2 STRATEGIC NEED

2.1 INTRODUCTION

1 This chapter sets out the need and benefits of the proposed interconnector between Ireland and Northern Ireland. The need for a second interconnector arises from the required development of the existing high voltage transmission network infrastructure on the island of Ireland. The chapter concludes by identifying some of the key benefits that the delivery of the proposed interconnector will provide to consumers across the island.

2 The underpinning European, national, regional and local policy context for the proposed development is detailed in a separate *Planning Report* (refer to **Volume 2A** of the application documentation).

3 As noted above, and addressed in more detail also in **Volume 2A** of the application documentation, the proposed interconnector is designated as a Project of Common Interest (PCI). Specifically, Article 4 of the governing Regulation 347/2013[17] - refers to Criteria for Projects of Common Interest, stating:

> *1. "Projects of common interest shall meet the following general criteria:*
>
> *(a) the project is necessary for at least one of the energy infrastructure priority corridors and areas;*
>
> *(b) the potential overall benefits of the project, assessed according to the respective specific criteria in paragraph 2, outweigh its costs, including in the longer term; and*
>
> *(c) the project meets any of the following criteria:*
>
> *(i) involves at least two Member States by directly crossing the border of two or more Member States;*
>
> *(ii) is located on the territory of one Member State and has a significant cross-border impact as set out in Annex IV.1;*

[17] Of the European Parliament and of the Council of *17 April 2013 on guidelines for trans-European energy infrastructure and repealing Decision No 1364/2006/EC and amending Regulations (EC) No 713/2009, (EC) No 714/2009 and (EC) No 715/2009*.

(iii) crosses the border of at least one Member State and a European Economic Area country.

2. The following specific criteria shall apply to projects of common interest falling within specific energy infrastructure categories:

(a) for electricity transmission and storage projects falling under the energy infrastructure categories set out in Annex II.1 (a) to (d), the project is to contribute significantly to at least one of the following specific criteria:

(i) market integration, inter alia through lifting the isolation of at least one Member State and reducing energy infrastructure bottlenecks; competition and system flexibility;

(ii) sustainability, inter alia through the integration of renewable energy into the grid and the transmission of renewable generation to major consumption centres and storage sites;

(iii) security of supply, inter alia through interoperability, appropriate connections and secure and reliable system operation;…"

4 With endorsement from energy regulators and Governments in both jurisdictions the respective applicants have worked jointly to identify and execute proposals for appropriate interconnection between the transmission network in Ireland and Northern Ireland. The new Interconnector will largely remove existing restrictions limiting cross-border power flows between Ireland and Northern Ireland, thus enhancing security of electricity supply throughout the island of Ireland.

5 EirGrid has the exclusive statutory function "*to operate and ensure the maintenance of and, if necessary, develop a safe, secure, reliable, economical and efficient electricity transmission system, and to explore and develop opportunities for interconnection of its system with other systems, in all cases with a view to ensuring that all reasonable demands for electricity are met and having due regard for the environment*".[18]

6 EirGrid also has a licence obligation to develop the Irish transmission system "*as part of an efficient, economical, co-ordinated, safe, secure and reliable electricity transmission system on the Island of Ireland as a whole*[19]*."*

[18] Article 8 of the *European Communities (Internal Market in Electricity) Regulations 2000 (*S.I. No. 445 of 2000).
[19] *Transmission System Operator Licence Granted to EirGrid* - Condition 3 General Functions 1 (a)

7 Relevant considerations arising from this statutory duty and the development context for the proposed interconnector are set out in the following sections.

2.2 EXISTING TRANSMISSION NETWORK INFRASTRUCTURE AND DEVELOPMENT CONTEXT

2.2.1 Existing Electricity Infrastructure

8 The nature of electrical power transmission systems is such that electricity generation and demand must always be balanced, since it is impractical for electrical energy to be stored in bulk quantities. This means that a strategic electricity transmission system must be capable of providing a continuously stable and reliable supply of electricity throughout a wide geographic area, but also capable of immediately coping with significant changes in operating conditions.

9 Transmission systems were originally designed to cater for the receipt of power from a relatively small number of large reliable sources of power generation and to distribute that power to widely dispersed load centres (primarily centres of population). However, the requirements of the modern transmission system have changed. Firstly, to enable use of the cheapest energy sources transmission system capacity needs to be capable of transferring a greater range of power flows between generators and load centres. Secondly, more small-scale and renewable energy-sourced generation is seeking connection to, or use of, transmission systems. Much of this is wind-powered generation, which has intermittent output. Transmission System Operators (TSOs) therefore need to exchange large amounts of power to efficiently manage the variability.

10 The transmission system on the island of Ireland provides a substantial, reliable and proven corridor for balancing bulk power flows and ensuring stable system performance across the entire island. It operates at high voltages, to enable power to be transferred most efficiently, and is designed and constructed to provide a high standard of reliability and dependability. **Figure 2.1** shows the existing transmission networks in both jurisdictions as well as the existing interconnection that runs between Northern Ireland and Scotland and between Ireland and Wales.

