National Audit Office

REPORT BY THE
COMPTROLLER AND
AUDITOR GENERAL

HC 22
SESSION 2012-13

22 JUNE 2012

Gas and Electricity Markets Authority
Department of Energy and Climate Change

# Offshore electricity transmission: a new model for delivering infrastructure

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National Audit Office

Gas and Electricity Markets Authority
Department of Energy and Climate Change

# Offshore electricity transmission: a new model for delivering infrastructure

Report by the Comptroller and Auditor General

Ordered by the House of Commons
to be printed on 21 June 2012

This report has been prepared under Section 6 of the National Audit Act 1983 for presentation to the House of Commons in accordance with Section 9 of the Act.

Amyas Morse
Comptroller and Auditor General
National Audit Office

19 June 2012

HC 22 London: The Stationery Office £16.00

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



Printed in the UK for the Stationery Office Limited on behalf of the Controller of Her Majesty's Stationery Office

2497878 06/12 PRCS

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The National Audit Office study team consisted of:
David Howes, Richard Wade, Susannah Drazin and Israel Ochwo, under the direction of David Finlay

This report can be found on the National Audit Office website at www.nao.org.uk/offshore-wind-farms-2012

For further information about the National Audit Office please contact:

National Audit Office
Press Office
157–197 Buckingham Palace Road
Victoria
London
SW1W 9SP

Tel: 020 7798 7400

Enquiries: www.nao.org.uk/contactus

Website: www.nao.org.uk

Twitter: @NAOorguk

# 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.

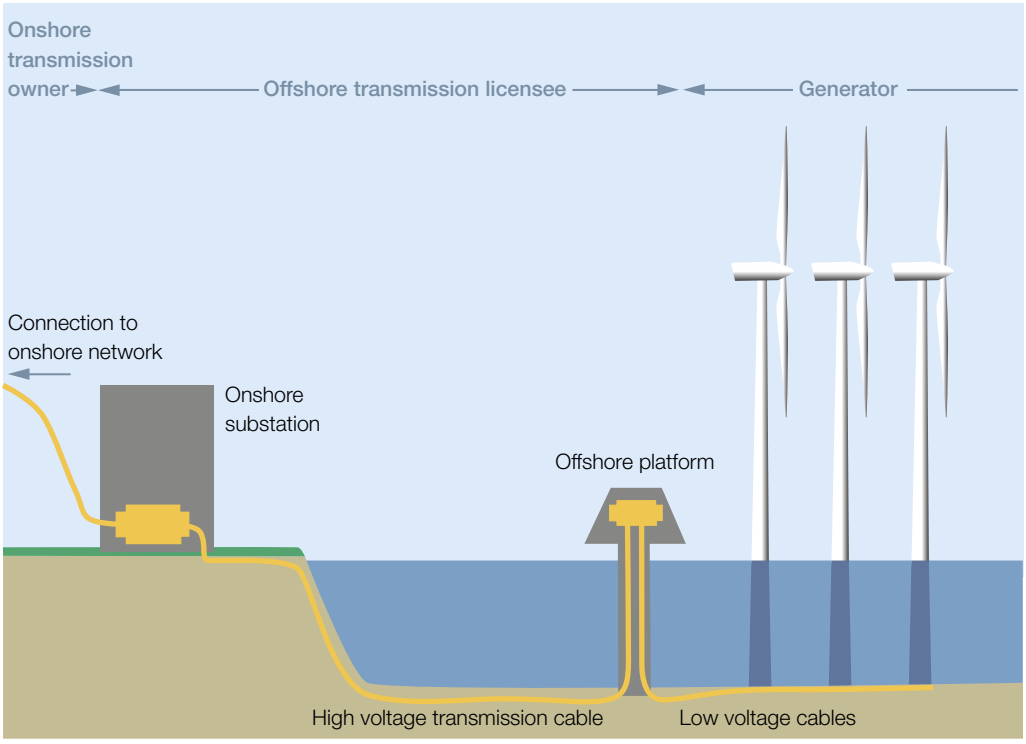
**2** The Government has a target for 15 per cent of the UK's energy to come from renewable sources by 2020. The Department for Energy and Climate Change (the Department)[1] estimates that offshore wind farms have the potential to contribute 8 to 15 per cent of electricity by 2020 to help meet this target.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

# Part One

## Offshore electricity transmission

**1.1** The maintenance and development of the nation's economic infrastructure is a high priority for the Government, which has set out its aims in the National Infrastructure Plan. The Plan identifies over 500 projects, together worth over £250 billion to improve the UK's infrastructure. Delivering the plan will involve attracting new private investment. New forms of investment and delivery models are likely to be developed, and will be of interest to public authorities, project promoters and investors.

**1.2** This report examines a new competitive licensing model to deliver offshore transmission infrastructure, which is itself a new asset class. The report considers both the value for money prospects of this new delivery model based on early experience, and lessons for other areas of infrastructure investment. This part of the report sets out the landscape for offshore electricity generation and transmission within which the licensing regime was designed and implemented.

### UK renewable energy plans include a major contribution from offshore wind power

**1.3** The Department of Energy and Climate Change was created in October 2008 and is responsible for designing government energy policy. It inherited that responsibility from the Department for Business, Enterprise and Regulatory Reform, which had in turn taken over from the Department of Trade and Industry in June 2007. Throughout the report we use 'the Department' to refer to any of these departments. The Department's overall objectives for the electricity market are to:

- ensure the future security of electricity supplies;
- drive the decarbonisation of our electricity generation; and
- minimise costs to the consumer.

**1.4** The 2009 European Union Renewable Energy Directive sets a target for the UK to derive 15 per cent of its total energy consumption from renewable sources by 2020. The Department estimates that meeting this target will require 30 per cent of electricity to be generated from renewable sources by 2020, equivalent to 117,000 gigawatt hours of electricity in that year.[2] The Department estimates that offshore wind could provide 11 to 18 gigawatts of generating capacity by 2020, contributing between a

2 A gigawatt is a measure of power equal to one billion watts. A gigawatt hour is one gigawatt of power expended for one hour.

third and a half of renewable electricity's share of the 2020 target. This could require an estimated investment of £52 billion[3] in offshore generation plus a further £8 billion in associated transmission assets. The Department encourages generation of renewable electricity by requiring suppliers to source a specified proportion of their electricity from renewable sources or face a penalty. Eligible generators receive Renewables Obligations Certificates for the power they generate and sell these certificates to suppliers to meet their renewables obligations.

