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Gas and Electricity Markets Authority
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Offshore electricity transmission: a new model for delivering infrastructure

Key facts

8-15%

is the estimated proportion of electricity generation expected from offshore wind by 2020 in order to meet the UK target for renewables

£52bn

is an estimate of the potential investment in offshore generation, excluding transmission, by 2020

£8bn

is an estimate of the potential investment in offshore transmission by 2020 needed to connect wind farms to the onshore grid

30 per cent	is the estimated proportion of electricity generation required from all renewable sources by 2020, in order to meet the UK's target for energy consumption from renewable sources
11 to 18 gigawatts	is the Government estimate of potential offshore wind farm generation capacity for meeting the UK renewable energy target in 2020
47 to 51 gigawatts	is the amount of offshore wind farm generation capacity that could be developed from currently identified sites
1.9 gigawatts	is the amount of offshore wind generation capacity currently installed, of which 1.3 gigawatts falls into the regime this report examines
£1.1 billion	is the estimated value of the transmission assets included in the first nine transmission licence competitions
£350 million	is the Gas and Electricity Markets Authority's publicised estimate of the net present value of savings over 20 years, from the first nine transmission licence competitions, compared to an alternative model based on existing onshore electricity transmission

Summary

Offshore electricity transmission: a new model for delivering infrastructure

1 The Treasury's National Infrastructure Plan identifies over 500 projects, together worth over £250 billion, to improve the UK's infrastructure. New forms of investment and delivery models are likely to be developed, and will be of interest to public authorities, project promoters and investors.

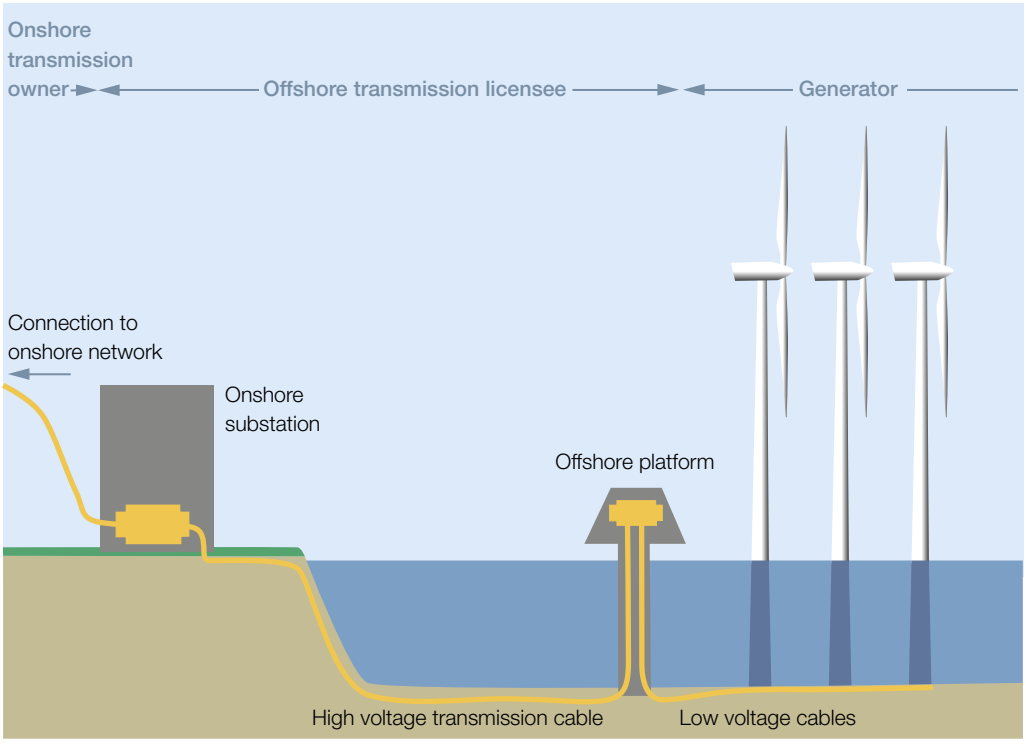
2 The Government has a target for 15 per cent of the UK's energy to come from renewable sources by 2020. The Department for Energy and Climate Change (the Department)[1] estimates that offshore wind farms have the potential to contribute 8 to 15 per cent of electricity by 2020 to help meet this target. This will require a large investment in offshore infrastructure.

