

Monitoring the 'Connect and Manage' electricity grid access regime

Fourth report from Ofgem, 5 December 2013

In 2010 we were asked to monitor and report on the impact of the enduring 'Connect and Manage' grid access regime. This is our fourth report, which covers the period 1 September 2012 to 30 September 2013¹.

The Connect and Manage transmission access regime was introduced by the Government in August 2010 and fully implemented on 11 February 2011. The aim was to improve access for generators to the electricity transmission network. More background information on the Connect and Manage regime is set out in Appendix 2.

In carrying out our monitoring role of the Connect and Manage regime, the Department of Energy and Climate Change (DECC) has asked that we provide a published report on the following:

1. the impact on connections by generation type and region
2. developers' confidence in the new arrangements
3. costs and benefits to consumers of the new arrangements
4. progress and costs of delivering the necessary wider grid investments.

We set out in the following pages a summary of the available evidence in each of the areas for the reporting period. We also include information provided by the onshore transmission licensees on the differentials between connection dates requested by customers and connection dates offered, as well as factors influencing the offer dates.

Key points

- In total, 163 large generation projects² have signed Connect and Manage offers, representing a capacity of nearly 37,000MW.
- Connection dates for these projects have been brought forward by an average of five years compared to the previous 'Invest and Connect' approach³.
- 91 projects⁴, with a total capacity of 1,199MW, have connected to date under the Connect and Manage arrangements (of which 743MW relates to 15 large projects).

¹ In respect of Timely Connections, the report covers 1 October 2012 to 30 September 2013. This is due to a historical disparity between 'Connect and Manage' and 'Timely Connections' reporting periods. Going forward, the two reporting periods have been aligned.

² Transmission connected and large embedded generation projects only

³ Under 'Invest and Connect', generators seeking to connect to the network had to wait for the completion of all wider transmission system works identified as required for their connection, in accordance with the minimum criteria set out in the National Electricity Transmission System Security and Quality of Supply Standard (NETS SQSS).

⁴ Transmission connected, large embedded and small embedded generation projects

- So far, around 930,000 tonnes of carbon dioxide have been saved through renewable generation connecting early as a result of Connect and Manage.
- To date, constraint costs attributable to the Connect and Manage regime total £26.6m. Looking ahead, National Grid (NGET) has estimated total constraint costs for the period from 2013/14 to 2020/21 to lie between £81m and £245m, compared to the previous forecast of £680m.
- We have been managing programmes which provide funding to the transmission owners for large-scale transmission network reinforcement works. These projects aim to relieve network constraints in the long term, as well as connect new generation and ensure the continued reliability of the system. We are assessing the funding applications for major reinforcements to the transmission system under the Strategic Wider Works (SWW) arrangements and its predecessors. Once commissioned, these works will have a significant impact on reducing constraint costs attributable to Connect and Manage and on constraint costs more generally.