**1.5** The Crown Estate, which manages the Crown's offshore exploitation rights, grants leases for developing offshore wind farms. Forty-four wind farm projects are currently in development, 24 of which are either operational or under construction. In 2010, The Crown Estate awarded rights to exploit nine further offshore zones, each of which is likely to contain several projects. Currently identified sites have a potential generating capacity of 47 to 51 gigawatts.[4] A list of wind farm projects and sites is in Appendix Three.[5]

## Offshore transmission brings power from offshore wind farms to the onshore grid

**1.6** Offshore transmission assets normally comprise (see Figure 1 in the Summary):

- cables to transport electricity from the offshore wind farm to onshore substations;
- onshore substations to transform the electricity from the wind farm to the voltage required for transmission through the onshore network; and
- in some cases, offshore platforms with transformers and control equipment where electricity from wind turbines is collected and transformed to high voltage.

**1.7** The Electricity Act 1989 prohibited companies from undertaking electricity supply, generation or transmission onshore without a licence from the Gas and Electricity Markets Authority (the Authority). The Authority and its supporting office, the Office of Gas and Electricity Markets, are responsible for protecting consumers within the legislative framework set by government.

**1.8** The Energy Act 2004 extended licensing requirements to offshore generation and transmission. This was, in particular, to ensure that:

- companies undertaking offshore transmission activities comply with the requirements of industry transmission codes, charging arrangements and technical standards;
- transmission asset owners don't extract excessive charges from competitors requiring access to assets; and
- the Authority could enforce compliance and protect consumers.

3 This estimate is based on a mid-range pathway conducted by PricewaterhouseCoopers for The Crown Estate (to be published June 2012) which uses a capacity figure of 17 gigawatts.
4 The Crown Estate, *UK Offshore Wind Report 2012*, 2012.
5 Available at: www.nao.org.uk/offshore-wind-farms-2012

**1.9** The Act also gave powers to the Authority to make regulations about awarding licences on the basis of competition. The Act did not require offshore transmission licences immediately, allowing time for the Department and the Authority to consult on and design a licensing regime. We examine the key consultations and design decisions in Part Two.

## Consumers ultimately pay the costs of electricity generation and transmission across the entire system

**1.10** The following bodies are involved in generating, transmitting and supplying electricity to consumers (**Figure 2**):

- **Offshore wind farm developers and generators (generators)** are companies which build, own and operate offshore wind farms. They sell their electricity to suppliers through the wholesale electricity market. Prior to introduction of the licensing regime generators also built, owned and operated the transmission assets linking the offshore wind farm to the onshore grid.
- **Electricity suppliers** buy electricity from generators on the wholesale market and sell it to domestic and business consumers.
- **The National Electricity Transmission System Operator** role for the whole of Great Britain is performed by National Grid under a regulated licence. It operates the national transmission system and balances electricity demand and supply across the transmission system. It also designs a methodology, agreed by the Authority, for charging the costs of licensed transmission owners (see below) to generators and suppliers.
- **Onshore transmission owners** operate under licences granted by the Authority and are National Grid in England and Wales, and Scottish Power and Scottish Hydro Electric Transmission in Scotland. They develop and maintain the onshore transmission systems for their areas. Onshore transmission owners are licensed and regulated by the Authority and charge the National Electricity Transmission System Operator for their services.
- **Offshore transmission licensees** own and maintain offshore transmission assets and are regulated by the Authority. The development and implementation of the offshore transmission licensing regime is the subject of this report. We discuss the design of the regime in Part Two and the outcomes of the first licence competitions in Part Three.

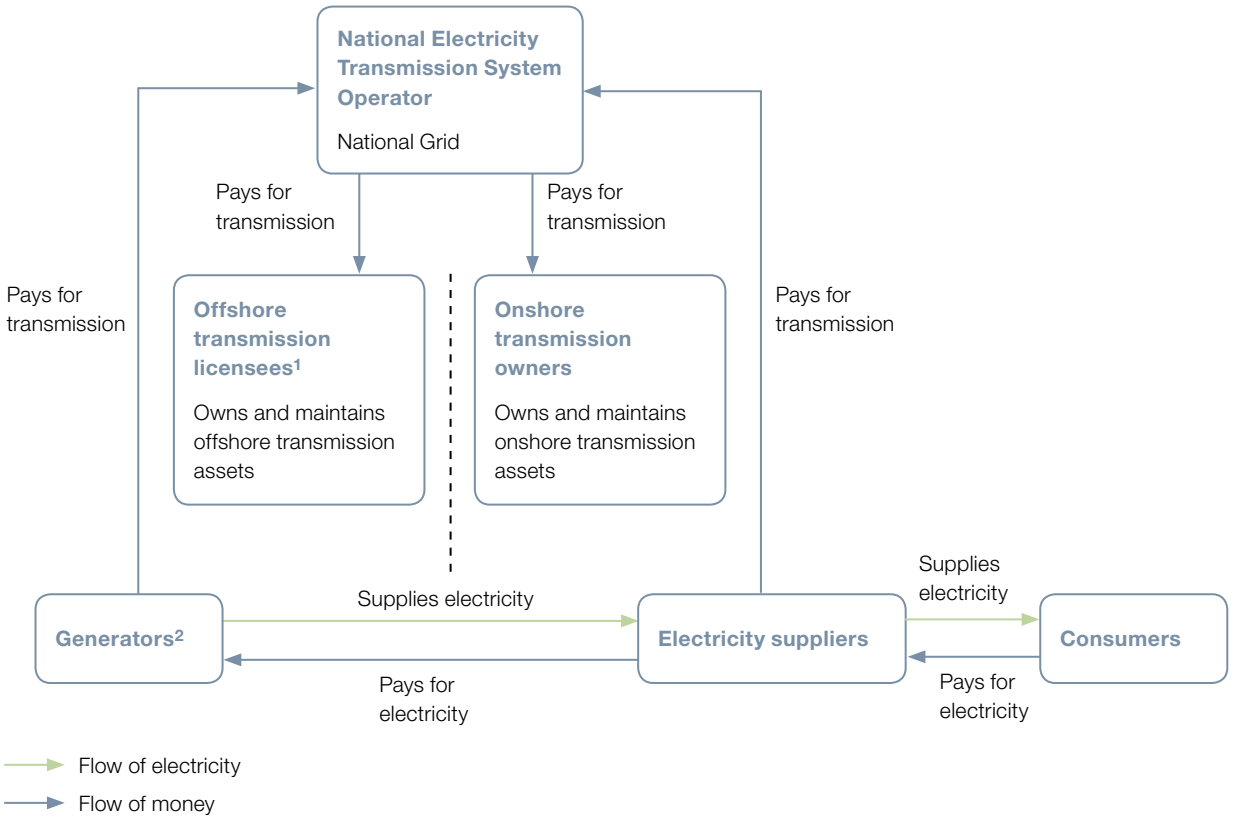
**1.11** Figure 2 shows how costs are passed on to consumers. National Grid as National Electricity Transmission System Operator pays onshore transmission owners and offshore transmission licensees for providing transmission services. National Grid then allocates charges between generators and suppliers in accordance with its agreed methodology. Generators and suppliers look to recover their costs through their customers. Generators sell their electricity to suppliers in the competitive electricity