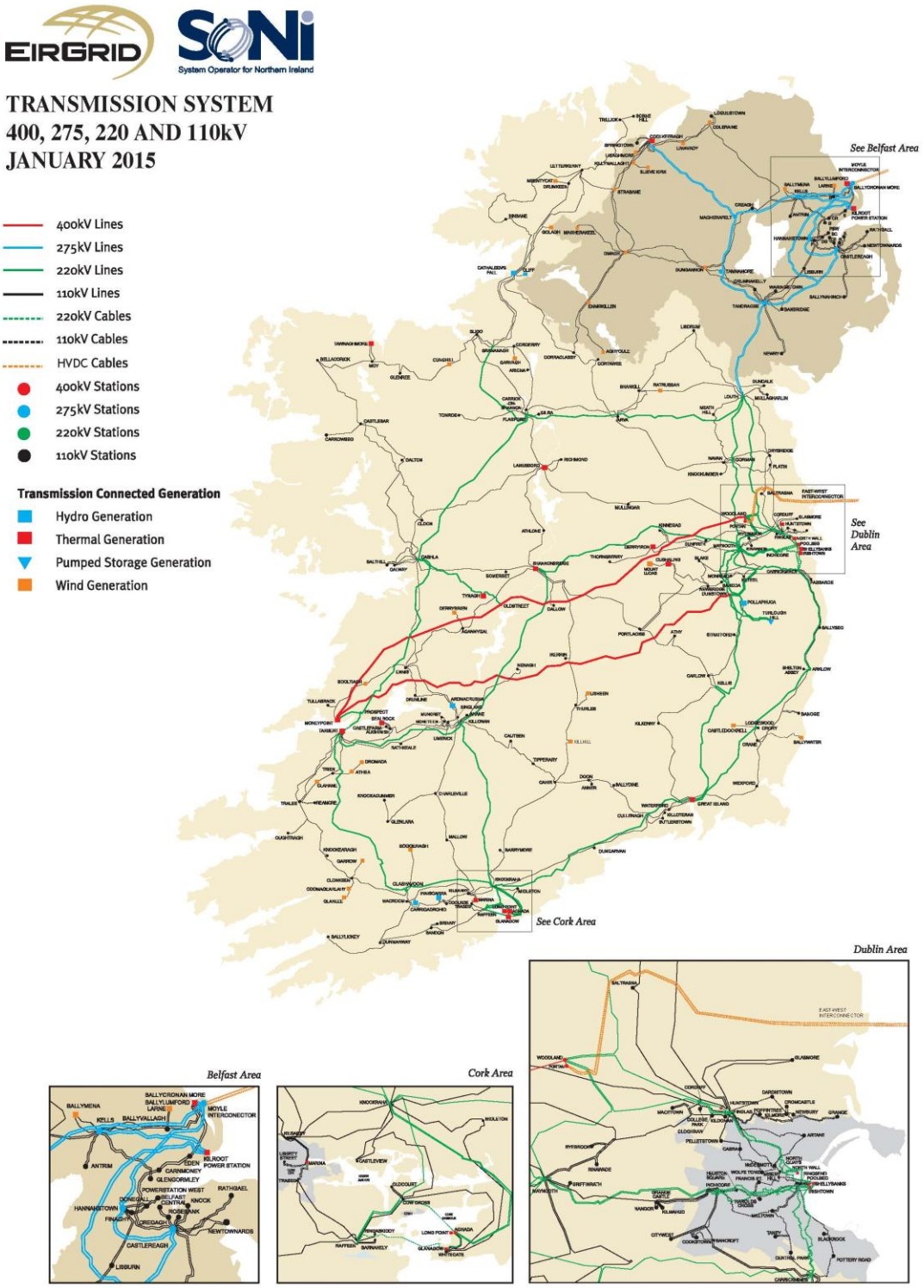

Figure 2.1: Transmission Systems in Ireland and Northern Ireland (2015)

(An A3 version of this map is provided in **Volume 3B Figures**)

2.2.1.1 The Transmission System in Ireland

11 In Ireland the electricity transmission system comprises the following:

- The 400 kV network;
- The 220 kV network; and
- The 110 kV network.

12 The 400 kV and 220 kV networks form the major 'arteries' of transmission infrastructure across the country, facilitating transfers of large amounts of electrical power from the larger power generation sources within Ireland. Transmission of electricity at these higher voltages reduces losses and enables power to be transferred more efficiently than at lower voltages. A high voltage reliable transmission system therefore provides a conduit for bulk power flows, thereby ensuring stable performance across the entire transmission system.