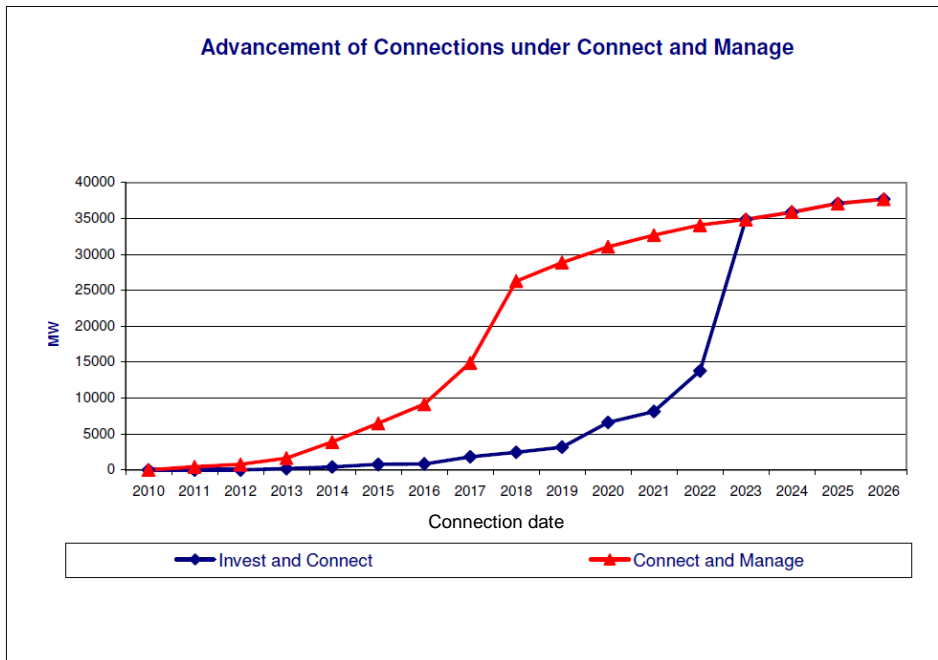
1. Grid connection activities

Impact on connections by generation type and region

- 1.1. This section sets out the number of connection agreements entered into, and the amount of generation connected to the transmission system under the enduring Connect and Manage arrangements. The data is based on information provided to us by NGET and published in its latest quarterly report⁵ on the Connect and Manage regime.
- 1.2. As at 30 September 2013, a total of 163 signed Connect and Manage agreements have been entered into by transmission connected and large embedded generators for connection to the transmission system. These agreements total a capacity of 36,982 MW. This is an increase of 38 projects, and 6,876 MW, from August 2012.
- 1.3. Similarly, there has been an increase in the number of small embedded generation plants with signed Connect and Manage agreements. These have risen to 134 with a total of 655 MW. This is an increase of 30 signed agreements and 164 MW from August 2012.
- 1.4. The number of generators with a signed Connect and Manage agreement that are connected to the system has also increased. During the period from 1 September 2012 to 30 September 2013, 42 generators were connected, with a combined capacity of 497MW, resulting in a total of 91 connected generators with a total capacity of 1,199MW.
- 1.5. Connection dates for all generators continue to be advanced under Connect and Manage⁶. The average advancement across all transmission connected and large embedded generators is five years, compared to six years in our previous report. For small embedded generation, the average advancement period is nine years, down from ten years in the previous year.
- 1.6. The graph overleaf illustrates the anticipated difference in the rate of increase of capacity between the previous 'Invest and Connect' approach and the current Connect and Manage regime.

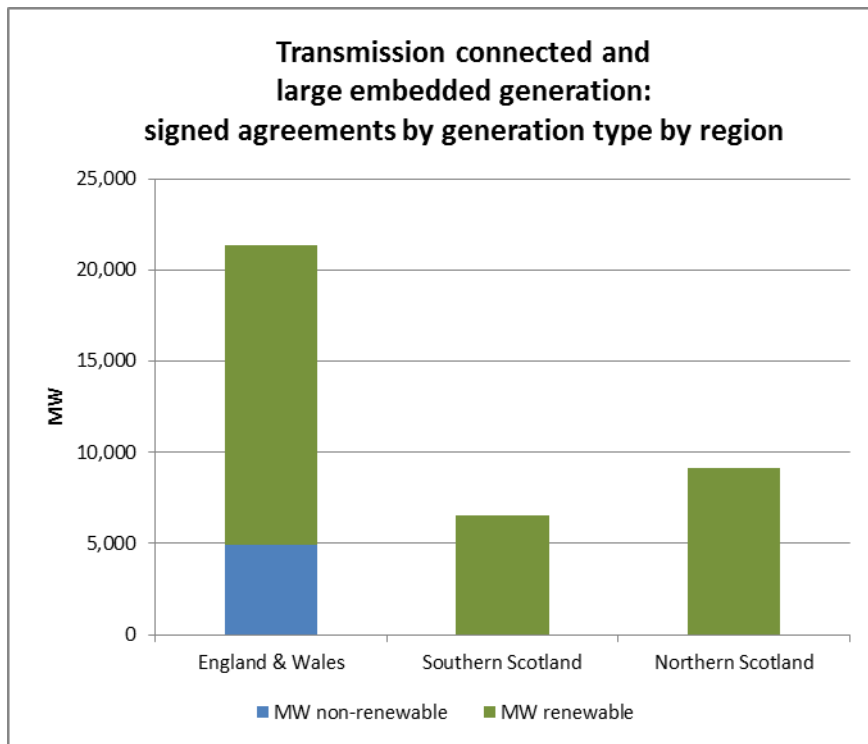
⁵ <http://www2.nationalgrid.com/UK/Services/Electricity-connections/Industry-products/connect-and-manage/>

⁶ in comparison with the connection date which would be provided under an 'Invest and Connect' offer.