wholesale market. Suppliers in turn sell that electricity to domestic and business customers in a competitive market. If generators and suppliers are unable to recover all of their costs through these markets their investors effectively bear the irrecoverable share of costs through low returns or losses in shareholder value.

**1.12** The Authority regulates the amounts paid to onshore transmission owners and offshore transmission licensees. Although consumers will normally bear most costs of onshore and offshore transmission indirectly through the price they pay for electricity, the form of licensing, and the price guarantees and risk exposure within it, have a major impact on the relative exposure of investors and consumers to different cost and price risks. Based on the Government's estimate of potential offshore wind capacity in 2020, the Authority's offshore licensing regime could see future payments to licensees in the order of £17 billion over 20 years. This figure could rise if further wind farms are developed beyond those needed to meet 2020 objectives.

## Figure 2

Consumers pay for electricity and associated generation, transmission and supply costs




**NOTES**

1 The new offshore transmission licence regime is the subject of this report.

2 Generators who produce renewable electricity also receive a taxpayer funded subsidy in the form of Renewables Obligations Certificates.

*Source: The Authority*

# Part Two

## Design of the licensing regime

**2.1** This part examines key decisions taken, sometimes jointly and sometimes separately, by the Department and the Authority in designing the offshore transmission licensing regime. It shows that, whilst the regime has introduced competition and regulatory certainty, other benefits are not as clear, and some risks remain with consumers. This part covers:

- the choice of regulatory approach;
- the use of competition;
- the licence conditions and risks to consumers; and
- the cost benefit analysis.

### 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

**2.2** In 2005, the Department and the Authority consulted on two main regulatory approaches:

- Price control similar to onshore transmission, where licensed companies would provide transmission services at prices agreed by the Authority.
- A merchant approach, where the Authority would licence companies as fit to provide transmission assets and services but would not control prices. The consultation anticipated generators securing such offshore transmission licences but acknowledged that independent merchants could also enter the market.

In either case the Authority would only grant a company a transmission licence if it demonstrated compliance with the necessary requirements to provide transmission services.

**2.3** The merchant approach potentially offered the simplest and most direct commercial incentives to provide and operate offshore transmission assets efficiently. However, the Department concluded that the merchant approach would not support delivery of the levels of offshore wind generation needed to meet the UK's renewables targets. Generators' responses to the consultation were a factor in arriving at this conclusion.

**2.4** Generators' responses to the consultation favoured price control for the following reasons:

- The consultation indicated that price control would probably be accompanied by extension of National Grid's systems operator role offshore, and that licensees would generally be independent of generators. Offshore transmission costs would therefore be charged to National Grid in the first instance, who would recover them from generators and suppliers through annual charges. By contrast, no such extension of National Grid's systems operator role was envisaged under the licensed merchant approach, and generators holding transmission licences themselves would pay upfront capital costs for transmission assets.

- If price control was accompanied by application of National Grid's charging methodology, that methodology would need to be consistent as between onshore and offshore transmission. The current onshore charging methodology allows some of the costs of transmission to be shared between all suppliers and generators who use the network. Consistency would require that offshore charges also allowed for such sharing. By contrast, if generators built their own transmission assets under a licensed merchant approach they would have to pay the full costs themselves.

**2.5** Our interviews with stakeholders indicated that some generators lost enthusiasm for price control once they understood that National Grid would charge most of the costs of an offshore transmission link to the generator using that link, with only limited spreading of costs across suppliers and other generators. For an illustrative offshore wind farm, National Grid indicated that the generator would pay 85 per cent of the offshore transmission licensee's charges. We consider the sharing of the remaining 15 per cent of costs across all network users too small to strongly influence generators' investment decisions.

**2.6** EU rules which came into force in March 2012 require separation of generation and transmission activities. If the licensed merchant approach had been adopted, generators would now have to sell their transmission assets to independent licensed merchants, or have them built and owned by such merchants in the first place. Generators would therefore avoid upfront capital costs for transmission assets, or would get them reimbursed when they sold their transmission assets to an independent merchant.

**2.7** The Department and the Authority designed and commenced the regime on the basis that licensees rather than generators would build new transmission assets. Following the launch of the regime generators expressed a strong desire for an option to build new transmission assets themselves, before transferring them to licensees, in order to have greater control over the date of their availability. In 2010, the Department and the Authority agreed to allow this option.

**2.8** The current licensing regime and its EU legal context have developed significantly since options were set out in the 2005 consultation. Our interviews indicated that most generators we spoke to do not now expect the current regime to influence their plans for investment in offshore wind farms. Based on those interviews and discussions with other stakeholders, we consider that the level of government subsidy for renewable generation, the nature and extent of guarantees of future price levels for the electricity generated, and the likely price levels for electricity from competing sources, are more important determinants of investment appetite. Establishment of the regime has, however, provided a degree of regulatory certainty for investors. Evidence of investor appetite comes from The Crown Estate competitions for offshore wind farm site leases. Competitions launched before and after the details of the regime became known received 41 and 40 bids respectively. This indicates that generators' appetite to invest in offshore wind has not been significantly changed by the introduction of the regime.