13 The 400 kV network currently comprises two circuits, one connecting Moneypoint Substation on the west coast to Woodland Substation at Batterstown near Dunshaughlin, County Meath, and the other connecting Moneypoint Substation to Dunstown Substation in County Kildare. In addition, the Oldstreet 400 kV Substation, connected into the Moneypoint-Woodland circuit, provides a strong feed to Galway and the West.

14 The 500MW High Voltage Direct Current (HVDC) East-West Interconnector between Wales and Ireland connects into the 400 kV network at Woodland Substation and the proposed interconnector will also connect into the 400 kV network at this node, as it is the most robust in this part of the network in Ireland.

15 The 220 kV network forms a number of largely single circuit loops across the country. The 110 kV network is the most extensive element of the overall transmission system, extending across each county. The high voltage transmission system is almost entirely constructed as overhead line (OHL) infrastructure, with conductors supported on steel lattice towers at the 400 kV and 220 kV voltage level, and supported mostly on wooden pole structures at the 110 kV voltage level. These connect the major switching and voltage management points (substations), which interface at certain substations with the more extensive lower voltage distribution system.

2.2.1.2 The Transmission System in the North-East Area of Ireland

16 The transmission network in the area from Dublin northwards towards County Louth and the border - described as the north-east area for the purposes of the proposed development - is a key strategic corridor which supports security of supply in the region and facilitates the transfer of electricity power to other areas in the country.

17 The existing transmission system in the region comprises two 220 kV lines connecting Dublin to Louth (Louth-Gorman-Maynooth & Louth-Woodland), and a 220 kV OHL from Louth Substation to Flagford in County Roscommon, all as outlined in **Figure 2.1**. These lines have been in service for over 30 years and no new 220 kV lines have been constructed in the north-east area in that time. The underlying 110 kV network also extends from Dublin to Louth Substation. Louth Substation is the main node of electricity supply for counties Cavan, Louth, Monaghan and parts of Meath. Louth Substation also serves as the southern terminus of the existing interconnector between the two jurisdictions.

2.2.1.3 The Transmission System in Northern Ireland

18 In Northern Ireland, the strategic electricity transmission system comprises the following elements:

- 275 kV network; and
- 110 kV network.

19 The bulk transmission system is made up of double circuit OHL (two transmission circuits erected on single steel tower structures), constructed to a 400 kV standard but which is currently operated at 275 kV. The network mainly forms a double circuit loop from a number of power generation stations in the east of Northern Ireland around Lough Neagh. There is a spur from the north-western portion of that loop stretching to Coolkeeragh Substation in County Derry and a second spur running south from Tandragee to form the existing interconnector to Louth Substation. The lower voltage 110 kV network is the most extensive element of the grid; and the transmission system connects to the lower voltage distribution system at substations.

2.2.2 History and Current Operation of Existing Interconnection

2.2.2.1 Existing Interconnection between Ireland and Northern Ireland

20 Until 1970, the electricity systems in Ireland and in Northern Ireland operated separately. When commissioned in 1970, the first interconnector connected the two transmission networks at, what was then, their strongest point - Maynooth, County Kildare and Tandragee, County Armagh. At this time, however, the Electricity Supply Board (ESB) was separately planning a major reinforcement of the transmission network in the north-east area of Ireland, including construction of a new 220 kV / 110 kV substation near the village of Louth in County Louth.

21 Thus, in 1973, after commissioning Louth Substation, the Maynooth-Tandragee Interconnector was diverted into that substation to form the Louth-Tandragee double circuit 275 kV Interconnector, with a nominal capacity of 1,500MW (750MW per circuit), and the Louth-Maynooth 220 kV transmission line. The two other 220 kV lines connecting to Louth Substation, referred to in **Section 2.2.1.2**, were commissioned in the following years to facilitate interconnection transfers and to further enhance connection with the strongest points north of Dublin.

22 In addition, two 110 kV circuits were commissioned in 1994 to provide cross-border support between local networks. One circuit links Letterkenny in County Donegal with Strabane in County Tyrone; the other links Corraclassy in County Cavan with Enniskillen in County Fermanagh. These were originally planned as standby circuits to provide emergency supply to Letterkenny and Enniskillen.

23 The existing 275 kV interconnector operates in parallel with the two 110 kV tie-lines. However, the 275 kV interconnector forms the only effective large scale interconnection pathway between the transmission systems of Northern Ireland and Ireland. The two 110 kV tie-lines do not, on their own, have sufficient power carrying capacity to securely hold the two transmission systems together. A power system protection scheme has therefore been installed to ensure that, should the existing 275 kV interconnector trip due to a fault, or is otherwise put out of service, the two 110 kV interconnectors will automatically trip, thus ensuring that they are not left on their own as the only form of interconnection between the two systems.