Source: NGET's Quarterly Report on the Connect and Manage Regime, Nov 2013⁵

1.7. Around 87% of the capacity that has benefitted from Connect and Manage agreements is renewable generation. In England and Wales, just under 5,000 MW of non-renewable generation is also benefitting from earlier connection dates.



More detailed connections data is available in Appendix 1.

Timely connections

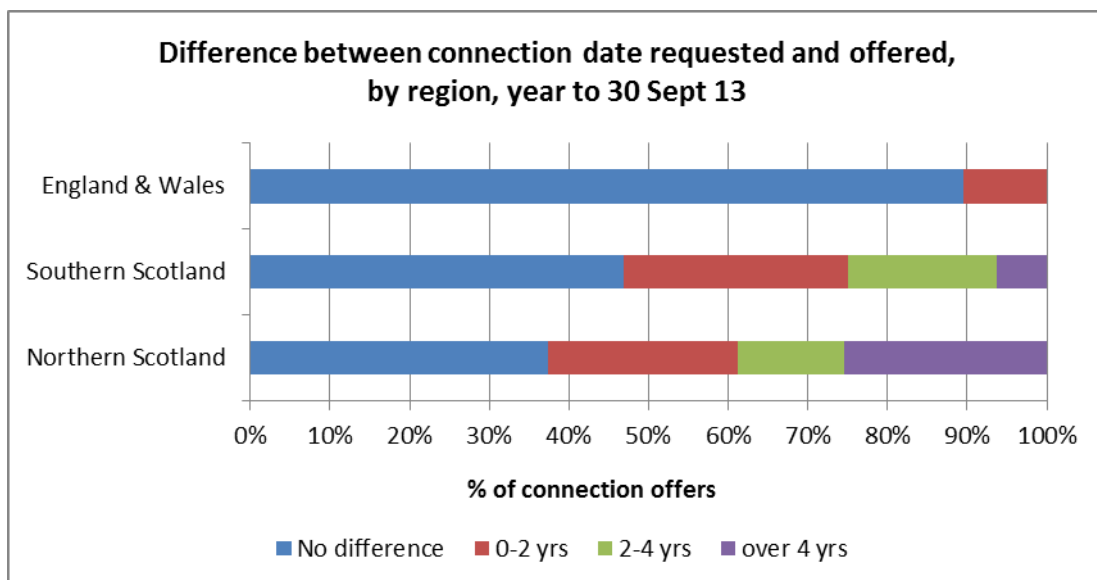
1.8. We have been receiving half-yearly Timely Connections reports from onshore transmission licensees. These reports provide us with information on the factors affecting the connection dates offered to generators. This enables us to assess whether any changes are needed to the existing framework. A non-confidential version of the report has been published on NGET's website⁷.

1.9. The reports show that NGET, as System Operator (SO), has issued in total 156 connection offers between 1 October 2012⁸ and 30 September 2013:

- 57 of these were in England and Wales;
- 32 were in Southern Scotland;
- 67 were in Northern Scotland.

58.3% of these offers met the customers' requested dates.

1.10. The graph below illustrates, for each of the transmission owners' regions, the proportion of offers that met customers' requested completion dates, and the extent of the difference where the request was not met. In England and Wales, nearly 90% of offer dates meet customers' requested dates. In Northern Scotland, around 63% of offers were made for a date later than requested by the customer, demonstrating the network constraints in that part of Great Britain.



1.11. Differences between connection offer dates and customers' requested dates are due to the fact that some connections are contingent on the completion of other projects including substation works, the obtaining of planning consents, collaboration with distribution network operators and the timing of outages.

Developers' confidence in the new arrangements

1.12. 2013-14 is the first year to which RIIO-T1⁹ applies. Among other changes, RIIO-T1 is an outputs-led framework. This means we assessed the funding requirements

⁷ <http://www2.nationalgrid.com/UK/Services/Electricity-connections/Industry-products/timely-connections-report/>

⁸ Note that information on Timely Connections to 30 September 2012 was reported on in our last annual report. Since then, the reporting periods for the Connect and Manage reports and the Timely Connections reports have been aligned.

⁹ RIIO-T1 is the first transmission price control to reflect the new RIIO (Revenues = Incentives + Innovation + Outputs) model.

against what consumers and stakeholders wanted the transmission companies to deliver. We will hold the companies accountable for delivering outputs for timely delivery of connections, customer satisfaction and stakeholder engagement, which are all relevant to how the companies are performing in their work on connections to the networks.

