

5 INTERCONNECTION WITH OTHER SYSTEMS

The national grid is electrically interconnected with Northern Ireland, which is in turn interconnected with Scotland via the Moyle submarine interconnector. This chapter describes the existing interconnector and discusses plans for future interconnections with Northern Ireland and Britain.

5.1 INTERCONNECTION WITH NORTHERN IRELAND

5.1.1 The Existing Interconnection

There have been no changes to the existing interconnections with Northern Ireland (NI) since *Forecast Statement 2004-2010*.

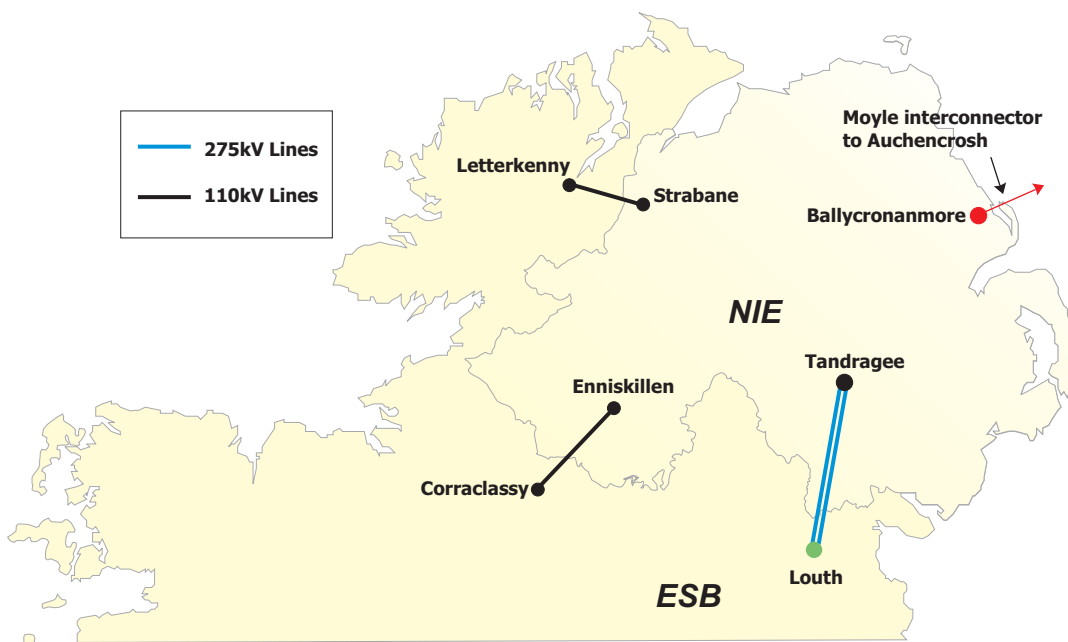


Figure 5-1 Interconnections with Northern Ireland

The main interconnector with Northern Ireland connects Louth station to Tandragee in County Armagh. The physical interconnection consists of three 275⁹/220 kV transformers in Louth station, one 600 MVA unit and two ganged¹⁰ 300 MVA units, connected to a double circuit 275 kV line from Louth to Tandragee in Northern Ireland. In addition to the main 220/275 kV interconnector, there are two 110 kV connections, one between Letterkenny in County Donegal and Strabane in County Tyrone (NI), and the other between Corraclassy in County Cavan and Enniskillen in County Fermanagh (NI). The purpose of these 110 kV interconnections is to provide support to either system for certain conditions or in the event of an unexpected circuit

⁹ The transmission system in Northern Ireland is designed at 275 kV and 110 kV.

¹⁰ Connection in parallel through common switchgear.

outage. Phase shifting transformers in Strabane and Enniskillen are used to control the power flow under normal conditions.

In the event of a loss of both circuits of the main 220/275 kV interconnector, the pre-fault transfers would be directed across the 110 kV interconnections. In this instance, to guard against damage to these lines, protection equipment will switch out the 110 kV interconnections resulting in separation of the two systems. System separation, depending on the pre-separation interconnector flows, will result in a generation surplus on one system and a deficit in the other. The system with a supply deficit may be required to disconnect demand customers. The system with the supply surplus may have difficulty stabilising the system frequency. Both systems must be capable of dealing with this contingency.