2.2.2.2 Existing Interconnection between Northern Ireland and Scotland

24 The existing Moyle HVDC Undersea Interconnector, operating since 2002 and running between Ballycronan More in Islandmagee, County Antrim, and Auchencrosh in Ayrshire, links the electricity systems of Northern Ireland and Scotland. The link has a capacity of 500MW[20]. The operation of the Moyle Interconnector ended the isolation of Northern Ireland – and thus the island of Ireland – from the much larger electricity systems and markets, and indeed, the more diverse range of power generation sources, of Scotland, England, Wales, and the European mainland.

2.2.2.3 Existing Interconnection between Ireland and Wales

25 The East-West Interconnector links the electricity systems of Ireland and Britain and has been in operation since 2012. It runs between Woodland Substation in County Meath and Deeside in North Wales. It is a 260km HVDC underground and undersea link with the capacity to transport 500MW of electricity.

2.2.3 Transmission System Needs

2.2.3.1 Limitations of Existing Interconnection between Ireland and Northern Ireland

26 Having regard to the nature and extent of the existing interconnection infrastructure between Ireland and Northern Ireland, there is a risk that a single event – such as a lightning strike, accidental or deliberate damage to a tower structure, a fire at one of the termination points, or a mal-operation of the complex power system protection schemes - could cause a trip of the existing double circuit 275 kV interconnector between Louth and Tandragee. In such a scenario, interconnection between the transmission systems of Ireland and Northern Ireland would be lost entirely. This scenario is known as 'system separation'; in this situation, the transmission systems in Ireland and Northern Ireland would revert to operating independently of each other. This could result in loss of load in either or both systems as power transfer and mutual support cannot occur.

27 System separation, depending on the pre-separation interconnector flows, will result in a generation surplus in one system and a deficit in the other. The system with the deficit may be required to disconnect demand customers; the system with the surplus may have difficulty

[20] The Moyle Interconnector is currently limited to a capacity of 250MW due to a cable fault. Repairs are currently being planned to return the Interconnector to full capacity at a future date.

stabilising the system frequency. Both systems must be capable of dealing with this contingency and this puts a limit on the power transfer which the systems can cater for with the existing interconnection.

28 The respective applicants are obliged, by licence, to design the transmission systems of the two jurisdictions to be robust against a single event that would cause the quality of the electricity supplied to customers to deviate from specified quality standards. With the current extent of interconnection infrastructure between the two networks, it is possible for a single event to result in system separation. It is necessary, therefore, that the two networks are able to withstand, at all times, the sudden and unexpected loss of interconnection. The consequence of this is that under the circumstances where the existing interconnector would be required to be utilised close to its capacity, an unexpected system separation would result in an unsustainable imbalance between the quantity of electricity generation and demand in one or both networks. If such an imbalance is not corrected quickly enough (i.e. within a matter of seconds) then one or both power systems will potentially collapse resulting in black-outs. Correction is normally achieved by automatic load shedding – i.e. automatically switching off large numbers of customers - on the network with the excess demand, and automatically reducing generation on the network with the excess generation.

29 In the context of such a risk scenario the TSOs have agreed that the quantity and direction of power flow on the interconnector – the Total Transfer Capacity (TTC) - be constrained below the level at which system stability can be ensured following an unexpected system separation. Therefore, while each of the two circuits of the existing 275 kV interconnector could in theory carry power flows up to 750MW, the actual TTC of the Interconnector is limited to approximately 450MW. This limitation creates a bottleneck in the network. The capacity available for economic power flows is less than this TTC limit as some capacity must be maintained for emergency response between the two systems. In addition, there may at times be other bottlenecks (e.g. during transmission maintenance outages) in the networks that will also limit flows in either jurisdiction. This bottleneck, seriously limits the scope for commercial exchanges of electricity between generators and suppliers in each part of the all-island electricity market, and leads to inefficiencies and costs that are passed through to final customers as part of their electricity prices. Such a limitation restricts the efficient operation of the interconnector and the attainment of the obligations of Directive 2009/72/EC or the Third Electricity Directive, which establishes *Common Rules for the Internal Market in Electricity* (refer to the *Planning Report*, **Volume 2A** of the application documentation).

30 To address the power flow limitations described above, increasing the capacity of the existing 275 kV double circuit the proposed second interconnector needs to be physically separate from the existing interconnector so that the risk of concurrent failure will be low. Operating the transmission system with both interconnectors in service will provide enhanced security of

supply in the event of the failure of either interconnector because the interconnector which remains in service can instantaneously accept the additional power flow so that there is no resulting instability in system behaviour, or loss of supply to customers.

2.2.4 Electrical Power Carrying Requirements

2.2.4.1 Background to Identifying the Electrical Power Carrying Requirements for the Proposed Interconnector

31 In February 2005 ESB National Grid (ESBNG) and NIE presented a paper titled *Additional Interconnection between Northern Ireland and the Republic of Ireland - Selection of Preferred Option* to their respective Regulatory Authorities. This paper considered the transmission system limitations and needs as described under **Section 2.2.3** and recommended the selection of a development option comprising a 400 kV OHL with an ultimate capacity of 1,500MW. The recommendation was accepted by both Regulatory Authorities and ESBNG was directed by the Commission for Energy Regulation (CER) in March 2006 to carry out the necessary studies, route investigations and other investigations required for the preparation and submission of a planning application, on that basis.