- 1.13. Next year's report will be able to consider data on the first year's transmission owner (TO) output performance along with relevant cost performance. We are working this year to build a monitoring framework for RIIO-T1 that will inform stakeholders on performance.

2. Costs and benefits to consumers of the new arrangements

Constraint costs to date

- 2.1 Last year, we reported that NGET had identified constraint costs¹⁰ due to Connect and Manage of £4.4m¹¹. These were attributable to the six large projects that had benefited from earlier connection dates and were active at this time. To put this in context, total constraint costs incurred by NGET for the same period were £379.3m, 1.2% of which were Connect and Manage related costs.
- 2.2 In the period covered by this report, a further nine large projects connected to the transmission system, bringing the total to 15 connected sites. During this time, the related constraint costs amounted to £22.2m, representing 8.1% of the total constraint costs of £273.1m. This increased share is expected and is a consequence of the rising share of connections based on Connect and Manage offers (versus offers based on the previous regime).

Future constraint costs

- 2.3 NGET has also provided estimates for the anticipated future costs of earlier connection under Connect and Manage¹². Last year, these were modelled using a single "More Likely" future energy scenario. Since then, NGET has revised its modelling approach to align with its future energy scenarios, and to take account of the impact of the completion of wider reinforcement works. NGET has decided to use both its "Gone Green" (GG) and its "Slow Progression" (SP) scenarios for these projections to reflect the potential changes in the economic and political landscape.
- 2.4 NGET's updating of the modelling scenarios, together with other revisions of their modelling assumptions, has resulted in a significant overall decrease in its constraint cost projections. NGET's latest total estimates for the period from 2013/14 to 2020/21 lie between £81m (under the SP scenario) and £245m (under the GG scenario), compared to the previous forecast of £680m¹³.

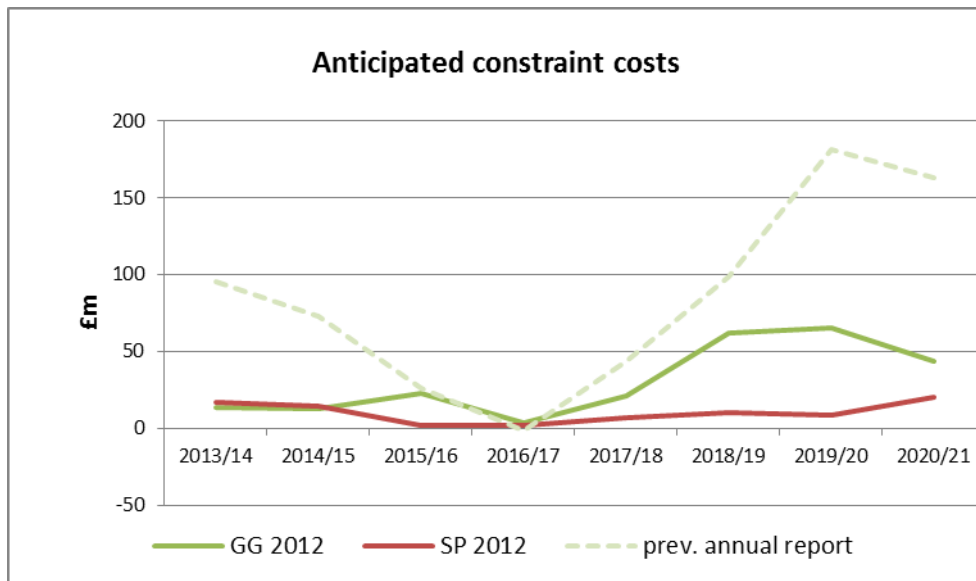
¹⁰ A constraint arises where the system is unable to transmit the power supplied to the location of demand due to congestion at one or more parts of the transmission network. In the event that the system is unable to flow electricity in the way required, NGET will take actions in the market to increase and decrease the amount of electricity at different locations on the network. These actions incur a cost.

¹¹ between 1 April 2011 and 31 August 2012.

¹² NGET has highlighted that these figures should not be viewed as definitive forecasts and are affected by a wide range of factors such as the progress of network reinforcements and changes in market conditions.

