

Monitoring the 'Connect and Manage' electricity grid access regime

Fifth report from Ofgem, 16 December 2014

In 2010 we were asked to monitor and report on the impact of the enduring Connect and Manage grid access regime. This is our fifth report, which covers the period from 1 October 2013 to 31 September 2014 (2013/14).

Highlights

- Since February 2011, a total of 201 large generation projects¹ have signed Connect and Manage offers, representing a capacity of over 37,000MW.
- Connection dates for these projects have been brought forward by an average of five years compared to the previous 'Invest and Connect' approach².
- 23 large projects, with a total capacity of 1,408MW, have connected under Connect and Manage.
- So far, around 2,742,000 tonnes of carbon dioxide have been saved through renewable generation connecting early as a result of Connect and Manage.
- There has been an increase in constraint costs that can be attributed to the Connect and Manage regime. The costs have increased from £22.2m in 2012/13 to £69.4m in 2013/14. National Grid (NGET) estimates that total constraint costs attributable to the regime in the period from 2014/15 to 2020/21 will be between £288m and £403m, depending on the scenario.
- We continue to approve funding to the onshore transmission owners for large-scale transmission network reinforcement works. In addition to the projects approved in previous periods, during the period of this report we approved the Caithness Moray link which will allow 1,200 MW of additional renewable generation to connect in the north-east of Scotland by 2018.

Background

The Connect and Manage transmission access regime was introduced by government in August 2010 and implemented on 11 February 2011. Its aim was to improve access to the electricity transmission network for generators.

We monitor the Connect and Manage regime, and the Department of Energy and Climate Change (DECC) has asked us to publish a report on:

¹ All the data in our report covers transmission connected and large embedded generation projects only.

² 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).

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.

Over the next few pages, we summarise the evidence in each of these areas for the reporting period. We also include information from the onshore transmission licensees on the differences between connection dates requested by customers and connection dates offered.

1. Grid connection

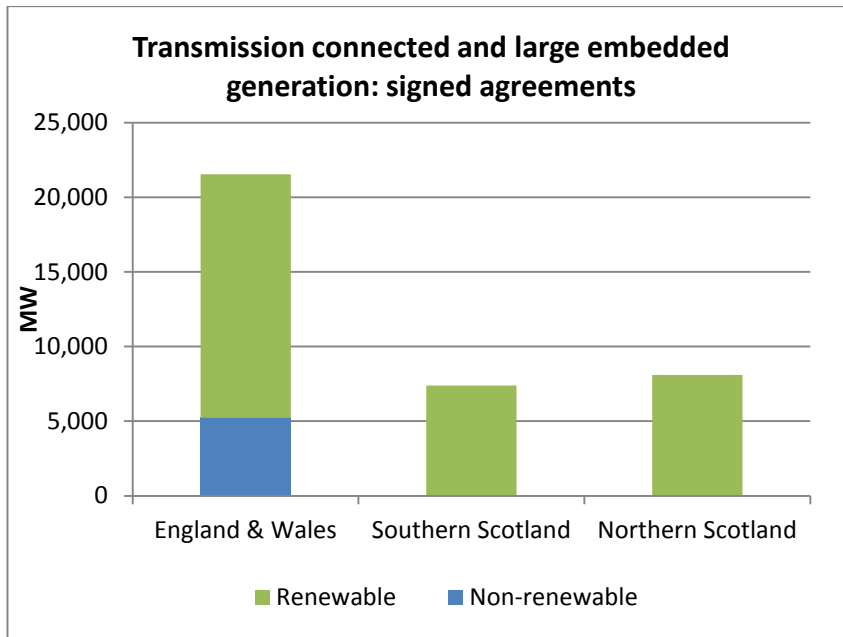
Impact on connections by generation type and region

- 1.1. This section shows the number of connection agreements entered into, and the amount of generation connected to the transmission system under Connect and Manage. The data is based on information from NGET, and published in its quarterly report³ on the Connect and Manage regime.
- 1.2. As at 31 September 2014, a total of 201 signed Connect and Manage agreements had been entered into by transmission connected and large embedded generators. These are for connecting to the transmission system. These agreements total 37,050MW of capacity. This is a net⁴ increase of 38 projects, and 68 MW, from September 2013.
- 1.3. The number of generators with a signed Connect and Manage agreement that are connected to the system has also increased. There are a total of 23 large connected generators with a combined capacity of 1,408MW. This is an increase of eight projects, 664MW, from September 2013.
- 1.4. Connection dates for all generators continue to be advanced under Connect and Manage⁵. The average advancement is still five years; this has remained stable since our previous report.
- 1.5. The graph below shows that around 85% of the capacity that has benefitted from Connect and Manage agreements is renewable generation. Just over 5,000 MW of non-renewable generation, in England and Wales, is also benefitting from earlier connection dates.
- 1.6. Appendix 1 contains more detailed data on connections. It compares connections up to September 2014 and connections the year before, up to September 2013. The comparison is between the numbers and sizes of signed agreements and actual connections.