2.2.4.2 Electrical Power Carrying Requirements for the Proposed Interconnector

32 It is considered by the respective applicants that the appropriate nominal electrical carrying capacity requirement for the proposed interconnector is 1,500MW[21]. This is supported by the following:

- The proposed interconnector will form a link between the 400 kV network in Ireland and the double circuit 275 kV network in Northern Ireland. The nominal capacity of the circuits that form these 400 kV and 275 kV networks is 1,500MW.

- The nominal capacity of the existing north-south interconnector is 1,500MW[22]. The proposed interconnector will form a second north-south interconnector and operate in parallel with the existing interconnector. A nominal capacity of 1,500MW will therefore match that of the existing interconnector.

[21] MVA (megavolt-amperes) is the technically correct unit of measurement for describing the capacity of transmission circuits and power transformers, and is the product of voltage (V) and current (A for amperes / amps). It has however become customary in non-technical documents to use MW for this purpose; therefore in this context, MW shall be interchangeable with MVA for the purpose of this chapter.
[22] Although the existing 275 kV double circuit OHL has a nominal capacity of 1,500MW the transformers at the Louth Substation end have a combined capacity of 1,200MW.

- Studies also show that powerflows of up to 1,100 MW would be anticipated if the present limitations imposed on the TTC were to be withdrawn. It is therefore prudent to design for 1,500 MW, that is 1,100 MW plus a margin for future growth.

2.3 BENEFITS OF THE PROPOSED INTERCONNECTOR

33 The respective applicants are satisfied that the development of an additional high-capacity electricity interconnector between the electricity networks of Ireland and Northern Ireland is required in order to comply with, and to implement, the obligations of EU and national energy policy guidelines. The proposed interconnector provides many technical and other benefits which support the delivery of the key policy objectives of competitiveness, sustainability and security of supply for both Ireland and Northern Ireland. At present, in order to ensure system stability across the island of Ireland, power flows on the existing interconnector are limited to a value well below its nominal capacity. This limit is applied due to the potential impact on security of supply if an unexpected outage of the existing interconnector arises at higher power flows leading to unacceptable voltage and frequency stability issues. The second north-south interconnector will help to resolve this risk, as it provides a separate power flow independent of the existing interconnector, which significantly reduces the risk of system separation.

34 There are a number of benefits which arise as a result of the removal of existing constraints on power flow transfers between Ireland and Northern Ireland. These benefits include:-

2.3.1 Improving Competition by Reducing the Constraints Restricting Efficient Performance of the All-Island Single Electricity Market

35 In Ireland and Northern Ireland, as in other EU countries, domestic and commercial customers were historically restricted to a monopoly supplier of electricity, with no competition in the electricity supply market place. The All-Island Project is a joint initiative run by the CER and the Northern Ireland Authority for Utility Regulation (NIAUR). The aim of the project is to create a single market for natural gas and electricity on the island of Ireland. The all-island Single Electricity Market (SEM)[23] was successfully established in November 2007, commencing the trading of wholesale electricity in Ireland and Northern Ireland on an all-island basis. The aim of

[23] The SEM is the electricity market structure currently in place on the Island of Ireland. This market structure is due to transition into that of the I-SEM which will allow integration with the European Target model. This is scheduled to happen in 2017. The aims of both market structures are fundamentally the same.

the Single Electricity Market is to promote cross border trading in electricity for the benefit of all consumers on the island of Ireland.

36 The absence of a second north-south interconnector at present means that a significant infrastructure bottleneck exists that restricts power flows between the two systems. The efficient operation of the electricity market on the island of Ireland requires an adequate and appropriate linkage of the separate transmission networks in such a way that they operate as a single synchronised transmission network. To achieve this, the level and reliability of interconnection must be such that the demand for cross border power flows can be met at all times even during system disturbances. As described in **Section 2.2.3.1**, to manage the risk of system separation, power transfers on the existing interconnector are currently limited to the level where the generation / load imbalance resulting from system separation can be managed by both systems. The existing reliance on a single interconnector is considered a significant constraint to ensuring an efficient electricity market. The constraint creates inefficiency in the market, due to the operational limits on transfer capacity and therefore excess cost for customers because it prevents the most efficient generators having unconstrained access to the market at all times.

37 With the present low level of interconnection, electricity cannot be traded in an effective way to facilitate the full benefits that the all-island single electricity market should bring to customers. The construction of an additional high capacity interconnector will diminish the possibility of system instability arising from the failure of one interconnector to an acceptable level; consequently, the transfer limit across the interconnector can be increased towards its nominal capacity, thereby permitting greater trade in electrical power, and enhanced security of supply. An additional benefit of enhanced high voltage interconnection is that the existing 110 kV tie-lines could be used more fully and would not automatically have to be removed from service in the scenario of an outage of the existing 275 kV interconnector, as is currently the case.