¹³ For details, see NGET's Quarterly Connect and Manage Reports at <http://www2.nationalgrid.com/UK/Services/Electricity-connections/Industry-products/connect-and-manage/>

- 2.5 Under NGET's GG scenario, the model has estimated constraint costs of £12.5m in 2014/15, peaking in 2019/20 at £65.2m, and falling to £43.6m in 2020/21. Under the SP scenario, annual expected constraint costs never rise above £20.0m. As the graph below shows, in contrast, last year's projections peaked at £181.2m in 2019/20.



- 2.6 As reported last year, NGET still expects constraint costs to reach a low point in 2016/17. This is primarily due to the anticipated completion of major reinforcements such as the Beauldy Denny line and the Hunterston-Deeside link, which have been progressed through the funding arrangements we have introduced to facilitate critical investment (see also section 3). From 2017/18, constraint costs are anticipated to start rising again under the GG scenario as a result of a significant increase in new generation which may lead to additional system constraints.

Controlling constraint costs

- 2.7 We have put in place a range of measures designed to ensure that constraint costs are minimised.
- 2.8 We have placed strong incentives on NGET as SO to control the costs incurred in managing constraints on the system. Our balancing services incentives scheme sets a target for these costs. NGET has the opportunity to share any under or over-spends against this target, providing it with an incentive to keep constraint costs as low as possible. In addition, NGET's licence conditions require it to act economically and efficiently. We have regular procedures in place to monitor the actions of the SO and have the powers to take action if we consider NGET to be in breach of its licence, for example by not acting economically and efficiently in its management of constraints.
- 2.9 With support from Ofgem, DECC introduced the Transmission Constraint Licence Condition (TCLC) in October 2012. The TCLC will stay in effect until 15 July 2017, with the possibility of a two-year extension. Its purpose is to prevent generators from obtaining an excessive benefit at the expense of consumers during periods of electricity transmission constraint, for example by making dispatch decisions that create or exacerbate constraints, or by obtaining an excessive benefit from bids they make to reduce their output. In the first year that the TCLC has been in place, we have already seen a positive impact. For example, the average amount paid, per

MWh, to onshore wind farms to reduce generation in the first nine months of the TCLC has almost halved compared to the year before the TCLC came into force. We will continue to monitor electricity generators' compliance with the TCLC.

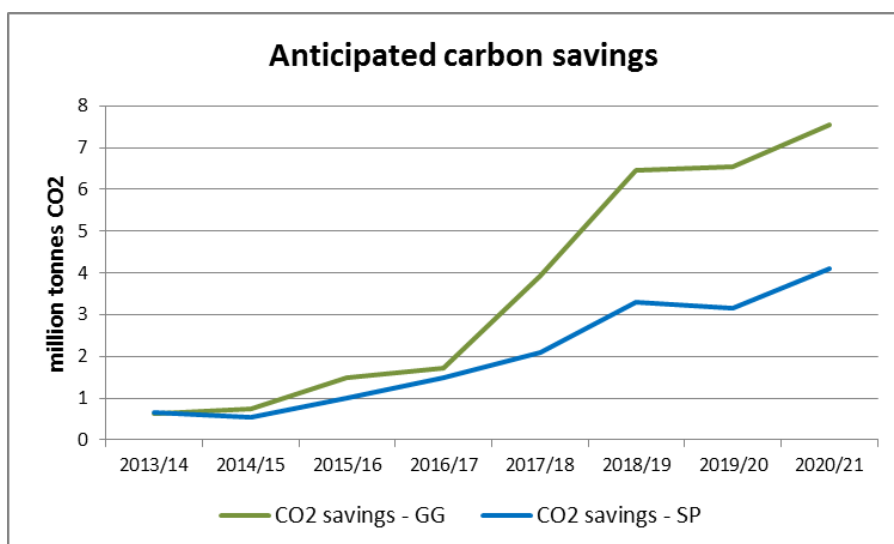
- 2.10 Effective communication between the SO and the TOs is critical to the efficient delivery of connections and the minimisation of constraint costs. The SO-TO code (STC) defines the high-level relationship between the parties. During RIIO-T1, we worked with the TOs and NGET, as the SO, to challenge further their commitments on communication, information sharing and decision making that could make this interaction more effective in minimising whole industry costs. This might, for example, be through altering TO work plans at relatively small cost but in a way that allows a significant reduction in constraint costs.
- 2.11 The more detailed principles for coordination and communication between the SO and the TOs are laid out in the Network Access Policy (NAP). This is a live document which can be amended as lessons are learnt. It is likely that the NAP will be updated in line with new SO incentive arrangements from 1 April 2015. This should facilitate increasingly sophisticated joint decision making.