³ <http://www2.nationalgrid.com/UK/Services/Electricity-connections/Industry-products/connect-and-manage/>

⁴ The net increase is the combination of some projects terminating / reducing capacity and some new connection agreements

⁵ In comparison with the connection date which would be provided under an 'Invest and Connect' offer. While small embedded generators benefit from Connect & Manage, only transmission connected and large embedded generators receive Connect & Manage offers.



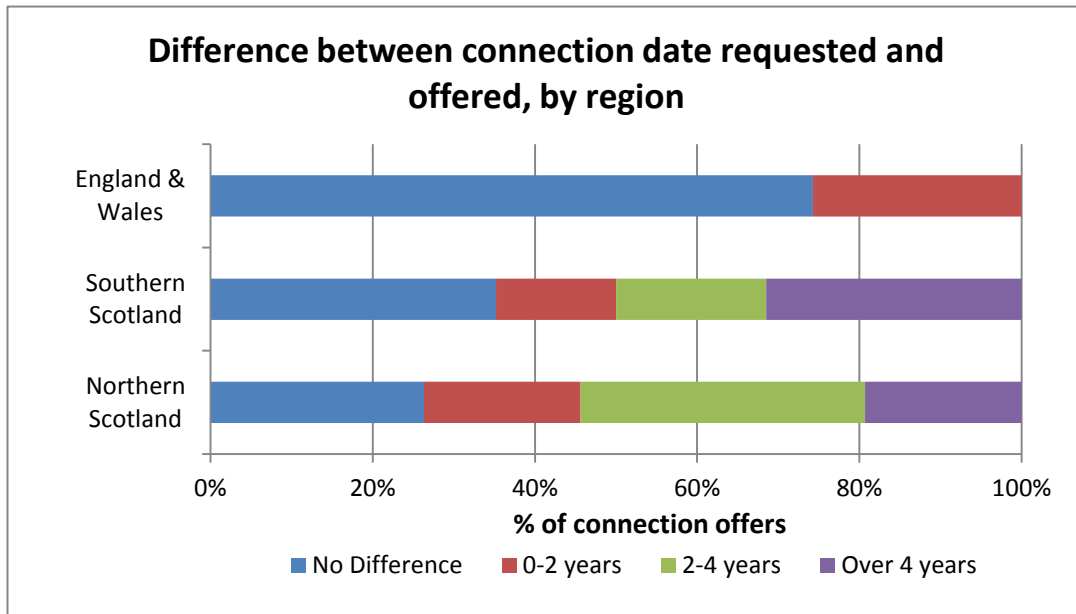
Timely connections

- 1.7. Every six months, we receive “Timely Connections” reports from onshore transmission licensees. These reports show us what factors are affecting the connection dates offered to generators. There is a non-confidential version of the combined reports on NGET’s website⁶.
- 1.8. The reports show that NGET, as System Operator (SO), issued a total of 146 connection offers (including offers to Distribution Network Operators on behalf of embedded generators and offers to modify existing applications) between 1 October 2013 and 31 September 2014. Of these:
- 35 were in England and Wales
 - 54 were in Southern Scotland
 - 57 were in Northern Scotland

41% of these offers met the customers’ requested dates.

- 1.9. The graph below illustrates for 2013/14, for each of the transmission owners’ regions, the offers that met customers’ requested completion dates, and the difference when the request was not met. In England and Wales, 26% of offer dates were made for a date later than requested by the customer. In Northern Scotland, around 74% of offers were made for a date later than requested by the customer, reflecting the network constraints in that part of Great Britain.

⁶ <http://www2.nationalgrid.com/UK/Services/Electricity-connections/Industry-products/timely-connections-report/>



1.10. These differences reflect the fact that some connections depend on other works being completed. These could include substation works, getting planning consents, collaborating with distribution network operators, and the timing of outages.

