

## 10 NETWORK CAPABILITY FOR INTERCONNECTOR TRANSFERS

The analyses to determine the capability of the grid to transfer power across the existing interconnector with Northern Ireland and at potential points of interconnection with Britain were explained in Chapter 7. This chapter presents the results of the transfer capability analyses and highlights the opportunities for export and import power transfers with both Northern Ireland and Britain. The capability of the networks in Northern Ireland and Britain to cater for these transfers was not assessed in these studies. For information on the systems in Northern Ireland and Britain, users should contact the system operators, System Operator Northern Ireland (SONI) and National Grid Transco (NGT).

**The results in this chapter are dependent on the assumptions made about generation and demand, and on the completion dates of transmission reinforcement projects as described in previous chapters.**

The results in this chapter are classified as

- very high      more than 400 MW
- high            between 250 and 400 MW
- medium        between 100 and 250 MW
- low             less than 100 MW.

The figures in brackets in the tables provide a cross reference between the medium or low transfer capability and the relevant system bottleneck listed in Table F-1 in Appendix F.

### 10.1 TRANSFER CAPABILITY RESULTS FOR INTERCONNECTION WITH NORTHERN IRELAND

It is important to draw attention to the various definitions of transfer capability. The analysis in this Forecast Statement calculates the total transfer capability (TTC), which is the total capability of the network to accommodate all transfer flows, including emergency flows, that would occur after a contingency in either system. The Market Data posted on the TSO's website ([www.eirgrid.com](http://www.eirgrid.com)) includes figures for the Net Transfer Capacity (NTC) for both imports and exports across the interconnector. The NTC is the capacity available for trading after allowance has been made for a margin, known as Transmission Reliability Margin (TRM), to ensure that the interconnected network will be secure. The margin allows for sharing of operating reserve between the two systems. The TRM is presently 240 MW for exports to Northern Ireland and 180 MW for imports from Northern Ireland but can change depending on system conditions. The TTC is the equivalent of the NTC plus the TRM.

As discussed in Section 7.3 of Chapter 7, power imported across the main interconnector at Louth replaces generation elsewhere in the system. Therefore, the capability of the network to

transfer power from Louth to existing areas of generation in Dublin, the south-west, the mid-west (Moneypoint and Tynagh) and the south-east was analysed. Exports to Northern Ireland are achieved by an increase in generation in this system and a corresponding reduction of generation in Northern Ireland. Therefore, the export capability analysis was tested at the same fifteen 220 kV stations that were examined for generation.

The results for import and export transfers on the existing interconnector are presented in Table 10-1 and Table 10-2. Results are shown for 2008 and 2011. Transfer capabilities for 2005 are available in the market data download centre on [www.eirgrid.com](http://www.eirgrid.com).

Where there is a dash symbol in Table 10-1, transfers to the south-east are not limited by the network because all generation in the south-east may be replaced by new generation imported from Northern Ireland, without violating the transmission planning criteria.

Table 10-1 Total Transfer Capability for Imports from Northern Ireland in 2008 and 2011

Import TTC		Transfer from NIE	
		2008	2011
Transfer To	Dublin	Very High	Very High
	South-West	Low (6)	Low (9)
	Mid-West	Very High	Very High
	South-East	Low (5)	-

The results show that the Crane-Wexford 110 kV line (9) limits imports that replace generation in the south-west. A sensitivity analysis was carried out to assess the impact on the 2011 results of uprating the Crane-Wexford 110 kV line. The results showed an improvement opportunity for imports that replace generation in the south-west improves.

Table 10-2 Total Transfer Capability for Exports to Northern Ireland in 2008 and 2011

Export TTC		Transfer to NIE	
		2008	2011
Transfer From	Carrickmines	Low (6)	High
	Finglas	Low (6)	High
	Maynooth	Low (6)	Very High
	Clashavoon	High	High
	Knockraha	High	High
	Killonan	Very High	Medium (12)
	Tarbert	High	High
	Arklow	Low (6)	Medium (9)
	Cullenagh	High	High
	Great Island	Very High	High
	Shannonbridge	High	Medium (12)
	Cashla	Medium (5)	Very High
	Flagford	Very High	Very High
	Gorman	Very High	Very High
Louth	Very High	Very High	

## 10.2 TRANSFER CAPABILITY RESULTS FOR INTERCONNECTION WITH BRITAIN

The nine potential connection points studied for the proposed Ireland-Britain interconnector are shown on the map in Figure 10-1. The results for import and export transfers are shown for 2008 and 2011 and presented in Table 10-3 to Table 10-6.



Figure 10-1 Stations Analysed as Potential Points of Interconnection with Britain

Whereas the transfer capability analysis for transfers with Northern Ireland are across a known interconnector at Louth, the analysis for Britain involves testing transfer capability at nine different potential connection points. The results tables for imports and exports with Britain are therefore different to those with Northern Ireland.