38 By reducing the existing infrastructure constraint between both jurisdictions, the second interconnector would remove this unnecessary congestion and as noted in the letter[24] to EirGrid from the SEM Committee dated 18th May 2015, would allow the all-island single electricity market to operate more efficiently, in line with its design objectives[25]. Studies by EirGrid and SONI have calculated annualised benefits to the market from the delivery of the second north-

[24] See Volume 3B Appendices, *SEMC to EirGrid plc Re North South Interconnector.*
[25]The key SEM Objectives are set out at http://www.allislandproject.org/GetAttachment.aspx?id=5d50b98a-5aef-47e1-a3f7-904cc7aeac9e.

south interconnector of the order of €20m per annum in 2020 rising to a range of between €40m and €60m by 2030[26].

2.3.2 Improving Security of Supply by Providing a Reliable High Capacity Link between the Two Parts of the All-Island Transmission System

39 Due to the restrictions in the available transfer capacity of the existing interconnector, the level of security of supply support that can be provided by each system to the other is significantly limited. Previous Generation Capacity Statements[27] published jointly by EirGrid and SONI have highlighted how, for Northern Ireland, with this limited support, the availability of generation to meet forecast demand would be subject to significant risk from 2016.

[26] See *The Need for a Second North South Electricity Interconnector*, **Appendix 2.1**, **Volume 3B Appendices,** of the EIS. This paper describes the detailed calculation of associated benefits for the project.
[27] http://www.eirgrid.com/media/Generation%20Capacity%20Statement%202014.pdf

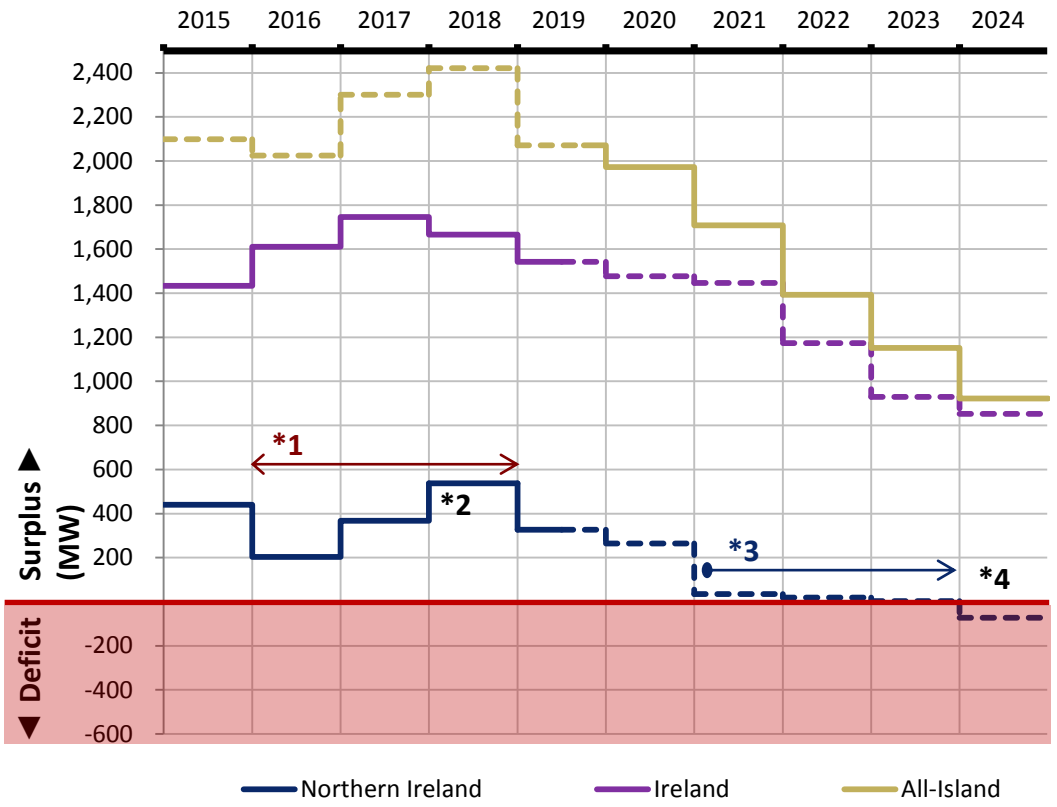

Figure 2.2: Forecasted Generation Capacity Adequacy on the Island of Ireland, 2015-2024

Note *1: Local Reserve services contract from 2016-2018 (inclusive)

Note *2: Moyle full capacity restored in 2018

Note *3: Kilroot coal units severely restricted from 2021

Note *4: Kilroot coal units shut in 2024

Source: *All-Island Generation Capacity Statement 2015-2024*

40 SONI has taken action to address the risk to Northern Ireland security of supply post 2016. Following a competitive procurement process, a contract has been signed between SONI and AES Ballylumford for the provision of 250 MW of local reserve services for a three-year time period commencing 1st January 2016, with an option to extend for a further 2 years. This contract has secured the continued operation of two of the steam units at Ballylumford at a slightly reduced capacity.