## Within a price control approach, the Department and the Authority chose to maximise the application of competition for the benefit of consumers

**2.9** Having chosen to use price control, in 2006 the Department and the Authority considered whether and how to use new powers, introduced by the Energy Act 2004, to introduce a competitive tender process for granting licences. The principal alternative would have been to extend the monopoly remits of National Grid, Scottish Power and Scottish Hydro Electric Transmission into offshore waters adjoining their onshore territories. The Department and the Authority assumed a competitive market would yield more efficient prices than could be set by the Authority as regulator using similar methods to onshore regulation. We consider this preference for competition to be a reasonable decision, especially given the lack of historical data on offshore transmission costs to inform the Authority's view on efficient pricing. Nevertheless, competitions add to the complexity of the regime and introduce transaction costs (see Part Three).

**2.10** In November 2006, the Department and the Authority consulted on two options for the form of competition:

- awarding exclusive licences for whole offshore zones; and
- awarding licences for specific transmission links.

**2.11** Licences for whole zones could encourage coordinated design of links within zones and connection sharing between generators better than awarding licences for specific links. In the long-run, coordination and sharing connections should lower the costs of the whole network. However, the concern was that licensing whole zones would create new offshore monopolies and the costs of new transmission links would not benefit from competitive pressure. At the time, the Department and the Authority were not able to quantify the relative costs and benefits of the two options with any accuracy as there was very little suitable cost data. However, we consider the choice to prioritise competition was reasonable as network coordination can be achieved in different ways (see Part Four).

## The Authority designed licence conditions which encouraged market interest but limited risk transfer to licensees, leaving significant risks for consumers

**2.12** The Authority has a duty to protect consumer interests. In designing the regime the Authority had to ensure this duty was met while attracting entrants to a new market for offshore transmission. Potential bidders and funders are attracted by conditions which limit risks to themselves but these have implications for consumers (**Figure 3**).

**2.13** Under the terms of offshore licences, licensees' total income rises with retail price inflation. The Authority's argument for this is consistency with the onshore regime. Onshore inflation indexation is embedded in the allowed return on regulated assets. Nevertheless, the exact form of onshore indexation can be adjusted at eight-yearly regulatory settlements. Full indexation appears generous to offshore licensees since their financing costs, which account for around eighty per cent of their average annual costs, can be fixed when the licence is awarded and need not be exposed to inflation. Consistency with the approach onshore need not have dictated indexation arrangements for the very different form of offshore licences.

### Figure 3
Licence terms attractive to licensees and their funders

| | |
|---|---|
| Annual inflation | Licensees' annual income increases annually for 20 years, in line with retail price inflation. Licensees hedge themselves against inflation risk but consumers bear the full impact of inflation rises. |
| No obsolescence or demand risk | Licensees' income is guaranteed for 20 years, even if wind farms become obsolete or demand for their energy reduces. The same situation exists for onshore electricity transmission. This is more of a risk for consumers where the future of a particular energy source, such as onshore and offshore wind power is uncertain, There is a risk that consumers will continue to pay for assets that are no longer in use. |
| Limited availability risk | If a licensee fails to make transmission assets available, its income may be reduced by up to 10 per cent in any one year, and up to 50 per cent over five years. But this is considerably less than the cost to the generator of lost income owing to the unavailability of transmission capacity. Consumers would ultimately bear this impact. |
| No sharing of gains from debt refinancing in the transitional licences | The Authority did not include a gain sharing arrangement in its initial licences as it judged the likelihood of refinancing to be low given that the deals did not involve financing construction risk. This means that if a licensee is able to refinance its loan to get cheaper financing in the future, it does not have to share the benefit with consumers. The Authority is, however, considering sharing refinancing gains in future licences. |

*Source: Authority licence documents*

**2.14** There are some arguments in favour of allowing licensees' total income to rise with inflation. In particular it may help licensees attract financing at lower rates. Pension funds, which have liabilities linked to inflation, may be able to offer lower financing costs than banks. However, the Authority did not fully assess the benefits of potentially lower financing compared to the inflation risk borne by consumers. It has not assessed the level of inflation at which the arrangements would become unduly costly for consumers.

## The Department's cost benefit analysis prior to launching the regime was inadequate

**2.15** The Department published impact assessments at each stage of the consultation which discussed costs and benefits. There was some quantification of the costs and benefits but the assessments were mainly qualitative. The Department published its final, quantitative, cost benefit analysis of savings from competition prior to launch of the first competitions in March 2009. It estimated that its preferred option for licensing would yield savings, compared with doing nothing, of between £461 million and £1,390 million in present value terms, excluding any transitional arrangements.

**2.16** In our opinion, the Department's quantification of savings was inadequate. The Department's basis for these savings was work done by London School of Economics Enterprise and Arthur Anderson commissioned by the Treasury Taskforce in the early years of the PFI programme. Using department business case projections from 15 early PFI projects referred to in reports by the National Audit Office (NAO) the report for the Treasury Taskforce estimated that these early PFI projects would deliver savings of 10 to 20 per cent compared to conventional public procurement. The Department recognised that this was an imperfect comparison but considered it the best available. In our opinion the Department's final estimate of financial benefits was inadequate for two reasons:

- The Authority's offshore licensing regime replaced private sector procurement of transmission assets, rather than replacing conventional public procurement. In our view this is not a good proxy for a mixture of regulation and competition replacing a commercial market.
- Our previous reports have cast doubt on the robustness of PFI savings estimates. The 10 to 20 per cent savings cited in the Department's impact assessment were not estimated by the NAO and we consider implying that such savings estimates will be indicative of overall PFI experience is tenuous.

The Authority subsequently made its own estimate of savings from the first round of competitions once it had started implementing the regime (see Part Three).

# Part Three

## Competitions for licences – the evidence so far

**3.1** This part examines the evidence from the first four licence competitions. It shows that the Authority generally ran the competitions well in challenging circumstances to attract new transmission market entrants with largely favourable financing. However, the costs of these early transactions were high and the extent of savings is not clear. This part covers:

- effectiveness of the competitions;
- transaction costs of running the competitions;
- the values at which transmission assets are transferred to licensees;
- the cost of the licences; and
- estimated savings from the first round of competitions.

**3.2** Outcomes from the first four licences to be awarded are summarised in **Figure 4** overleaf.

### The Authority attracted competition in challenging circumstances

**3.3** A regulator running a competition to determine the price for services provided by one private body to another is innovative. Bringing the early competitions to conclusion was challenging. It required the Authority to make the market aware of the new licence arrangements, and bidders to access finance during a volatile financial market following the 2008 credit crisis. Nevertheless, the competitions attracted good levels of interest and competition (**Figure 5** overleaf). We consider that the attractive licence terms (see Figure 3 in Part Two) would have played a part in raising private sector interest.

