

## The changing face of transmission access: delivering the power to meet 2020 targets

In order to meet aggressive environmental targets and ensure security of supply, vast amounts of new power generation needs to be brought on to the grid by 2020, much of it from renewable sources. With a radical overhaul required to the nation's transmission access arrangements, why did the government opt to choose the 'connect and manage' socialised access regime? *Adrian Palmer and Duncan Mills*, who were involved in modelling work for the government\*, explain.

Britain's ambitious target of producing 15% of its total energy from renewables by 2020 is expected to require around 30% of electricity output to come from renewable generation. Achievement of this goal hinges on the rapid deployment of new generation sources and a firm commitment to backing these technologies through strategic investment.

Under the historic 'invest then connect' approach to transmission access, generators had to wait to connect to the grid until all necessary reinforcements, including 'deep' network reinforcements beyond the local point of connection, had been completed.

While this policy had the benefit of minimising the cost of transmission constraints, it was not designed to deal with the pace of development and investment required to hit current environmental targets.

In Scotland, in particular, this left potential investors disenfranchised by the resulting lengthy backlog of generation projects waiting to connect. For example, at the close of 2009 there was a 'queue' of over 73GW of new generation capacity seeking connection to the grid with connection dates stretching out as far as 2025.

### Weighing up the alternatives

Following the Transmission Access Review carried out in conjunction with Ofgem, the Department of Energy and Climate Change (DECC) wanted to model the impact of a range of grid access options on generation investment, environmental outcomes, and costs to consumers, paying particular attention to the impact of different charging regimes on investment decisions and plant despatch behaviour.

This allowed DECC to analyse the full suite of options under consideration by the government, including options where constraint costs would be targeted at certain categories of generators in specific regions.

A common objective of the various options for reforming grid access was to accelerate connection of new generators to the network.

One possible downside of allowing new generators to come online early is that certain regions could – at times – have too much electricity generation relative to the grid capacity available, leading to higher transmission constraints. National Grid would then be forced to resort to short-term action to pay certain generators to adjust their output levels in order to manage the constraints on the system while still ensuring security of supply. Quantifying these incremental constraint costs was a crucial element of the modelling analysis.

### Constraint costs

The options considered for grid access reform differed in their allocation of constraint costs, both between new and existing generators and between locations.

For example, a 'Connect and Manage Targeted' regime was put forward in the initial DECC consultation, whereby a proportion of the incremental constraints associated with accelerated connection are targeted onto new generators on a regional basis. Investors would therefore be expected to take account of this in evaluating potential projects, trading off the benefits of the generation site against the likely exposure to constraint charges.

In the case of wind power, the north of Scotland generally benefits from better wind conditions, and this means that plant located in this region have the potential to generate more power. However, under a targeted regime, such generators could have faced higher constraint charges relative to comparable plant in a less congested southerly location.

An interesting finding was that targeting different levels of constraint costs would have minimal impact on generators' investment decisions and that only a targeting level of close to 100% would actively deter renewable investment and reduce incremental constraint costs.

### Alternatives

Another alternative considered by DECC was a

Locational Balancing Services Use of System (BSUoS) charging regime, whereby all generators in more constrained areas - such as the far north of Scotland – would pay a higher proportion of the constraint charges at times of congestion.

Modelling shows that this could have yielded savings in the form of lower constraint costs without significantly affecting renewable output.

The potential savings would be contingent upon conventional generators adjusting their output levels in response to anticipated constraint costs. However, Locational BSUoS would introduce additional risk and complexity to the charging regime which could have the effect of deterring investment.

**Enduring regime**

In March 2010, following consideration of the responses to the initial consultation and the results of the modelling, DECC announced that an enduring ‘Connect & Manage Socialised’ access regime was the option most likely to meet the government’s objectives.

The new coalition government subsequently published its Annual Energy Statement in July 2010, confirming the implementation of the ‘Connect & Manage Socialised’ regime.

This allows generators to connect to the grid immediately after local works have been completed,

rather than waiting for the transmission companies to carry out the ‘deep reinforcements’ of the wider network necessary to support the additional generation on the system.

**Forging ahead with the new system**

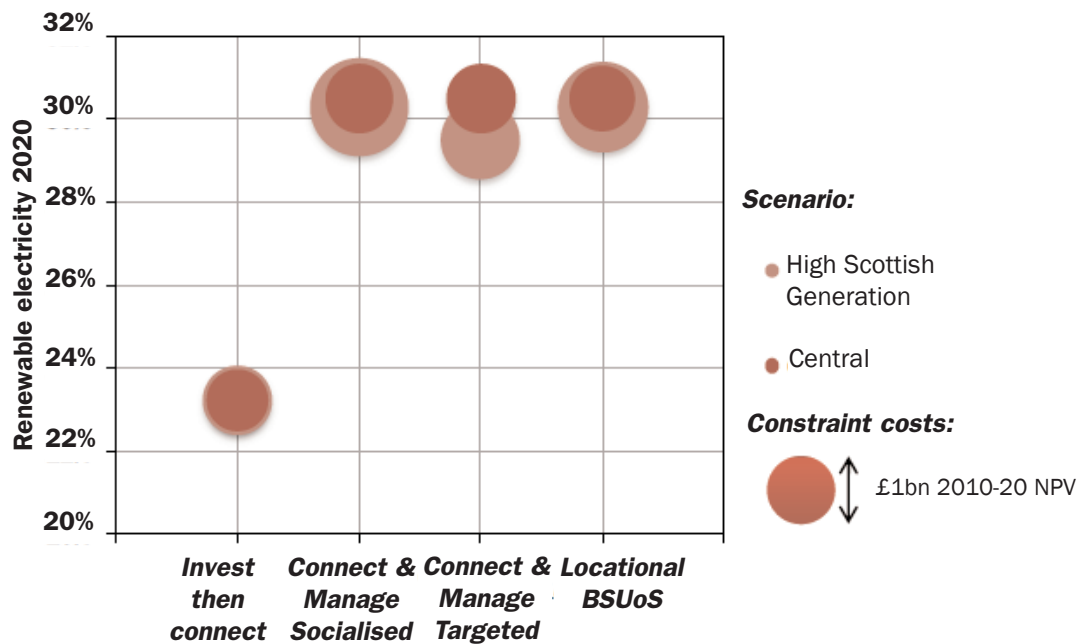
While a ‘Connect & Manage Socialised’ access regime will inevitably lead to higher constraint costs, these will be spread across all generators and suppliers on an output basis under the BSUoS charge.

This approach should also be better placed to support the push towards legally binding renewable and carbon emissions reductions targets. DECC’s intention to accelerate the integration of new generation on to the grid through ‘Connect & Manage’ reflects the high priority placed on meeting the renewable targets, as well as the relatively low level of incremental constraint costs suggested by modelling.

Overall, this transmission access regime represents the best chance of the government meeting its 2020 targets, and, as the most simple and straightforward option, is the clearest way to encourage the vital investment required to reach this goal.

*\* Adrian Palmer and Duncan Mills work for Redpoint Energy which carried out the modelling work for DECC.*

**Modelling results: renewable electricity and constraint costs**



Source: Redpoint