Oxera

Agenda

Advancing economics in business

Adrift? Regulating offshore electricity transmission networks

With stakeholders looking to offshore wind as one of the mainstays of the UK's renewable generation, how to regulate the network infrastructure has become something of a pressing issue. Tim Tutton, Oxera Senior Adviser, discusses the various options and considers the complexities of the regime that is currently being designed

At least since 2000, the UK government has had a target for the proportion of electricity to be generated from renewable sources (the initial target being 10% by 2010). At that time, it was clear that the best prospects for early expansion of renewable electricity lay with wind energy and that the scope for expanding onshore renewable generation was quite limited. The upshot of this was that a large amount of the renewable generation required to meet the government's target would have to come from offshore wind generation—and that this generation would, in turn, require new network infrastructure to deliver the electricity to shore.

One problem was that no regulatory regime existed for the remuneration of offshore networks. Now, in 2007, there is still no regulatory regime and, as yet, only very high-level conceptual thinking has been done by the relevant government departments and agencies as to what such a regime might look like.

This article explores:

- **the options for offshore network regulation;**
- **why the relatively simple and easy-to-implement options have been rejected (by Ofgem, the regulator, and the Department of Trade and Industry (DTI), as it then was[1]);**
- **the complexities of the regime that is currently being designed and how it may evolve.**

Options for regulating offshore networks

There were at least two apparently simple, internally coherent and relatively easy-to-implement options for the regulation of offshore networks. Specifically:

- the onshore transmission licences of National Grid, Scottish Power and Scottish & Southern Energy could have been extended offshore; or

- developers of offshore generation could have been left to make their own arrangements for transmitting their electricity to shore, much as developers of offshore oil and gas fields have made their own arrangements for piping oil and gas to shore.

In the first of these options, the 'regulated' model, offshore developers would approach National Grid in its role as Great Britain System Operator (GBSO) for a connection to one of the three onshore transmission systems, in the same way as onshore connections are made now. The costs of providing the relevant offshore transmission infrastructure would be recovered by the transmission licensees in the same way as for onshore infrastructure. In other words, the relevant assets would be incorporated into the regulatory asset bases (RABs) of the transmission licensees, which would earn a return determined by Ofgem at periodic reviews. The charges paid by an individual developer would be determined by the charging methodology developed by National Grid and approved by Ofgem.

In the second option, the 'merchant' model, developers of offshore generation could choose to build their own offshore transmission infrastructure, or they could try to secure access to infrastructure owned or being developed by another developer. If the regime for third-party access were modelled on what already exists for oil and gas offshore pipelines, negotiations would be covered by an industry code of practice, with the right of appeal to the Secretary of State for Business, Enterprise and Regulatory Reform.

Each option has its pros and cons (summarised in the section below), but what they have in common is that they would have both been relatively quick and simple to develop, not least because the arrangements either largely already exist in the electricity industry (the regulated model), or could have been broadly read across from the offshore oil and gas arrangements (the merchant model).

Instead, Ofgem and the DTI opted for a considerably more complex model. This 'regulated competition' model has a number of elements, some of which may be modified as the regime is developed. Currently, the model seems likely to include the following.

– As with onshore transmission, an offshore developer requests a connection from National Grid as GBSO.

– Unlike the onshore regime, responsibility for building the required infrastructure does not rest with the onshore transmission licensees. Instead, Ofgem oversees an auction of the Offshore Transmission Operator (OFTO) licence to build the offshore infrastructure required to connect the developer in question.

– The successful OFTO is remunerated through a licence which lasts for the planned economic life of the relevant assets. In effect, the 'price control' elements of the licence would have similarities with the long-term contracts seen in Private Finance Initiative (PFI) arrangements, rather than with the periodically reviewed price controls that apply to the onshore transmission licensees.

A number of even the high-level features of the regime are yet to be developed. These include identifying who will be responsible for:

– conducting sub-sea surveys;
– designing the offshore transmission scheme; and
– obtaining the relevant consents.