## Figure 4
### Offshore transmission licences awarded so far

**The total annual payment to licensees for the first four projects is £28.6 million or £566 million over 20 years at today's prices**

| Site | Date licence awarded | Licensee | Wind farm capacity (gigawatts) | Value of transmission assets (£m) | Annual payment to licensee[1] (£m) |
|---|---|---|---|---|---|
| Robin Rigg | March 2011 | Transmission Capital Partners | 0.18 | 66 | 6.5 |
| Gunfleet Sands | July 2011 | Transmission Capital Partners | 0.17 | 49 | 6.0 |
| Barrow | September 2011 | Transmission Capital Partners | 0.09 | 34 | 4.8 |
| Walney 1 | October 2011 | Blue Transmission (Macquarie and Barclays) | 0.18 | 105 | 11.0 |
| **Total** | | | **0.62** | **254** | **28.3** |

**NOTE**

1 In first year. Payments are increased each year in line with inflation.

*Source: The Authority*

## Figure 5
### Market interest in licence competitions

**Despite challenging economic conditions the initial competitions for offshore transmission licences attracted good levels of interest**

| | Round one | Round two tranche a |
|---|---|---|
| Number of licences being competed | 9 | 3 |
| Expressions of interest | 29 | –[3] |
| Long-listed bidders | 14 | 7 |
| Short-listed bidders | 6 | 4 |
| Preferred bidders | 4[1] | –[4] |
| Companies awarded licences so far | 2[2] | – |

**NOTES**

1 The preferred bidders were: Transmission Capital Partners (four projects); Blue Transmission (three projects); Balfour Beatty (one project); and a consortium of Balfour Beatty and Green Energy Transmission (one project).

2 Three licences have been awarded to Transmission Capital Partners and one to Blue Transmission.

3 There was no Expression of Interest stage for this round.

4 Transmission Capital Partners has been selected as preferred bidder for one project. Preferred bidders for the other projects in this round have not yet been announced.

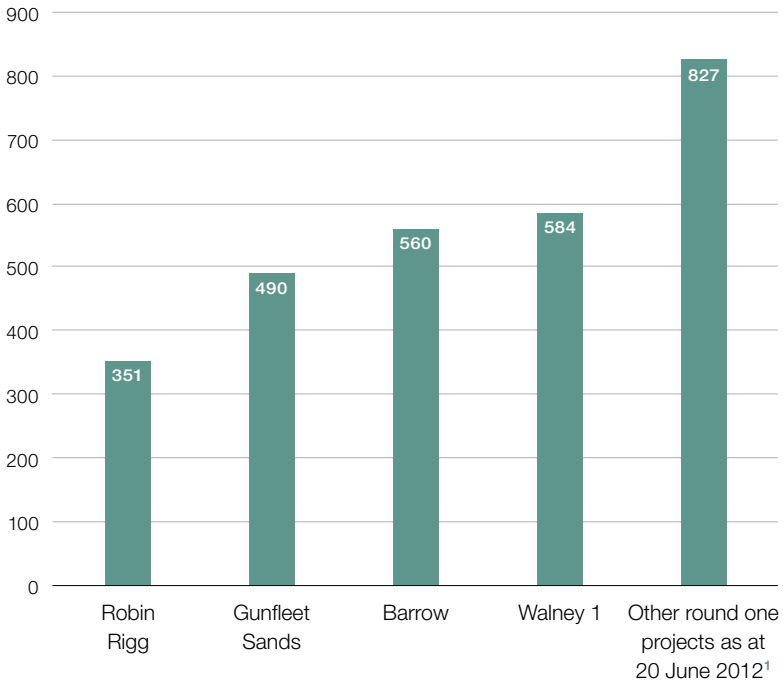
*Source: National Audit Office analysis of Authority data*

## The Authority mainly ran the competitions well but delays happened because wind farm construction was not completed as anticipated

**3.4** Parties involved in the competitions thought that the Authority generally ran the competitions competently and professionally. It took longer, however, for the Authority to close the competitions than the 100 days it indicated in its published tender rules (**Figure 6**). It awarded the first four licences between 350 and 600 days after receiving the tenders. At 20 June 2012, the other first round competitions were still ongoing after more than two years. Most delays happened because of technical and commercial issues including completion and testing of the transmission assets. Delays happened on all projects including two where wind farms were already operational.

### Figure 6
Time between submitting the tender and licence award

**Competitions have taken longer than anticipated**




**NOTE**

1 The tender submission stage of the Greater Gabbard competition was re-run about a year after the initial launch to allow simplification of transaction structure and reduced pricing. The Ormonde project had an additional 'best and final offer' submission stage because initial bids were too close to make a decision.

*Source: National Audit Office analysis of Authority data*

**3.5** The Authority took steps to limit late price changes from the asset transfer negotiations by scrutinising all price increase requests and only accepting those that fell into tightly defined categories. Some changes to terms, however, may have been agreed between the generator and the preferred bidder with no mechanism to ensure any resulting decrease in the preferred bidder's risks was reflected in a lower licence price.

## Transaction costs have been high

**3.6** The Authority recovers its costs by charging fees to bidders and the generators for running the competitions and arranging the transfer of transmission assets. Generators' transaction costs are added to the price licensees pay for the transmission assets. Winning bidders then recover these, and their own costs, through the licence revenue stream (**Figure 7**).

**3.7** The transaction costs, at between £7 million and £8 million for each competition appear high as a proportion of asset value. This partly reflects early deals involving transmission assets with relatively low values. The transaction costs for Walney 1, where the assets have higher value, are a lower proportion of asset value than for the first three deals. The Authority expects this trend to continue for future competitions. The Authority will need to focus on reducing transaction costs as the different parties become familiar with the regime.