Carbon savings to date

- 2.12 In its quarterly reports⁵, NGET has published information on the carbon savings resulting from the Connect and Manage regime. These savings arise when renewable generation that has connected under Connect and Manage offsets generation from other sources.
- 2.13 In last year's report, total carbon savings attributable to the Connect and Manage regime were 214,745 tonnes of carbon dioxide (CO₂). As at 30 September 2013, carbon savings have more than quadrupled to a total of 928,186 tonnes since the start of the regime.
- 2.14 NGET has set out that it does not have access to real time metering information for certain types of embedded generation and, for this reason, it remains unable to allocate any related constraint costs or related carbon savings to these generators.

Future carbon savings

- 2.15 In its most recent quarterly report, NGET added projections for carbon savings attributable to the Connect and Manage regime up to 2020/21. The graph overleaf shows the anticipated trajectory under both scenarios.



- 2.16 Under the GG scenario, the anticipated carbon savings in 2020/21 of 7.56m tonnes of CO₂ are approximately equivalent to emissions from three medium-sized coal-fired power stations. Total carbon savings over the eight-year period are projected to be between 16 and 29 million tonnes under the SP and GG scenarios respectively.

3. Progress and costs of delivering the necessary wider grid investments

- 3.1 In order to relieve network constraints in the long term, as well as connect new generation and ensure the continued reliability of the system, we have been managing programmes which provide funding to the TOs for large-scale transmission network reinforcement works.
- 3.2 The largest project under the Transmission Investment for Renewable Generation (TIRG) mechanism is the Beaulieu Denny scheme, jointly delivered by SP Transmission (SPT) and Scottish Hydro Electric Transmission (SHE-T). We have approved funding to significantly increase 220km of line capacity to transmit electricity from Scottish generators (mostly renewables) to consumers in the South. The first 50km of the line became operational this summer, with the remainder expected to be commissioned in 2015/16.
- 3.3 In parallel with the current transmission price control regime, we also manage the Strategic Wider Works (SWW) programme. In business plans developed for the price control review, the three TOs (NGET, SPT and SHE-T) identified several transmission projects totalling approximately £8 billion (2009/10 prices) that may be needed over the next decade.
- 3.4 As at the end of November, we have received SWW proposals for three new transmission projects in northern Scotland from SHE-T with a combined total value of around £1.5 billion for assessment under the SWW arrangements. We have concluded our assessment of the first of these projects, Kintyre-Hunterston. The project is designed to deliver 270MW of additional transmission capacity from late 2015/16, reducing existing constraints and enabling new connections in the Kintyre area. Subject to the relevant licence modifications, our decision will increase SHE Transmission's Allowed Expenditure by £197.4million.

- 3.5 We expect several new proposals to come forward over the next year for additional major transmission upgrades in Scotland as well as in England. We are engaging regularly with all three TOs on the upcoming projects as well as the SWW arrangements to help ensure a streamlined and efficient assessment process and timely decision-making on the proposals that are made to us. To provide more transparency to the TOs and wider stakeholders on the SWW arrangements, we have published detailed guidance on the issues we consider in our assessment of new transmission project proposals, the information that the TOs need to provide and how our assessment will be informed by consultation with stakeholders.
- 3.6 In December 2012, SHE-T, the TO in Northern Scotland, announced delays to several potential transmission upgrades and projects. The delays are typically between two and four years. NGET estimated that the impact of the delays on developers was moderately low, as the majority of developers have stated that the revised programme is in line with their actual connection intentions.
- 3.7 Recent developments are helping to maximise any available capacity and make it available to developers. For example, the new underwriting provisions for grid connections introduced in 2013 have resulted in more accurate connection date requests. In addition, NGET allowed a one-off window for developers to adjust connection dates and reduce their transmission capacity when the new underwriting provisions came into effect.

Appendices

1. Connections data
2. Background to Connect and Manage
3. Associated documents

Appendix 1 – Connections data

Table 1: Connection information for large projects (offers, agreements and connected generation)

Region			As at August 2012	As at September 2013	Difference ¹⁴
England & Wales	Total number of offers, agreements and connections		24	37	+13
	MW		15,721	21,337	+5,616
	Average reduction in connection date ¹⁵		5 years	3 years	-2 years
		Number of projects connected	0	0	-
		MW connected	0	0	-
Scotland	Total Number		101	126	+25
	MW		14,385	15,645	+1,260
	Average reduction in connection date		6.5 years	5.8 years	-0.7 years
		Number of projects connected	6	15	+9
		MW connected	432	743	+311
Totals	Total number of offers, agreements and connections		125	163	+38
	MW		30,106	36,982	+6,876
	Average reduction in connection date		6 years	5 years	-1 year

¹⁴ Difference between 'as at September 2013' and 'as at August 2012'.