Developers’ confidence in the new arrangements

1.11. Under the RIIO-T1⁷ arrangements we hold the companies accountable for delivering a range of outputs including timely connections, achieving customer satisfaction targets, and engaging with stakeholders. The network companies submitted first year data to us at the end of July 2014. They also published summary information on their websites at the end of September. We have established a new part of our website and this will be where we publish a full assessment of their performance in early 2015⁸. At this stage, the data shows the companies performing well in these areas against our targets although transmission companies still have lots of room for improvement against other network companies in the way they engage with their stakeholders.

1.12. We are aware that due to the demand for connections in areas of scarce grid capacity such as Northern and South West Scotland, developers’ may not be able to secure a connection date as early as they would like. National Grid has been working with developers to find opportunities where possible to advance connection dates within the existing Connect and Manage framework. We will continue to work with National Grid and DECC to monitor the impact of delays in the ability to connect future generators to the network.

⁷ RIIO-T1 is the first transmission price control to reflect the new RIIO (Revenues = Incentives + Innovation + Outputs) model.

⁸ <https://www.ofgem.gov.uk/network-regulation-%E2%80%93-riio-model/network-performance-under-riio/riio-t1-performance-data>

3. Costs and benefits to consumers

Constraint costs to date

- 2.1 Last year, we reported that NGET had identified constraint costs⁹ from Connect and Manage of £22.2m¹⁰ in 2012/13. This was 8.1% of total constraint costs in that period.
- 2.2 In the period covered by this report (2013/14), 8 more projects have connected to the transmission system, bringing the total to 23 connected sites. The constraint costs related to these sites during this period were £69.4m, representing 30% of the total constraint costs of £227.8m. This is consistent with an increasing proportion of generators in constrained areas having connected under the Connect and Manage regime.

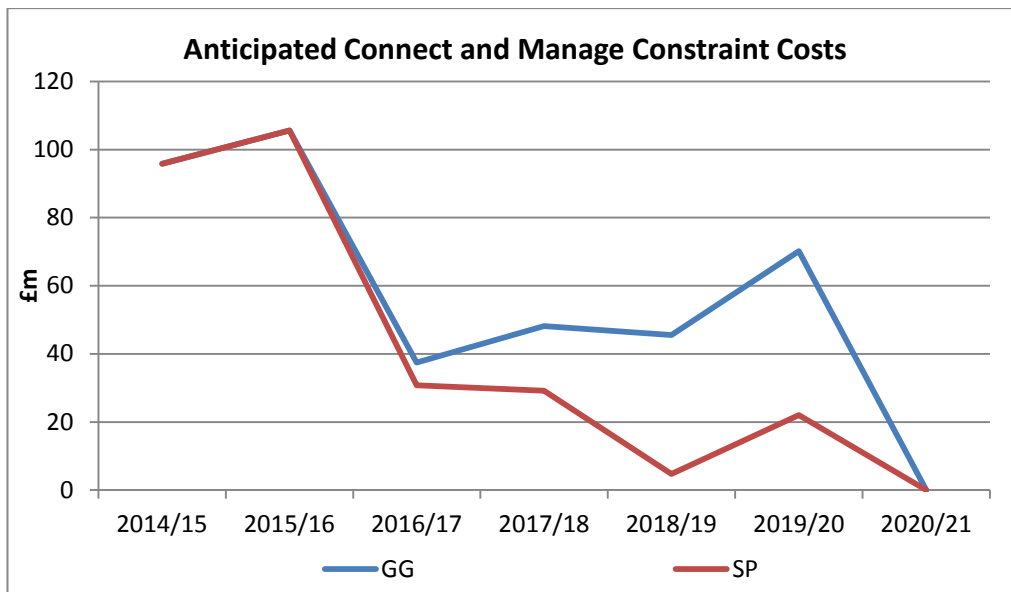
Future constraint costs

- 2.3 NGET also estimates the future anticipated costs of achieving earlier connections under the Connect and Manage regime. NGET has highlighted that these figures should not be viewed as definitive forecasts.¹¹ NGET has refined its modelling approach since the last report to more accurately forecast constraint costs arising from Connect and Manage. NGET still uses two scenarios for its modelling, Gone Green (GG) and Slow Progression (SP). These are consistent with two of the four Future Energy Scenarios published by NGET. Further detail on the modelling approach taken for this report can be found in National Grid's quarterly Connect and Manage report.
- 2.4 There has been an increase in its constraint cost projections for the financial year period 2014/15 – 2020/21, from between £64m and £213m reported in last years report to between £288m and £403m. The increase in this latest forecast is due to a larger than expected increase in the underlying numbers of connected projects as well as the updated modelling scenarios and revised modelling assumptions. Changes include using the 2013 Future Energy Scenarios and associated boundary limits. Differences from the year before include a lower demand forecast, updated wind bid and offer prices and updated heat rates. The latest forecasts compare more closely to those reported in 2012 where constraint costs were forecast to be £584m in the most likely scenario.
- 2.5 The graph below shows the forecast annual Connect and Manage constraints under both scenarios.