### Figure 7
Transaction costs for the first four offshore transmission licences

**Transaction costs for each of the first four licences have been between £7 million and £8 million**

| | Robin Rigg | Gunfleet Sands | Barrow | Walney 1 | Totals |
|---|---|---|---|---|---|
| Licensee[1] (£m) | 6.8 | 5.9 | 5.8 | 6.2 | 24.7 |
| Generator (£m) | 0.7 | 1.4 | 1.3 | 1.7 | 5.1 |
| **Total (£m)** | **7.5** | **7.3** | **7.1** | **7.9** | **29.8** |
| Value of transmission assets (£m) | 65.5 | 49.5 | 33.6 | 105.4 | 254.0 |
| Transaction fees as a percentage of asset value (%) | 11.5 | 14.7 | 21.1 | 7.5 | 11.7 |

**NOTES**

1 Only the winning bidder recovers its costs through the regime.

2 Licensee and generator transaction costs include an element of Authority costs.

*Source: Authority data*

## The Authority adopted a reasonable approach to setting transfer values for completed assets but is not yet in a position to set robust cost targets before construction

**3.8** The Authority sets values, known as transfer values, for the assets licensees buy from generators. The Authority seeks to set transfer values representing the efficient costs of building the assets. Transfer values determine how much finance the licensee must raise to purchase assets. The combined asset and financing costs are the main part of the costs bidders seek to recover in the licence revenue stream they bid for.

**3.9** The Authority commissioned forensic accounting reports from Ernst & Young to independently verify the costs actually incurred by generators. It also sought further independent advice on technical cost overruns. As set out in their published cost assessment reports, the Authority disallowed £22 million, 8 per cent, from transfer values for the first four projects. The Authority has attempted to develop independent 'should cost' benchmarks for transmission assets but these would not yet provide robust target costs in advance of construction.

## Some elements of financing costs offer potentially favourable outcomes for consumers but there is scope to reduce them further

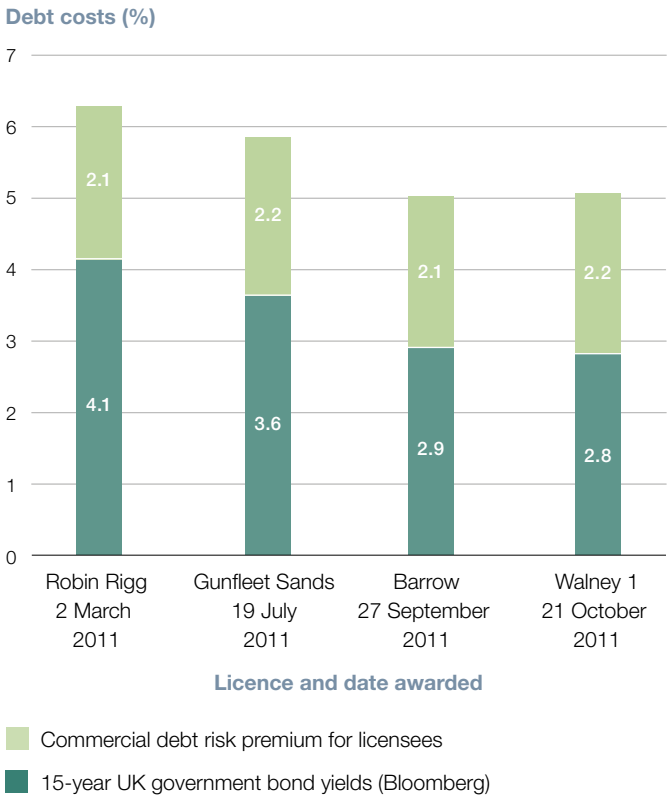
**3.10** Financing costs averaged 79 per cent of total costs for the four licences that have been awarded. Financing costs are made up of a combination of the costs of debt (borrowing) and equity (investors' capital at risk). Licensees typically rely on debt for between 80 per cent and 90 per cent of their financing.

**3.11** Bidders were seeking finance in 2011 when the cost of debt had increased following the credit crisis. For the initial four competitions costs of debt were 2.1 to 2.2 per cent above the 'risk free' rate of 2.8 to 4.1 per cent represented by 15-year UK gilt yields (**Figure 8** overleaf). Based on our knowledge of market rates we consider this risk premium range was competitive in the prevailing environment for medium- to long-term bank lending. If electricity markets work efficiently the benefit of these rates will be passed on to consumers. The costs of debt in these deals can reasonably be compared with PFI debt terms in the same period which incorporated risk premia around 2.5 to 3.0 per cent. We would expect debt costs for licensees to be lower than for PFI because PFI rates reflect the additional risks of construction. The limited risk transfer in the Authority's licence terms would have contributed to the low debt costs but, as we explained in Part Two, some risks ultimately lie with the consumer and may add to consumer costs in the long term. In addition to commercial bank financing, Walney 1 attracted 50 per cent of its debt from the European Investment Bank (excluded from Figure 8), which offers low-rate finance to some projects which support certain EU objectives including environmental sustainability.

## Figure 8

Risk premium on licensee commercial debt above 15-year UK gilts

**The costs of debt were 2.1 to 2.2 per cent above 15-year UK gilt rates**




*Source: National Audit Office analysis of Authority and Bloomberg gilt market data*

**3.12** An established market in offshore electricity transmission licences, debt markets improving or new, cheaper sources of finance are factors which could allow licensees to save costs by refinancing on more favourable terms. Current licences do not include any provision for sharing refinancing gains as the Authority judged that the likelihood of refinancing was very low, and less than in PFI where initial financing costs reflect construction risk and the larger sized deals make the costs of refinancing after construction worthwhile. The Authority is, however, considering including a refinancing gain share arrangement in future deals to allow for situations where there may be more scope for refinancing.

**3.13** Equity returns priced into the winning bids for licences awarded so far were in the range 10 to 11 per cent in nominal terms. We have compared these returns with the following two benchmarks:

- **Other transmission companies** Drawing on data which Grant Thornton provided to the Authority, we calculated benchmarks based on equity returns for other electricity transmission companies. These benchmarks suggest equity returns of between 10.3 and 11.3 per cent might have been expected at the dates when licence deals were concluded. Risks are not wholly comparable as benchmark transmission companies' activities may warrant higher equity returns because the businesses are more exposed to risks of construction work and volatility in market conditions. Against this, the transmission benchmark companies are less risky to the extent that their markets are more developed with equity easily traded.
- **PFI projects once construction risk has been dealt with** Our recent report on PFI equity found that, since mid-2009, rates of return to equity investors buying into such operational projects were in a range around 8 to 9 per cent. PFI is not a directly comparable market but nevertheless provides a useful benchmark of the price for investing in the operation of existing assets. The fact that PFI is a mature market may be a factor in explaining the lower returns investors accept.

