations

European Legislation

Birds and Natural Habitats Regulations
2011

Cross-border Exchanges in Electricity Regulation (EC) No 714/2009

Environmental Impact Assessment Directive

Habitats Directive

Internal Market for Electricity Directive 2009/72/EC

Internal Market for Electricity Directive 2019/944/EC

Promotion of the Use of Energy from Renewable Resources Directive 2009/28/EC

Energy Efficiency Directive 2012/27/EC

CRU published documents

Transmission System Operator Licence granted to EirGrid

Price Review 5 (2021-2025) CRU/20/154

Government published documents

Climate Action Plan 2024
December 2023

Climate Action Plan 2023
December 2022

Project Ireland 2040
February 2018

Energy White Paper
2015

Government Policy Statement on the Strategic Importance of Transmission and Other Energy Infrastructure
July 2012

Accelerating Ireland's Offshore Energy Programme; Policy Statement on the Framework for Phase Two Offshore Wind
March 2023

Policy statement on the framework for Ireland's offshore electricity transmission system
2021

Energy Security in Ireland to 2030, Energy Security Package
November 2023

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