⁹ 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.

¹⁰ From 1 September 2012 to 30 September 2013.

¹¹ NGET has highlighted that these figures are affected by a wide range of factors such as the progress of network reinforcements and changes in market conditions. The forecast data is all in financial years eg April – March.



- 2.6 NGET predicts¹² the *total* constraint costs to increase to £251 m for 2014/15 and £241m for 2015/16¹³. The majority of the forecast increase in total constraint costs is because of an increase in constraint costs that can be attributed to Connect and Manage for 2014/15 and 2015/16, as can be seen above. Constraints due to Connect and Manage in these years are therefore 38% and 44% of the total.
- 2.7 NGET expects constraint costs to reduce in 2016/17. This is mainly because major reinforcements such as the Beaulieu Denny line and the new HVDC link¹⁴ connecting Scotland and Northern England are projected to be completed. These have been progressed through the funding arrangements we introduced for critical investment (see section 3). Under the GG scenario, constraints are anticipated to start rising again from 2017/18 as new generators connect leading to further system constraints in advance of further reinforcements.
- 2.8 NGET has forecast that constraint costs attributed to Connect and Manage will be zero in England and Wales from 2019/20 and in Scotland from 2020/21. This is because in its view, the required major transmission reinforcement projects will be completed by this date. The future capacity of the network can then be managed through identifying and planning for the action required on an ongoing basis through the Network Development Policy framework.
- 2.9 In our view, the likely outturn costs will depend on a number of uncertain factors including the timing of future works and the level of new generation connection. It is not therefore certain that the level of constraints that can be attributed to Connect and Manage will be reduced to zero from these dates. The same factors will also influence the total level of constraint costs over this period.

¹² National Grid October 2014 Monthly Balancing Services Summary <http://www2.nationalgrid.com/UK/Industry-information/Electricity-transmission-operational-data/Report-explorer/Services-Reports/>

¹³ As compared to the October 2013 previous report which had £180m for 2014/15

¹⁴ National Grid and SPT have advised that they have encountered manufacturing difficulties in the production of the HVDC cables for the Western HVDC link, and as consequence the project is unlikely to be delivered until summer 2017. This delay would result in a slight increase in the Connect and Manage constraint costs.

Controlling constraint costs

- 2.10 There are a number of incentives on NGET as SO to control the costs of managing constraints on the system. Our balancing services incentives scheme sets a target for these costs. NGET shares a proportion of any under or over-spends against this target, and has the incentive to keep constraint costs as low as possible. We are currently reviewing this scheme and are consulting on our intention to extend it in a similar format until 31 March 2017. NGET's licence conditions require it to act economically and efficiently. We monitor the actions of the SO and have the powers to take action if we consider NGET is in breach of its licence. We also have an innovation fund of up to £10m to support rolling out technology which can manage potential constraints.
- 2.11 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 benefitting at consumers' expense during periods of electricity transmission constraints. This could be by making dispatch decisions that create or exacerbate constraints, or by benefitting excessively from bids they make to reduce their output. The TCLC has so far had a positive impact. For example, the average amount paid per MWh to onshore wind farms to reduce generation is now significantly lower compared to before the TCLC came into force. We will continue to monitor electricity generators' compliance with the TCLC.
- 2.12 It's important that communication between the SO and the TOs is effective. It ensures that connections are made in a timely manner and constraint costs are minimised. The SO-TO code (STC) defines the high-level relationship between the parties. During RIIO-T1, we worked with the TOs and the SO, to challenge further their commitments on communication, sharing information and making decisions that could make this interaction more effective in minimising 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.
- 2.13 The more detailed principles for coordination and communication between the SO and the TOs are in the Network Access Policy (NAP). As part of our consultation on SO incentives from 2015¹⁵ and separately, we are considering other mechanisms that might support the NAP and TOs statutory obligations.¹⁶ For example, financial incentives on the SO and TOs to make decisions that maximise the benefit across the whole Transmission network and efficiently allocate any costs and benefits between them.