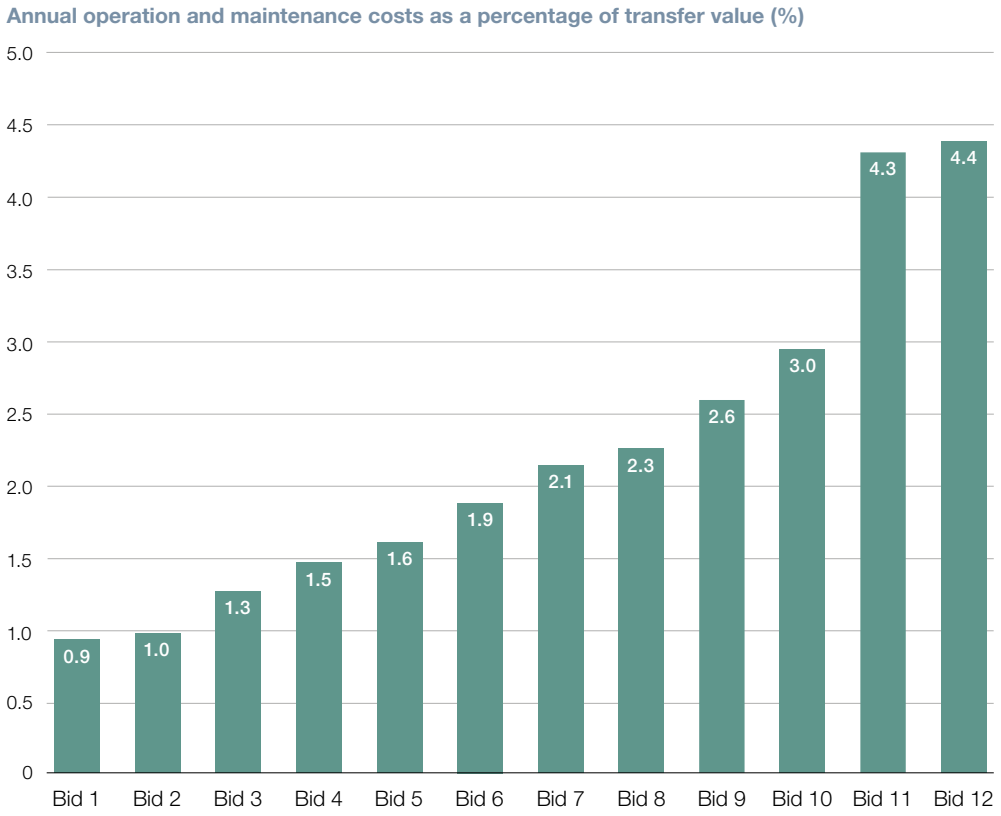
Macquarie sold its share in Walney 1 for an undisclosed sum to Mitsubishi within two months of being awarded the licence. The development of a market for the onward sale of equity investments in projects which provide stable long-term cash flows was a feature of the PFI market.

## Competition can encourage innovative and efficient maintenance, but generators offering to perform maintenance activities below cost will discourage independent entrants to the maintenance market

**3.14** Annual operation and maintenance costs within bids for the first round of licences varied from 1.0 to 4.5 per cent of the value of transmission costs (**Figure 9** overleaf). Assuming that each bidder offered the keenest price they felt able to deliver, the range illustrates the potential benefits of competition. Winning bids were at the lower end of this range, indicating that some of these benefits of competition were captured by the Authority in its licence awards.

## Figure 9
### Average annual costs of licensee operations and maintenance

**Annual operation and maintenance costs in bids for the first four licences varied, with winning bids at the lower end of the range**




**NOTES**

1 Costs are for each of the 12 bids for the first four licences awarded.

2 Figures may not sum due to rounding.

*Source: National Audit Office analysis of Authority data*

**3.15** The licensee subcontracts operation and maintenance work, which accounts for around twenty per cent of their annual costs. Generators were keen to carry out this operation and maintenance work to help them safeguard the transmission of electricity from their wind farms. Some generators told us they offered to perform operation and maintenance work below cost, since most of their fees would come back to them as transmission charges anyway. Generators are carrying out this work for all four licensees appointed so far although we understand this is not expected for all remaining first round projects. Below-cost generator offers may limit opportunities for efficient independent operations and maintenance contractors to enter the market. They also limit the Authority's ability to see the true costs of undertaking operations and maintenance work, and make it harder to judge the relative merits of bids which accept below-cost generator offers and those which don't.

## Whether the regime will definitely yield savings, and the possible amounts involved, depend heavily on assumptions about the comparator

**3.16** In August 2010, the Authority began to publicise savings for consumers of £350 million (in present values) from the first round of licence competitions. The Authority estimated that payments to the first nine licensees (based on financial models at preferred bidder selection) would be 13 per cent lower than the revenue that would have been allowed under conventional price regulation to an onshore transmission owner such as National Grid to operate similar assets.

**3.17** The Authority does not have a full quantified analysis of all the savings it expects. The main element relates to lower financing costs and the Authority has developed a model which currently predicts savings on financing costs of £293 million. The Authority also believes that there have been other savings, for example on operation and maintenance costs. It has done some initial analysis of these but figures are not yet available. The Authority has updated its estimate as deals close and plans to publish a fully updated savings forecast once the first nine competitions have concluded.

**3.18** In our view, the Authority's savings estimate is not clear for the following reasons:

- The estimate is based on assumptions in the notional comparator about depreciation, gearing and tax allowances which are sensitive to small changes. In our view, there are alternative reasonable assumptions that would significantly reduce or eliminate the predicted savings.
- The estimate does not take account of possible changes from future price reviews under conventional regulation which would affect the comparator.

In addition, the £293 million savings on financing costs are predicated on lower tax payments by licensees, which account for £161 million of those savings. The offshore transmission licensees are expected to pay less tax than the onshore comparator because they have more debt (higher gearing) and thus benefit from more tax relief on interest charges. 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.

# Part Four

## Lessons to learn

**4.1** This part considers what lessons can be drawn from the competitions so far and how to apply these to future licence competitions and more widely. In continuing to pursue the objectives for offshore licensing (see Part Two), there are areas for the Authority to consider to further minimise costs for consumers.