3 Offshore wind farms are built and operated by electricity generators (generators). In addition to wind turbines, offshore wind farms require offshore platforms with transformer plant and switchgear, undersea cables and onshore substations (transmission assets). These transmission assets, shown in **Figure 1** overleaf, carry electricity to the onshore transmission network, which in turn takes power to where it is needed. Based on Government forecasts to 2020, investment in transmission assets of about £8 billion will be needed to connect the offshore sites to the onshore grid.

4 This report is an early examination of a new licensing model, with aspects of both competition and regulation, to deliver offshore electricity transmission infrastructure. The report considers the value for money prospects of this new delivery model based on early experience, and lessons for other areas of infrastructure investment. We intend to revisit this area at a later stage.

1 We use 'the Department' to refer to the Department of Energy and Climate Change and its predecessors in developing the licensing regime, the Department of Trade and Industry and the Department for Business, Enterprise and Regulatory Reform.

Figure 1
Illustrative offshore transmission assets



Source: The Authority

Offshore transmission licences

5 The Department and the Gas and Electricity Markets Authority (the Authority) designed a licensing regime with the following features:

- Nobody may perform offshore transmission activities without a licence from the Authority.
- The Authority may grant licences for specific transmission assets either:
  - after the assets have been built by the generator, in which case they are purchased by the licence holder on completion; or
  - before construction, in which case the assets are built, owned and operated by the licence holder.

  All licences granted so far are of the first type, as the associated assets were already complete or under construction when the licensing regime came into force.

- The Authority grants offshore transmission licences on the basis of competitions, with bidders tendering the annual amount they wish to receive in order to provide and operate the transmission assets.
- The Authority imposes price control by incorporating the amount tendered by the winning bidder into the licence.
- National Grid, as National Electricity Transmission System Operator, pays the licence holder the amount specified in the licence.
- National Grid recovers its costs through transmission charges to all electricity suppliers and all onshore and offshore generators according to a methodology agreed by the Authority.
- Suppliers and generators seek to pass on their transmission charges to consumers when they sell electricity in the competitive market.

Scope of this report

6 This report:

- describes the context for designing the offshore transmission regulatory licensing regime;
- evaluates the Department's and the Authority's design of the licensing regime;
- evaluates outcomes from the Authority's first four competitions for licences to own assets worth £254 million; and
- identifies early lessons for securing value for money from other infrastructure investment.

Key findings

The design of the licensing regime

7 The new offshore licensing regime has already delivered some benefits and has the potential to deliver more. The Department and the Authority have been innovative in creating a new competitive market for the ownership and maintenance of offshore transmission assets and have secured good levels of investment in that market in challenging financing conditions. In doing so they have also provided a degree of regulatory certainty for investors. The initial licence competitions, which were for the operation of existing assets, have also revealed costs of financing and maintenance for operating assets which the Authority can use to inform onshore regulatory settlements. As with any new market there are lessons from early transactions, which we outline further below. If the lessons are absorbed, then, as the market matures, the continued competition from new entrants and increased confidence in the regime should drive down prices to the benefit of consumers.

8 The Department made an early choice of price control to support offshore investment; offshore generators now regard the regime's impact on their investment appetite as neutral. In 2006, the Department decided to adopt price control rather than the main alternative of leaving prices to commercial arrangements between offshore generators and licensed transmission providers (the licensed merchant approach). Offshore generators strongly favoured price control at the time because it avoided a number of disadvantages for them of the licensed merchant approach. Between 2006 and 2009, the Department and the Authority consulted on and developed the detailed form of price control regime. Most offshore generators we spoke to now regard the resulting regime as broadly neutral to their investment decisions.

9 Within a price control regime, the Department and the Authority maximised the application of competition for the benefit of consumers. The Department chose to award price-controlled licences through competitions for specific offshore transmission assets. This provided more competition than either extending current onshore transmission regulated monopolies (such as National Grid for England and Wales) offshore, or awarding licences for whole zones by competition. We consider this preference for competition offshore was a reasonable decision.