¹⁵ This is the average difference between the estimated date for connection in an offer made under 'Invest and Connect' (see footnote 2) and Connect and Manage.

Table 2: Small/embedded generation connections data

Region			As at August 2012	As at September 2013	Difference ¹⁴
England & Wales	Total Number of offers, agreements and connections		1	1	-
	MW		81	81	-
	Average reduction in connection date ¹⁶		3 years	3 years	-
		Number of projects connected	1	1	-
		MW connected	81	81	-
	Scotland	Total Number		103	133
MW			409	574	+165
Average reduction in connection date			10.5 years	9.6 years	-0.9 years
		Number of projects connected	42	75	+33
		MW connected	108	294	+186
Totals		Total Number of offers, agreements and connections		104	134
	MW		491	655	+164
	Average reduction in connection date		10 years	9 years	-1 year

¹⁶ This is the average difference between the estimated date for connection in an offer made under 'Invest and Connect' and Connect and Manage.

Appendix 2 – Background to Connect and Manage

Following consultation on models for improving grid access¹⁷, in August 2010 the Government introduced Connect and Manage. Under this access regime, all new generation is able to apply for a connection date, based on the time taken to complete a project's enabling works, ie ahead of the completion of wider reinforcements. Any resultant constraint costs are socialised across all users, along with constraint costs more widely. The cost of wider works required on the network is also spread across all consumers.

Connect and Manage followed the 'Interim Connect and Manage' (ICM) arrangements, which Ofgem introduced in 2009. Ofgem introduced ICM on a temporary basis, with the aim of accelerating the connection of new generation by extending the principle of 'over selling'. We noted that, in the transition to the British Electricity Trading and Transmission Arrangements (BETTA) in 2005, certain generators that had connected or applied to connect to a transmission or distribution system in Great Britain by 1 January 2005 had benefitted from the policy of over selling transmission capacity¹⁸. To avoid undue discrimination in the terms for accessing and connecting to the transmission system, we considered it appropriate to extend this principle for an interim period until, and subject to, the timely and successful implementation of enduring access arrangements¹⁹.

We recognised that the Connect and Manage approach could give rise to significant increases in the volume and costs of constraints. However, we expected that the impact on costs would be small in the short term, and considered this interim approach appropriate until enduring arrangements were developed that would address our concerns about high constraint costs. We set out that we would revisit this approach if, for example, there were delays to introducing a new access regime or if costs were to rise. We noted that this could require remedies which would affect all generators in areas of over selling. The Connect and Manage regime introduced by Government in August 2010 replaced ICM, and was fully implemented on 11 February 2011.

¹⁷https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/42979/251-govt-response-grid-access.pdf

¹⁸ In the transition to BETTA, Ofgem granted a derogation to NGET and SPT from the requirement to comply with the Security and Quality of Supply Standard (SQSS) planning criteria over the circuits which form the transmission boundary between Scotland and England ('the Cheviot boundary'). The effect of this derogation was that additional generation connected to the system, ahead of the reinforcement of that boundary, needed to achieve compliance of the SQSS.

¹⁹ Ofgem's decision letter on ICM can be viewed at the following link:

<http://www.ofgem.gov.uk/Networks/Trans/ElecTransPolicy/tar/Documents1/20090508%20derogations%20interim.pdf>

Appendix 3 - associated documents

- Department of Energy & Climate change – Government Response to the technical consultation on the model for improving grid access – 27 July 2010
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/42979/251-govt-response-grid-access.pdf
- Previous reports to the Secretary of State, Monitoring the 'Connect and Manage' electricity grid access regime
<https://www.ofgem.gov.uk/electricity/transmission-networks/transmission-access-review>
- National Grid's Quarterly Connect and Manage reports
<http://www2.nationalgrid.com/UK/Services/Electricity-connections/Industry-products/connect-and-manage/>
- National Grid's Timely Connections reports
<http://www2.nationalgrid.com/UK/Services/Electricity-connections/Industry-products/timely-connections-report/>