While the design capacity of each of the 220/275 kV interconnectors is 600 MVA, the actual transfer capacity between the two systems at any time will depend on the prevailing system conditions on both sides of the interconnection, including the ability to deal with system separation.

5.1.2 Future Interconnection with Northern Ireland

ESB National Grid and Northern Ireland Electricity (NIE) have carried out investigations examining options for increasing the interconnection capacity between the two systems. The investigations highlight that power transfers between the two systems may be limited by network capacity in both grids and the system separation issue described in Section 5.1.1. Both internal reinforcement and a new 275 kV cross-border interconnector would be required to increase interconnection transfer capability beyond existing limits.

ESBNG and NIE presented these findings to the regulators in the two jurisdictions. Both regulators recommended that there is a sound economic and strategic case for a further interconnector. The ministers have endorsed this recommendation. The regulators have asked ESBNG and NIE to progress further interconnection. The new cross-border interconnector being planned will overcome the system separation problem and, together with other reinforcements, will increase transfer capacity between the two systems. The time scale for further interconnection is of the order of seven to eight years which is at or beyond the end of the period studied in this Forecast Statement. At the time of the data freeze, these plans were not at the stage of maturity required to include in the analysis for the Forecast Statement.

5.1.3 Transfers over the Interconnector

The original purpose of the main interconnector was (a) to share spinning reserve between the two systems, facilitating cross-border rescue flows in the event of a sudden loss of generation in either system, and (b) to facilitate limited opportunistic transfers between the two TSO's. Traditionally the two systems were designed to be self-reliant; transfer capability across the

interconnector was not specifically planned for, nor did transfers have firm capacity on the network.

The liberalisation of the market in the two jurisdictions has led to expectations of increased availability of interconnector capacity for market participants. Market participant trading has been supported through capacity auctions and energy nominations. While there are physical limits on the amount of trade possible in both directions, superposition provides market flexibility i.e., trades and counter trades are permissible in both directions provided that the physical flow does not exceed available capacity.

The availability of capacity on the interconnector for physical trades is affected by existing reserve-sharing agreements and the system development principles adopted by both systems. Chapter 10 deals with the capability of the national grid to allow interconnector transfers.

The Minister for Communications, Marine and Natural Resources, Noel Dempsey TD, and his Northern Ireland counterpart, Barry Gardiner MP, Minister for Enterprise, Trade and Investment, reaffirmed their respective Governments' commitment to an all-island energy market on 23rd November 2004. They jointly released a document entitled the "*All-Island Energy Market Development Framework*", which provides the strategic blueprint for creation of an all-island energy market. The current bilateral trading model in Ireland will be replaced by an all-island mandatory pool spot market. Further details can be found on the All Island Project website, www.allislandproject.org.

Any new trading regime is not expected to take effect until at least 2007. At this time the interconnectors will effectively become internal circuits in the new market.

5.2 IRELAND-BRITAIN INTERCONNECTOR

The potential of an interconnector between Ireland and Wales was the subject of studies by ESB National Grid, as TSO, and National Grid Company, UK, in the early 1990s and reviewed in 2002. These studies identified a number of technically viable options for interconnection.

The Commission for Energy Regulation (CER) commissioned DKM Economic Consultants to carry out a separate economic study into the case for an east-west interconnector between the Irish and British electricity systems. The study focused on the potential benefits to the national economy and, in particular, the long term interests of the Irish electricity consumer.

The study report indicated that the distance would require DC (direct current) cabling, that the appropriate capacity would be about 500 MW and that the submarine cabling and convertor stations alone would cost approximately €185m. The benefits for Ireland would be in reduced generation investment, sharing of reserve costs and some trading gains from increased competition.

In 2004, the then Minister for Communications, Marine and Natural Resources, Mr Dermot Ahern TD, announced that he had received approval from Government to develop a project for two 500 MW electrical interconnections between Ireland and Wales.

The Minister requested the CER to assess the commercial interest in such a project. Following submissions from interested parties, the CER decided that the project would have to be funded through a combination of public and private partnership. In March 2005, the CER appointed a team of consultants led by KPMG to advise it in relation to procuring interconnection.

The import and export capabilities were examined at nine potential points of interconnection with Britain. The results of this analysis is presented in Chapter 10.