In short, it has yet to be decided if the OFTO will be a 'thick' transmission operator in the manner of its onshore equivalents (which design transmission schemes and are responsible for obtaining the consents needed to build them), or a 'thin' OFTO, whose job is, in effect, to build, operate and finance what others have decided is needed and which others have facilitated (through surveys, consents, etc).

Why was 'regulated competition' the chosen option?

On the basis of the economics alone, it is not obvious why Ofgem and the DTI chose the regulated competition option. This is not least because:

– if the priority was to leave the provision of offshore networks to the market and to competition, this could have been done much more simply with the merchant model;

– if there were doubts about the ability of the market to produce the desired outcome, the simple solution would have been to extend the onshore transmission licences to cover offshore;

– if the priority was to get things up and running as soon as possible to meet the government's targets for renewable electricity, this could probably have been better achieved through either the merchant or regulated model than through the chosen option.

One interpretation could be as follows.

– The DTI was uncomfortable about leaving it to the market to meet its volume objectives for renewable electricity (especially given that the merchant option would necessarily require offshore generation to bear the full costs of offshore transmission in a way that regulated options would not).

– Ofgem felt that the regulated option was inconsistent with its instinctive preference for competitive solutions when these are feasible.

For whatever reason, the likely outcome will be considerably more complicated and will take longer to implement than the main alternatives. In addition, and as noted in the following section, the model being proposed poses particular problems for the efficient functioning of the sort of long-term contracts (ie, licences) which form the core of the proposed arrangements.

Living with complexity

At the heart of the proposed arrangements are the following two main elements:

– a tender process to award an OFTO licence for the provision of the offshore infrastructure associated with a particular request from an offshore developer to connect to the GB electricity transmission system;

– a licence that will define the obligations and revenues for the holder of the licence.

Although the details of both of these elements are still very much under discussion, Ofgem has indicated that a model for the proposed arrangements will be the PFI, in which bidders compete for long-term contracts to finance, design, build and operate the likes of hospitals, schools, roads and prisons. Within this framework, Ofgem has indicated certain features which it is at least minded towards, notably that:

– the main (and arguably more or less the only) basis for choosing an OFTO will be price offered over the life of the licence (which will, in turn, last for the expected economic life of the relevant assets);

– the OFTO will, in principle, be held to this price bid, albeit that the price might include elements of indexation and that the contract might include various provisions for dealing with unanticipated events;

– the OFTO will be incentivised through the licence to deliver key 'outputs', not least availability of the transmission assets for power delivery.

As Ofgem itself recognises, there is clearly a long way to go before the detail of how offshore network regulation will work is settled. However, both stakeholders (actual and potential) and interested observers may wish to consider the following.

If Ofgem adheres to the view of choosing OFTOs on the basis of price, rather than a broader range of criteria (including price), this will probably incline the regulator to the 'thin' role for the OFTO, with others (the offshore generator, the GBSO, Ofgem) specifying what outputs the OFTO will deliver. This might be seen as implying reduced scope for putative OFTOs to propose innovation in service delivery (one of the original objectives for the PFI).

PFI schemes have a variety of mechanisms for coping with the fact that the unexpected is bound to happen over the long life of the contracts (with the unexpected including not only unexpected cost shocks, but also changes of view as to the outputs which the contractor should be delivering). These mechanisms will typically include provisions for change of law; indexation; benchmarking; and value testing. All of these will need to be considered in the context of offshore transmission.