Carbon savings to date

- 2.14 In its quarterly reports, NGET has published information on the carbon savings made through the Connect and Manage regime. These savings arise when renewable generation connected under Connect and Manage offsets generation from other sources.
- 2.15 In last year's report, total carbon savings attributable to the Connect and Manage regime were 928,186 tonnes of carbon dioxide (CO₂). As at 31 September 2014,

¹⁵ <https://www.ofgem.gov.uk/publications-and-updates/electricity-system-operator-incentives-incentives-2015>

¹⁶ Section 9 of the Electricity Act 1989 details a requirement on transmission licensees to develop and maintain an efficient, co-ordinated and economical system of electricity transmission.

carbon savings have tripled to a total of 2,742,000 tonnes since the start of the regime.

- 2.16 NGET has said 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

- 2.17 In its quarterly reports, NGET projects carbon savings attributable to the Connect and Manage regime under the GG scenario. These reports can be found on the National Grid website¹⁷.

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

- 3.1 To reach an optimal level of network constraints in the long term, and connect new generation to maintain security of supply and bring low carbon benefits, we have been managing programmes which fund the TOs for transmission network reinforcement.
- 3.2 Two major investments projects funded prior the current price control period are due to complete in 2017.
- Beaully-Denny: this upgrades the existing 132kV transmission line to 400kV between Beaully in the north of Scotland and Denny in central Scotland. This will help to reduce constraints and losses on the network, and facilitate the connection of additional renewable generation. The majority of the northern section of the project has now been energised, with the southern section expected to be completed between November 2015 and summer 2016. In November 2014 we approved a request for additional funding and an extended construction period for the project by SPT for the forecast cost increase and delays in its section.
 - Western HVDC link: this is a new sub-sea link between Scotland and England with a capacity of 2,200MW and will help reduce constraints between Scotland and England. This is expected to be completed in summer 2017. The funding for this project was approved in 2012.
- 3.3 RIIO-T1 put in place the Strategic Wider Works (SWW) process for the approval of future major investments. In their RIIO-T1 business plans, the three onshore TOs identified transmission projects totalling approximately £8 billion (2009/10 prices) that may be needed over the next decade.
- 3.4 To date, we have received three proposals for new transmission projects in northern Scotland from SHE Transmission with a combined total value of around £1.5 billion for assessment under SWW. We have approved two of these projects: Kintyre-Hunterston and Beaully-Mossford. The first project is designed to deliver 270MW of additional transmission capacity from late 2015/16, reducing existing constraints and enabling new connections in Kintyre. The second project, Beaully-Mossford, will provide 252MW of additional transmission capacity in 2015/16 north-west of Inverness.

¹⁷ <http://www2.nationalgrid.com/UK/Services/Electricity-connections/Industry-products/connect-and-manage/>

- 3.5 In October 2014, we consulted on the efficiency of the costs, risks, programme delivery and technical design of major reinforcement of the onshore transmission system in the north-east of Scotland (the Caithness-Moray link) that will allow 1,200 MW of new onshore renewable generation to connect by 2018. We have concluded our assessment of this SWW project and have confirmed £1.1billion of funding.
- 3.6 NGET has also recently submitted a proposal for a 400kV upgrade between Hinkley Point and Seabank. We are currently in the early stages of our assessment of the Needs Case for this project.
- 3.7 We also expect new proposals to come forward over the next year for additional major transmission upgrades in Scotland as well as in England. We talk to all three TOs regularly to discuss upcoming projects and the SWW process to ensure these projects are assessed appropriately, efficiently and quickly. We have published guidance on proposing new transmission projects, the information that the TOs need to provide and how our assessment will be informed by consultation with stakeholders.

Appendices

1. Connections data
2. Associated documents

Appendix 1 – Connections data

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

Region			As at September 2013	As at September 2014	Difference
England &Wales	Total number of offers, agreements and connections		37	40	+3
	MW		21337	21547	+210
	Average reduction in connection date		3	3	0
		Number of projects connected	0	2	+2
		MW connected	0	411	+411
Scotland	Total Number		126	161	+35
	MW		15645	15503	-142
	Average reduction in connection date		5.8 years	5.4 years	-0.4 years
		Number of projects connected	15	21	+6
		MW connected	744	997	+253
Totals	Total number of offers, agreements and connections		163	201	+38
	MW		36982	37050	+68
	Average reduction in connection date		5 years	5 years	0 years

Appendix 2 - 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/>