4 GENERATION

This chapter gives information about existing generation capacity and projections for the seven years to 2011. All generation capacity and dispatch figures in this Forecast Statement are expressed in exported or net terms i.e., generation unit output less the unit's own auxiliary load.

At the beginning of 2005, some 5,740 MW (net) of generation capacity was installed in Ireland. Of this 5,320 MW is connected to the national grid and 420 MW is connected directly to the distribution system.

In July 2003, ESB and NIE signed an agreement by which NIE would procure energy and capacity from a power station in Ballylumford, County Antrim and deliver it to ESB over the main interconnector. The maximum amount of power that can be delivered at the interconnector under this contract is 167 MW. As advised by ESB, the termination date of this contract is assumed to be 31st October 2005. For the purposes of the analyses in this Forecast Statement, therefore, it was assumed that the Ballylumford generation was available in the 2005 summer cases only.

4.1 EXISTING AND PLANNED GRID-CONNECTED GENERATION

The 5,320 MW figure includes a number of generators connected in 2004. They are the new peat-fired plant Lough Ree Power (91 MW), connected to Lanesboro station, the two Rhode peaking capacity plants (102 MW) connected at Derryiron station and the Meentycat wind farm (71 MW), connected to the new Drumkeen 110 kV station. The figure also takes account of changes in capacity of some existing generators detailed in Section 4.3.

A number of generators have applied for connection to the grid. At the time of data freeze, 11 legal contracts have been signed, agreeing to connect a total generation capacity of 1,377 MW to the grid:

- Arklow Banks, a 60 MW offshore wind farm off the coast of Wicklow, due in 2007,
- Aughinish, two 75 MW gas turbine generators in Limerick, due at the end of 2005,
- Ballywater, a 31.5 MW wind farm in Wexford, connected in early 2005,
- Booltiagh, a 19.5 MW wind farm in Clare, due in 2005,
- Coomagearlahy, a 42.5 MW wind farm in Kerry, due in 2005,
- Derrybrien, a 60 MW wind farm in Galway, due in 2005,
- Huntstown 2, a 400 MW combined cycle gas turbine (CCGT) in North Dublin, due in 2007,
- Mountain Lodge, a 24.8 MW wind farm in Cavan, due in 2005,

- Ratrussan, a 70 MW wind farm in Cavan, due in 2005,
- Tynagh, a 382 MW combined cycle gas turbine (CCGT) in Galway, due in 2006,
- West Offaly Power, a 137 MW peat-fired generator in Offaly, connected in early 2005.

Connection details for these generators are described in Section 2.4 in Chapter 2.

Table D-1 in Appendix D lists the existing and planned grid-connected generation plant and their capacities.

4.2 ADDITIONAL GENERATION REQUIREMENT FOR 2011 STUDIES

Since *Forecast Statement 2004-201*0, Huntstown 2 has committed to connect to the grid. This extra generation capacity as well as an increase in committed wind generation means that there was adequate generation to dispatch for the 2011 capability analyses. This should not be interpreted as indicating that additional capacity will not be required by 2011. In reality, the available generation capacity, at any time, will be less because of forced and scheduled outages. Please refer to the *Generation Adequacy Report 2005-2011* for an assessment of future capacity requirements.

4.3 GENERATION UNIT CAPACITY CHANGES

In 2004, ESB requested that the Maximum Export Capacities (MEC) for a subset of its portfolio be modified. Table 4-1 shows the original MEC, the requested MEC values and the magnitude of the change for the affected units.

Table 4-1 MEC Reductions

Unit	Original MEC (MW)	Requested MEC (MW)	Reduction (MW)
Poolbeg 1	114.5	109.5	5
Poolbeg 2	114.5	109.5	5
Poolbeg 3	257	242	15
Great Island 1	57	54	3
Great Island 2	57	54	3
Great Island 3	112	108	4
Tarbert 1	57	54	3
Tarbert 2	57	54	3
Total			**41**

The CER is currently considering this request. While formal approval of this request has not been granted, the CER has advised as follows: "Deratings of the above plant are still going through the required approval process as set out by CER. For the purposes of the Forecast Statement only CER has asked ESBNG to assume that the deratings have been approved." Therefore, the requested MEC values were assumed in this Forecast Statement.

In addition to these reductions, three additional changes are included in this report as advised by the relevant generation companies. The maximum continuous rating (MCR) of Moneypoint units are reduced by 6 MW during the study period to reflect the impact of fitting emissions limiting technology. The MCR of the Dublin Bay unit has been increased to 409 MW, following the removal of an operational limit which had been in place since the unit was commissioned. The MCR of the planned Tynagh generator will be 382 MW and not 391 MW as was listed in the connection application and in *Forecast Statement 2004-2010*.

4.4 GENERATION UNIT RETIREMENTS

The closure of generation plant could have a significant impact on the ability of the grid to comply with standards. Under the Grid Code, a minimum of 24 months notice is required by the TSO to address the potential implications of any generation closures.

With the closure of Bellacorick station in early 2005, ESB Power Generation has now retired all its old peat-fired generation units.