### The Authority will need to set appropriate incentives to encourage efficient provision of assets

**4.2** The generator-build option means that the long-term regime could look very much like the transitional regime. A survey by the Authority in early 2011 indicated that a large majority of generators intended to build their transmission assets themselves. This may change as generators become more comfortable with the capabilities of licensees and further details of the licensee-build option become available but it remains likely that some generators will continue to build their transmission assets.

**4.3** It will be especially important that the Authority builds on what it has done so far to establish credible benchmarks for assessing the efficient cost of offshore asset provision and applies these robustly in estimating and determining transfer values. Under generator-build, generators will design and construct transmission assets knowing that assets will be sold at a price set by the Authority. Target costs based on realistic and robust benchmarks will encourage efficient construction of assets.

**4.4** The transitional licences contain no conditions about the performance of the transmission assets regarding power losses. This is not a significant concern for existing assets, as licences cannot influence losses on built assets. But it will be important for the Authority to incentivise good transmission performance in its handling of licences for new assets.

### The Authority can use the experience of licensing competitions to inform onshore regulatory settlements

**4.5** The licensing regime creates pressure on the regulated monopoly onshore transmission companies. The competitions have given the Authority a clear picture of the costs of electricity transmission. Bids include planned financing costs and operation and maintenance costs. Moreover, licence conditions require licensees to submit annual

returns detailing the actual levels of income and costs at a reasonably granular level of detail. Over time, the Authority will develop a database of useful cost information which it can use to inform base cost levels and efficiency assumptions when it sets prices for onshore electricity transmission every eight years.

## There are potential savings from coordinating investment in transmission for future wind farms

**4.6** Wind farms built so far have generally used single point-to-point connections where transmission assets serve only one wind farm. Many future wind farms will be much further from the shore. In these cases it may be more efficient to develop a coordinated transmission network which is shared by multiple wind farms rather than point-to-point connections. The Department extended the role of the National Electricity Transmission System Operator, National Grid, to cover offshore as well as onshore transmission to help ensure new network connections are delivered in a coordinated and efficient way. The Authority estimates that coordination could save 8 to 15 per cent, or £0.5 billion to £3.5 billion on total offshore transmission costs for the nine new wind farm zones announced in 2010.

**4.7** The Department and the Authority published the conclusions of their joint offshore transmission coordination project in March 2012, setting out proposals to enable appropriate coordination. The task is a challenging one that involves balancing possible efficiencies from coordination against the risk of building assets earlier than they are actually needed. If the proposals are fully effective this could have considerable benefits for consumers.

## There are wider lessons for promoting infrastructure investment from the initial experience of the licensing regime

**4.8** The licensing regime represents a new model for infrastructure funding, combining a competitive approach to appointing licensees with a long-term index-linked income and restricted risk exposure. We are aware that some commentators and stakeholders are considering how the model might be used in other contexts. In **Figure 10** overleaf we detailed the core elements of risk analysis, competition analysis and transparency which we think are essential to inform proper judgements on securing value for money from new approaches to financing infrastructure investment.

## Figure 10
Core elements for judging likely value for money

**Risk analysis**

Analyse the risks associated with the investment and who manages the risks under different approaches.

The analysis should assess the risks to all parties including consumers and taxpayers. It should recognise where risks are borne initially by one party (such as an electricity generator) but may be passed on to consumers subject to market conditions. Risks removed from the new investment vehicle should be assigned elsewhere unless they are eliminated or mitigated by the proposed new arrangements. The risk analysis should be as comprehensive as practicable and should cover risks including:

| | | |
|---|---|---|
| availability | depreciation | latent defects |
| changes in law | design | obsolescence |
| construction | deliverability | operations |
| decommissioning | financing | regulatory issues |
| demand | inflation | |

Where possible, evidence from previous investments and the market should be used to price risks, in particular in terms of the premium charged by investors and lenders for bearing a risk. Where this is not possible some estimate of the scale of the different risks should inform the impact assessment for the new investment approach and the options around it.

**Competition analysis**

Analyse what competitive or other commercial pressure will be brought to bear on costs and prices under alternative investment approaches.

If direct competition is introduced into a market where commercial pressure already applies, the rationale for doing so should be clearly articulated. Similarly, if direct competition is to be introduced within a commercial market or within a price-regulated monopoly, the reasons should be spelled out, and options for directly addressing previous inadequate arrangements considered. The analysis should also explain how any savings from enforced competition within a commercial or regulated market will be captured for consumers or taxpayers, or both. Analysis should take on board the full range of legal and regulatory constraints that exist to understand the full consequences of design choices.

**Transparency**

Conduct an open and extensive consultation with interested parties, with departments or regulators championing consumer and taxpayer interests.

While a sequential approach to consultation may make the process manageable, early decisions should not be regarded as irreversible during consultation on new approaches. To test the effectiveness of new arrangements in their early stages, financial models for new investment vehicles must be transparent. This should ideally capture any changes to costs and income for other stakeholders in the system so that the full impact of a new investment vehicle can be assessed.

*Source: National Audit Office analysis*

# Appendix One

## Methodology

| Method | Purpose |
|---|---|
| Review of the options appraisals and the licence conditions. Review of the consultations on the form of the licence and regime. | To assess whether all reasonable options were robustly assessed at the outset and whether the terms of the licence, including allocation of risks, are appropriate. To assess the quality of the consultation process. To understand how the licence is developing. |
| Quantitative analysis, including benchmarking where possible, of:<br>• bidders' financial models for the first four licences awarded;<br>• estimated and final transfer values of transmission assets; and<br>• the number of bidders in competitions for licences and The Crown Estate rounds. | To assess the cost of the licences awarded and whether individual cost components appear reasonable. To assess the level of competition for licences and the level of interest in developing offshore wind. |
| Review of the Authority's savings estimate. | To assess how robust the estimates are and whether the savings are likely to be achieved. |
| Semi-structured interviews with:<br>• officials from the Department, the Office of Gas and Electricity Markets, The Crown Estate and National Grid;<br>• wind farm generators;<br>• companies that expressed an interest in bidding for, or who did bid for, a licence; and<br>• lenders to licensees. | To understand the perspectives of the different parties involved in the process. To further explore issues arising from other methodologies. |

A more detailed methodology is available on our website www.nao.org.uk/offshore-wind-farms-2012.


Design and Production by
NAO Communications
DP Ref: 009835-001

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Published by TSO (The Stationery Office) and available from:

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ISBN 978-0-10-297715-8

9 780102 977158