10 The Department's cost benefit analysis prior to launching the regime was inadequate. After producing a series of impact assessments with limited quantified analysis, the Department published its final cost benefit analysis prior to launching the regime in 2009. In quantifying benefits, the Department assumed the competitive elements of the regime would yield savings comparable to levels claimed from using the Private Finance Initiative (PFI) rather than conventional public procurement. In our view this is not a good proxy for the competitive benefits elements of the analysis. Also, we consider the 10 to 20 per cent assumed PFI savings are tenuous as an indication of overall PFI experience. The Department recognised the limitations of the methodology it used in 2009 to quantify competitive benefits but believed it to be the best available at the time.

11 The Authority designed licence conditions which encouraged market interest but limited risk transfer to licensees, leaving significant risks for consumers. The Authority gave licensees a 20-year income, rising annually with inflation, whatever the usage of the transmission assets, which is a risk allocation with similarities to onshore arrangements. Future payments to licensees could be in the order of £17 billion based on Government's estimated range of potential offshore wind capacity in 2020. Giving licensees an inflation protected income may help attract lower-cost financing from pension funds but appears generous to licensees whose financing costs do not rise with inflation. The Authority's argument for full indexation is consistency with the onshore regime. However, the Authority did not analyse in detail the trade-off between the investors' interests and the cost of the inflation risk that would be borne by consumers. Current licences also do not include incentives for the operators to minimise power losses or to share refinancing gains.

Outcomes from the first competitions for licences

12 The Authority secured good competition for licences in challenging circumstances but transaction costs have been high. The Authority launched its first competitions in March 2009, at a time of financial market volatility. Despite these adverse conditions, it attracted 29 expressions of interest for the initial competitions and had awarded four licences for assets worth, in total, £254 million by January 2012. Combined costs for winning bidders, generators and the Authority were £7 million to £8 million per deal. These transaction costs represented 7.5 to 21.1 per cent of the value of assets transferred, which partly reflects early deals involving transmission assets with relatively low values. The Authority expects that transaction costs for future competitions will be a significantly lower proportion of asset values.

13 Further work is needed to establish robust benchmarks for transmission construction costs. In order to secure value for money, the Authority must continue to ensure that the regime provides workable incentives for efficient construction of transmission assets. The Authority has disallowed £22 million from transfer values for the first four projects. In addition, the Authority is developing independent 'should cost' benchmarks for transmission assets but these would not yet provide robust target costs in advance of construction.

14 Competition can encourage innovative and efficient maintenance, but generators offering maintenance services below cost will discourage independent entrants to the maintenance market. The range of bids for operation and maintenance costs illustrates the benefits of competition. Some generators offered to perform operations and maintenance work below cost in order to ensure they retained some influence over the availability of transmission assets. This may reduce amounts tendered for licences, but it compromises value for money by discouraging efficient independent maintenance providers from participating in bids.

15 Some of the initial costs of debt and equity offer potentially favourable outcomes for consumers but there is scope for improving financing costs. For the initial four competitions costs of debt were 2.1 to 2.2 per cent above then current 'risk-free' rates of 2.8 to 4.1 per cent offered by UK gilt yields. We consider this represented a competitive deal for licensees in the prevailing banking environment. Investors' expected returns on equity were in the range of 10 to 11 per cent, in line with other electricity transmission companies. This is, however, higher than the recent returns to investors buying into post-construction PFI projects where the maturity of the PFI market may be a reason for the lower returns accepted by investors. One of the licences has been sold and the sale price has not been disclosed. As the market matures, and those providing finance become familiar with the risks, we would expect the Authority to be able to obtain better financing terms. Consumers may gain if the benefits from these financing terms are passed on to them; the scale of any benefit would need to be proven.

16 Whether the regime will definitely yield savings, and the possible amounts involved, depend heavily on assumptions about the comparator. In 2010, the Authority publicised savings of £350 million for consumers from the first nine competitions in present value terms compared to the notional alternative of extending onshore transmission monopolies offshore. The Authority believes there will be savings on financing costs and operation and maintenance costs although it has not yet quantified the latter. It estimates that lower financing costs will deliver savings of £293 million. The estimate is sensitive to small changes in the assumptions. In our view, there are alternative reasonable assumptions which would significantly reduce or eliminate the predicted savings. In addition, the estimated saving on finance costs includes £161 million that would arise from lower tax payments by licensees relative to the comparator. The Authority included this tax saving as its remit is to consider the impact on consumers. However, this saving to consumers is likely to be matched by a corresponding additional cost to taxpayers.