41 The graph in **Figure 2.2** combines a number of assessments of generation adequacy between 2015 and 2024. The purple line presents the results of a separate generation adequacy study for Ireland and the blue line presents the results of a separate generation adequacy study for Northern Ireland. The Ireland results are for that jurisdiction on its own, i.e. for the Ireland generation plant to meet the demand forecast in Ireland, without the additional north-south interconnector but with a 100MW reliance on Northern Ireland through the existing interconnector. Similarly the Northern Ireland study results are for that jurisdiction on its own, i.e. without the additional north-south interconnector and with a 200MW reliance on Ireland.

42 In addition to these two separate studies, an assessment has also been carried out to show the generation adequacy situation on an all-island basis, with all of the generation on the island being employed to meet the combined load forecast. This is indicated by the solid gold line. This assumes that the additional north-south interconnector is in place by the end of 2019.

43 For completeness, the single-area studies for Ireland (purple) and Northern Ireland (blue) have been continued beyond 2019 (and shown as dashed lines) to illustrate the situation should the interconnector project be delayed. Similarly, as the results for the combined, all-island system (gold) are only applicable once the second interconnector is in place from late 2019 onwards, all-island adequacy results are also shown before late 2019 (gold dashed lines) to convey the situation should the interconnector be completed early. The benefit of this approach is that it allows a full consideration of the impact that the second north-south interconnector has on both jurisdictions over the entire period of generation adequacy assessment (2015-2024).

44 The graph illustrates how, with the addition of the local reserve services contract in 2016 and the restoration of the Moyle Interconnector to full capacity in 2018, the capacity situation in Northern Ireland is adequate up to the end of 2020 (blue line). Emissions restrictions on the generating station at Kilroot have a severe impact of system adequacy from 2021 onwards, resulting in significant risk to the security of supply in Northern Ireland if the second north south interconnector is not in place

45 With the second north-south interconnector in place (gold line), the Northern Ireland security of supply situation, as part of the combined all-island system, is no longer at risk. This highlights the importance of the proposed interconnector to maintain security of supply in Northern Ireland and also demonstrates the enduring security of supply benefit to consumers across the island in the longer term.

2.3.3 Supporting the Development of Renewable Power Generation by Enhancing the Flexible Exchange of Power Flows over a Large Area of the Island

46 In response to Article 4 of *Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources* [the Renewable Energy Directive], (refer to the *Planning Report,* **Volume 2A** of the application documentation for details), the Government of Ireland has submitted a *National Renewable Energy Action Plan (NREAP)* to the EU Commission. Northern Ireland contributes to the United Kingdom NREAP. The Government of Ireland and the Government of Northern Ireland have set clear policies for increasing the energy delivered from renewable energy sources on the island of Ireland. In Northern Ireland DETI is giving consideration to arrangements that will apply after the cessation of the present NIRO arrangements which could have an impact on the level of renewables that will come forward in Northern Ireland. However, there is certainty that there will be a substantial amount of renewable generation connected in Northern Ireland before 2017 and in combination with the other significant drivers for the second North-South interconnector including enhanced security of supply and greater efficiency in the all island electricity market, the case of need for the proposed interconnector remains strong.

47 The geography and topography of the island of Ireland is such that both jurisdictions have substantial potential wind energy resources. The development and exploitation of these resources is expected to bring significant benefits to both economies, whilst improving the overall diversity of supply, reducing dependence on imported fossil fuels and decreasing CO_2 emissions in the power sector. In order to meet 2020 Renewable Energy Sources for Electricity (RES-E) targets in Ireland and Northern Ireland, it is projected that the amount of wind generation across the island of Ireland will reach an installed capacity of between 4,400MW and 4,900MW by 2020.[28] At these levels, Ireland and Northern Ireland will have one of the highest penetrations of wind generation, as a percentage of system size, in the world. A key constraint to the practical development of wind powered generation is the ability of the existing transmission systems to absorb and manage this form of power generation.

48 The second north-south interconnector contributes to this objective by resolving the power transfer limitations that currently exist between both power systems. Resolving this power transfer issue will allow a re-consideration of a wide variety of operational metrics on an all-island basis. These operational metrics include synchronising torque, inertia, dynamic reactive power and reactive power. The ability to share these characteristics on an all-island basis not

[28] *All Island Generation Capacity Statement 2014-2023.*

only mitigates system separation but also enhances the capability of incorporating significantly greater volumes of RES-E than either system on its own could securely and efficiently manage.

49 The addition of the second interconnector therefore significantly contributes to power system stability on the island as the level of RES-E installed on the island increases to meet the future renewable targets in Ireland and Northern Ireland.