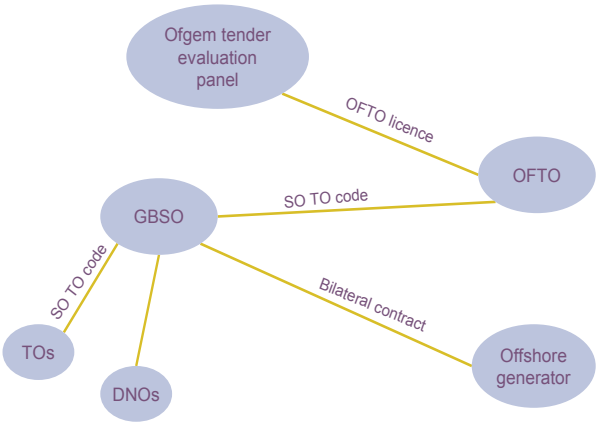
It may, moreover, ultimately prove necessary to include provisions for something like the sort of 'extraordinary review' allowed for in the (long-term) contracts which Transport for London has with the contractors responsible for maintaining, renewing and upgrading parts of the London Underground infrastructure. This is, at least in part, because technological and cost uncertainty may be greater for offshore transmission than for the average PFI project. Some of these certainties have been illustrated by, for example, the Danish experience with the offshore Horns Rev project, where multiple plant failures required comprehensive re-engineering of the project.

However, one of the main challenges to be faced in designing a tender process and contracts/licences for offshore transmission arises from the structure of the commercial relationships that seem to be envisaged. With PFI schemes, the selector of, and counterparty to, the contractor will normally be the customer for the contractor's services. This allows, at least in principle, for a relationship to evolve between user and customer in which a degree of cooperation and mutual give-and-take compensates for the inherent problem of long contracting in the face of uncertainty—ie, that contracts will inevitably turn out to be incomplete and will fail to make precise prescription for all eventualities. It is of note that the fraught relationship between Transport for London and Metronet (one of the companies responsible for maintaining and upgrading the London Underground network) has developed against the background of Transport for London having been strongly opposed to the long-term contracting out of responsibility for much of the London Underground infrastructure—and against the background of much of the drive for, and design of, the eventual contracts coming out of HM Treasury.

The London Underground experience is relevant in the context of offshore transmission because the proposed arrangements do not incorporate any direct contractual relationship between the OFTO and its 'customer', the offshore generator. (Again, this distinguishes the regulated competition model from both the merchant and regulated models.)

A stylised illustration of the 'contractual matrix' is presented in Figure 1. What is important in this diagram is the fact that, as envisaged by Ofgem, the OFTO deals with the GBSO operationally (and the GBSO is also the conduit for the OFTO's revenue), but the core contractual (ie, licence) relationship is with Ofgem. In other words, it is Ofgem that will design the tender process and specify the criteria for selecting an OFTO, and it is Ofgem that will administer the licence through the OFTO's existence.

Figure 1 Contractual matrix



Thus one of the main reasons often cited for some PFI projects succeeding more than others—a broadly cooperative relationship between contractor and customer—will be that much harder to achieve in the context of offshore transmission. This is, in part, because of a lack of a direct contractual relationship between the two key parties and also because regulatory relationships are typically and, for those concerned about regulatory capture, desirably antagonistic. Overall, offshore transmission may turn out to be a success, facilitating the achievement of the government's objectives for renewable electricity while bringing competitive pressure to bear on the costs of achieving this. However, the structure chosen will probably make achieving this rather more difficult than the obvious alternatives.

Conclusions

If offshore wind farms are going to deliver anything close to the volume of electricity required by government aspirations, there needs to be a clear regulatory regime for building and operating offshore transmission.

Ofgem and the DTI have rejected the two obvious ways in which such a regime could have been put in place quickly—one premised on leaving it all to the offshore generators and relying on competitive pressure to deliver an efficient result; the other based on leaving it to the onshore transmission licensees and relying on regulation to secure efficient delivery.

The chosen option, with its mixture of competitive and regulated elements, will be complex, will take much longer to put in place, and will have poorer efficiency incentives than even the PFI model on which it is broadly based. This is not least because it is Ofgem, rather than the customers (the offshore generators), which will be contracting for the new transmission.

Tim Tutton

[1] The DTI became part of the new Department for Business, Enterprise and Regulatory Reform in June 2007.