ESB has advised termination dates for the peaking units and the NIE contract. The two peaking units at Aghada and Tawnaghmore are assumed to retire at the end of 2006 and the two Rhode peaking units are assumed to retire in 2007. The termination date of the NIE contract is assumed to be 31st October 2005.

In the absence of further notice of plant closures, all other existing generation capacity is assumed to remain in service.

4.5 EMBEDDED GENERATION

There is approximately 420 MW of embedded generation plant i.e., connected to the distribution system or at a directly-connected demand customer's site. This figure comprises Combined Heat and Power (CHP) schemes and small thermal units and renewable generation from wind, small hydro, land-fill gas (LFG) and biomass sources. Table 4-2 lists the existing embedded generation capacity totals by generation type. Table D-2 in Appendix D provides details of the existing wind farms and their capacities.

Table 4-2 Existing Embedded Generation (at the date of data freeze – December 2004)

	CHP	Small Thermal	Wind[6]	Small Hydro[7]	LFG / Biomass	Total
Net Capacity (MW)	145	9	213	29	24	420

As described in Section 3.1 of Chapter 3, embedded generators reduce the demand supplied through the transmission interface stations. Forecasts of demand at the relevant transmission interface stations, presented in Table C-1 of Appendix C, take account of the contribution of the existing non-wind embedded generators[8]. The *Generation Adequacy Report 2005-2011* (GAR) forecasts the total CHP and non-wind renewable capacity to grow by about 15 MW per year.

6 The Wind figure excludes the transmission connected wind farms.
7 The Hydro figure includes the Clady (4MW) and Leixlip (4MW) stations, which are owned and operated by ESB.
8 Because of the variability of wind, a fixed contribution from embedded wind farms is not taken into account in the calculation of the peak transmission flow forecasts. Rather a number of wind scenarios are considered in the Forecast Statement analyses.

4.6 WIND GENERATION

Over the past eight years wind power generation in Ireland has increased from 20 MW (two wind farms) to 323 MW (37 wind farms) as at the end of December 2004. Figure 4-1 shows transmission connected, distribution connected and total wind power connected capacity at year end from 1992 to 2004. The graph illustrates the steep increase in wind power in recent years.

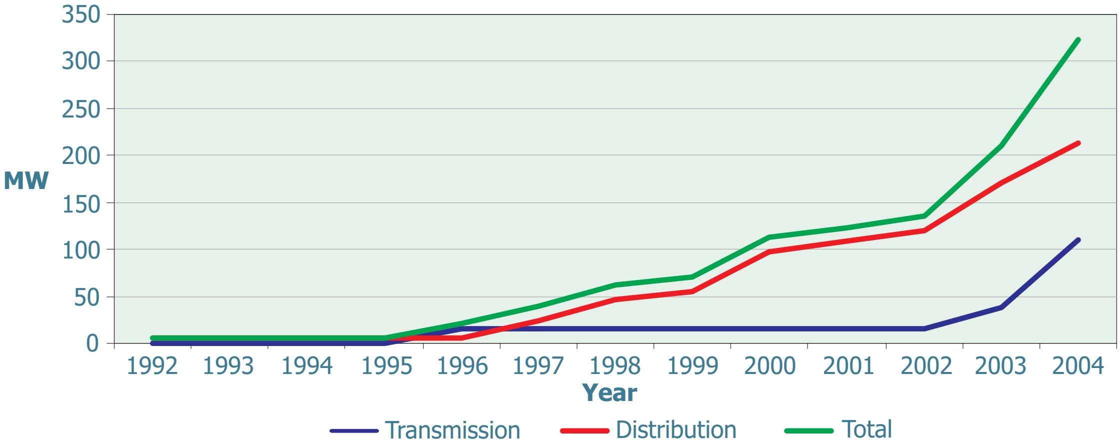

Figure 4-1 Growth in Wind Capacity, 1992 to 2004

As at the end of December 2004, 39 wind farms totalling 574 MW have signed connection offers and are committed to connecting to the transmission or distribution networks over the next 2 years. Table 4-3 shows the total amount of existing and committed wind generation capacity expected to be connected at the end of 2005, 2008 and 2011. The individual wind-farm details are included in Appendix D.

Table 4-3 Existing and Committed Wind Capacity Totals at Year End (MW)

Connected to	2004	2005	2008	2011
Transmission	110	358	418	418
Distribution	213	416	479	479
Total	**323**	**774**	**897**	**897**

Between the December 2004 data freeze date and the end of May 2005, five contracts were signed for the connection of an additional 58 MW of wind generation.

In addition to the committed connections, 155 applications totalling more than 2,339 MW have been received by the TSO and DSO. The TSO is continuing to work with the wind industry to assess and overcome the implications of large amounts of wind generation for the safe and reliable operation of the power system.

The RES-E Directive of the European Parliament and Council (Directive 2001/77/EC) sets a target for Ireland of 13.2% of total electricity consumption from renewable sources by 2010. Wind power generation is expected to be the major contributor to this target. This 13.2% target can be achieved with approximately 1,000 MW of wind power generation installed by 2010. Current interest as indicated above suggests that the target is likely to be surpassed.