2.3.4 Reinforcement of the North–East Area of Ireland

50 During public consultation in respect of the previous application for approval of the Meath-Tyrone 400 kV Interconnection Development, the 'need' for the development was, understandably, questioned in light of the decline in electricity consumption as a result of the economic downturn. The recent economic downturn commenced in the second half of 2008. It resulted in a significant and general decline in electricity consumption in Ireland. However, it is clear from the above sections, that the drivers for the establishment of a second north–south interconnector are not diminished to any material degree by the decline in national electricity consumption that has resulted from the economic downturn. The decline in electricity consumption in the north-east area of Ireland has, however, an obvious and significant effect on the need from a security of supply perspective for the reinforcement of the transmission network in that specific area.

51 As part of the re-evaluation of the proposed interconnector, which has been undertaken since the withdrawal of the previous planning application in June 2010, EirGrid has routinely re-examined the security of supply risk in the north-east area in light of the economic downturn. Using the median demand forecasts from the *All Island Generation Capacity Statement 2015–2024,* it was found that the peak demand in the area will still be below the critical level for beyond the current planning horizon (more than 10 years). Therefore, unless there is a stronger recovery in the economy in the area and / or one or more new large industrial consumers emerge, reinforcement of the network in the area for security of supply reasons is not likely to be required within the next ten years.

52 Although the need to reinforce the north-east area of Ireland for security of supply reasons is no longer an immediate driving factor for the delivery of the proposed interconnector (as that reinforcement is not now expected to be required for at least a decade), the presence of the interconnector will nevertheless provide reinforcement to the area by providing an additional high capacity circuit in the region, thus reducing flows on the existing circuits. Based on current predictions, such reinforcement will provide sufficient additional transmission capacity in the area to cater for growth in electricity consumption for many years and will also put the north-east area in a good position if an even stronger economic recovery should emerge in the coming years.

2.4 CONCLUSION REGARDING THE STRATEGIC NEED FOR THE PROJECT

53 It is a fact that both the CER and NIAUR have recommended that there exists a sound economic and strategic case for an additional high capacity interconnector linking the electricity transmission systems of Ireland and Northern Ireland. This recommendation has been endorsed by the two Governments of these jurisdictions[29].

54 The re-evaluation process (2010–2013) reconsidered the strategic need, rationale, justification and benefits of the interconnection development. It considered a range of benefits which underline the need for the proposed interconnector and the national and European Union (EU) policy objectives which support their effective delivery. The re-evaluation process also considered alternative options (including those raised by third parties during consultation) and explains why the second north-south interconnector is the only option that will fully address the strategic need identified.

55 The findings of the re-evaluation process concluded that:

- There remains a clear and immediate strategic need for a second north-south interconnector;
- A new and physically separate high capacity cross border interconnector circuit, connecting between appropriately robust parts of the two existing transmission networks north and south of the border, is the only option that will satisfy the identified strategic need; and
- An additional north–south interconnector ensures that the security of supply position in Northern Ireland is fully compliant with the generation adequacy standard for all study years covered in the latest *All-Island Generation Capacity Statement.*

56 The proposed interconnector will overcome the risk of system separation and, together with associated system reinforcement, will increase transfer capacity between the two systems. This will have the strategic benefits of improving market competition in the context of the SEM, of supporting the development of renewable power generation, and of improving security of supply.

[29] CER and NIAUR assessment and evaluation - *Joint Report For the Case For a Second North-South Interconnector* Joint Government Endorsement*: All-Island Energy Market – A Development Framework*, p5, p10.

57 The resulting increase in cross-border interconnection capacity will allow consumers and producers on the island of Ireland to fully benefit from the SEM with savings of approximately €20m in 2020 rising to a range of between €40m and €60m by 2030. More recently, the need for the project is outlined in EirGrid's *Your Grid, Your Views, Your Tomorrow - A Discussion Paper on Ireland's Grid Development Strategy* published on 27th March 2015. This document takes into account the most up-to-date information available, including *inter alia* future economic and demand projections.

58 The benefits of the proposed development are set out on pages 34 – 35 of Appendix 1 of the document and confirm the benefits in terms of:

- Improving competition and economic operation of generators by removing constraints on power flows across the border;
- Improving security of supply by allowing greater sharing of generation across the island;
- Providing the required flexibility for renewable generation; and
- Ensuring the long-term security of supply for the North-East part of the network of Ireland.

59 The need case for the project was also confirmed by external reviewers (i.e. London Power Associates (LPA)). This LPA report entitled *External Peer Review of Grid 25 Review (2015) for EirGrid*, is included as Appendix 2 to the discussion paper.

60 *Your Grid, Your Views, Your Tomorrow - A Discussion Paper on Ireland's Grid Development Strategy* and all associated appendices is included in **Volume 3B Reference Material**, of the EIS.