In Table 10-3 and Table 10-4 the stations in the first column are the potential connection points. The results for each potential connection point give the transfer capability for imports from Britain when replacing generation at Dublin, the south-west, the south-east and the mid-west. Where there is a dash symbol in the tables, transfers to the south-east are not limited by the network because all generation in the south-east may be replaced by new generation imported from Britain, without violating the transmission planning criteria.

Table 10-3 Total Transfer Capability for Imports from Britain in 2008

Import at:	Replaced Generation at:			
	Dublin	South-West	South-East	Mid-West
Louth	Very High	Low (6)	Low (5)	Very High
Gorman	Very High	Low (6)	Low (6)	Very High
Woodland	High	Low (6)	Low (6)	Very High
Finglas	Very High	Low (6)	Low (6)	High
Carrickmines	High	Low (6)	Low (6)	Medium (9)
Arklow	Very High	Low (1)	High	Medium (11)
Great Island	High	Low (1)	High	High
Cullenagh	High	Very High	-	High
Knockraha	High	Very High	-	High

Table 10-4 Total Transfer Capability for Imports from Britain in 2011

Import at:	Replaced Generation at:			
	Dublin	South-West	South-East	Mid-West
Louth	Very High	Low (9)	-	Very High
Gorman	Very High	Low (9)	-	High
Woodland	Very High	Low (6) (9)	Low (9)	Very High
Finglas	Very High	Low (6) (9)	Low (9)	Very High
Carrickmines	High	Low (6) (9)	Low (9)	Low (9)
Arklow	Very High	Medium (1) (9)	High	High
Great Island	Very High	Medium (1)	-	High
Cullenagh	Very High	High	-	High
Knockraha	High	Very High	-	Low (3)

Similarly, in Table 10-5 and Table 10-6 the stations in the first column are the potential connection points. The results for each potential connection point give the transfer capability for exports to Britain when increasing generation at Dublin and the south.

Table 10-5 Total Transfer Capability for Exports to Britain in 2008

Export at:	Increased Generation at:	
	Dublin	South
Louth	Low (6)	Very High
Gorman	Low (6)	Very High
Woodland	Very High	Very High
Finglas	Very High	High
Carrickmines	Medium (11)	Medium (11)
Arklow	Low (11)	Medium (11)
Great Island	Low (6)	Very High
Cullenagh	Low (6)	Medium (1)
Knockraha	Low (6)	Medium (7)

Table 10-6 Total Transfer Capability for Exports to Britain in 2011

Export at:	Increased Generation at:	
	Dublin	South
Louth	Very High	Very High
Gorman	Very High	Very High
Woodland	Very High	Very High
Finglas	Very High	Very High
Carrickmines	Medium (11)	Medium (11)
Arklow	Medium (11)	Medium (11)
Great Island	Medium (11)	Medium (9)
Cullenagh	Low (9)	Medium (9)
Knockraha	Medium (9)	Medium (8)

### 10.3 OPPORTUNITIES FOR TRANSFERS ON INTERCONNECTOR WITH NORTHERN IRELAND

Interconnection transfers are dependant on the prevailing system conditions on either side of the interconnector.

The results show there is considerable network capability in the grid to accommodate imports from Northern Ireland that replace generation in Dublin or the mid-west (Moneypoint and Tynagh). The risk of system separation and the capability of the grid in Northern Ireland were not taken into account in the analysis, therefore very high transfers may not be feasible. Imports that replace generation in the south in 2008 are low and limited by the Galway-Clare bottleneck. Following the construction of the Moneypoint-Tarbert cable in the interim, this bottleneck is alleviated by 2011. In 2011, all generation dispatched in the south-east can be replaced by generation imported from Northern Ireland, without violating the transmission planning criteria. Imports that replace generation in the south-west are limited by the Crane-Wexford 110 kV line. A sensitivity analysis, with the Crane-Wexford 110 kV line uprated, was carried out on the 2011 results. The analysis indicated that the opportunity for imports that replace generation in the south-west improves with this uprating.

The capability to export is high or very high at 10 of the 15 stations analysed in 2008. Following the construction of the Moneypoint-Tarbert cable, there is opportunity for high or very high exports at most stations in 2011. Shannonbridge and Arklow are limited by the Athlone-Shannonbridge bottleneck. Since the data for these analyses were frozen at the end of December 2004, the TSO has progressed plans to build a second line from Athlone to Shannonbridge. The opportunity for exports at Arklow and Shannonbridge is likely to increase as a result.

---

#### **10.4 SUITABILITY OF LOCATIONS FOR CONNECTION OF IRELAND-BRITAIN INTERCONNECTOR**

The results show that areas suitable for large demand connections do not coincide with areas suitable for large generation connections. Export capabilities are very high at Dublin and the north-east whereas import capabilities are high at Cullenagh in County Waterford. Thus none of the locations examined would have the capacity to import and export 500 MW. Substantial investment is likely to be required to provide this capacity.

A sensitivity analysis, with the Crane-Wexford 110 kV line uprated, was carried out on the 2011 results. Following this uprating, the opportunity for imports at Louth, Gorman and Arklow improves somewhat. The opportunity for exports improves at Cullenagh. Significant further reinforcement would be required before these stations could accommodate 500 MW of power.