Lessons to learn

17 This early review of the new licensing arrangements creates opportunities for the Department and the Authority to learn lessons for future transactions. The competitions we have reviewed are expected to be the first of many. The Authority can learn lessons from this early review to influence current and future offshore transmission competitions and also the future basis of onshore transmission pricing. Areas for attention are:

- the extent to which the licensing arrangements attract competition and encourage investment in the offshore wind power sector;
- the risk allocation in licence arrangements and in particular the risks allocated to consumers;

- the information needed to evaluate and challenge bidders' proposed pricing;
- the potential for reducing financing costs; and
- the extent to which onshore transmission pricing can be improved in the light of the early offshore transmission licensing experience and the Authority's savings estimate.

18 There are also lessons for other public authorities in developing new commercial models. Issues which are relevant to many new commercial arrangements include the following:

- Option appraisal – the importance of the choice of delivery model and the need to review earlier decisions as more information becomes available.
- Separating operations and construction – the possible advantages of seeking separate financing arrangements for the operating period.
- Balance of risk and reward – allocating risks so as to attract investment without exposing consumers or taxpayers to excessive costs.
- Competition analysis – understanding existing markets, and designing changes which either sharpen incentives for efficiency or ensure efficiency gains are passed on to consumers.
- Transparency – consulting widely in designing new models, and ensuring that costs and benefits are visible and disclosed to consumers and taxpayers as well as investors.

Conclusion on value for money

19 In developing this new regime, the Department and the Authority sought to protect the interests of consumers while understanding the needs of generators and investors. The first four licences have delivered benefits by attracting new market participants and finance with competition holding down tender prices. However, transaction costs to date have been high and there are some significant risks for consumers. The current regime is a complex mix of regulation and competition. It is not clear it will deliver optimal costs for consumers. For value for money to be optimised, future licence awards need to ensure that only appropriate risks are allocated to consumers and the high transaction costs of the initial competitions are reduced.

Recommendations

a **The Authority should seek future licence conditions which ensure that consumers are only exposed to appropriate risks.** In the current licence conditions, which helped to establish the new competitive market, consumers remain exposed to many of the risks of offshore transmission. The Authority should develop licence conditions for future competitions that:

- balance the costs of consumers' exposure to inflation risk against the lower bids for licences which index-linking of payments should secure;
- consider the benefits to consumers of introducing mechanisms to capture a share of any refinancing gains; and
- provide incentives for designers and operators to minimise power losses on cables.

b **The lessons of the initial competitions should be used by the Authority to improve the efficiency of future competition tenders.** In the initial competitions the lengthy periods between submitting tenders and closing deals raised transaction costs and risked losing value for consumers. In particular, the Authority should seek to:

- reduce the time between submitting tenders and awarding licences in future competitions in order to reduce transaction costs; and
- ensure that information from generators is considered in finalising licensees' income, after preferred bidders are chosen.

c **The Authority should continue its work in developing independent information on the efficient costs of providing offshore transmission assets.** Robust benchmarks are essential to eliminate the risk of consumers having to fund the inefficient provision of offshore transmission assets. The Authority should use that information when setting target costs for new assets and transfer prices for existing assets.

d **There is scope to improve value for money for consumers through lower equity financing costs.** The Authority should:

- draw on the issues raised in the 2012 National Audit Office report, *Equity investment in privately financed projects* to consider and address any inefficiencies in bidders' pricing of equity; and
- in particular, require licensees to disclose the price at which any interests in the licence are sold. This will assist the Authority in understanding whether the gains available through the secondary market imply there are inefficiencies in the pricing of equity in licence bids.

e **The Authority should complete a fully quantified estimate of costs and savings from the first tender round.** This estimate should be developed with the industry to test the robustness of assumptions. It should be presented as a range taking account of the effect that different assumptions about the comparator will have on the calculations.

f **The Authority should make use of the costs evident from offshore transmission competitions to inform future price reviews for onshore activities.** The offshore transmission market provides useful data which can help the Authority set financing allowances and efficiency targets for onshore transmission and distribution.