

Electricity Market Reform Consultation Paper; Dec 2010

Government Energy Market Reform Proposals:

The Government has identified the main objectives of the reforms as being the reduction of the UK's carbon footprint through decarbonisation of the electricity market, and to sure up security of supply.

Decarbonisation Reforms:

1. Carbon Price Support;

The Government proposes to introduce a carbon price support mechanism from 1 April 2013 to support investment in low-carbon generation. This will be achieved by the **climate change levy (CCL)** and **fuel duty** being levied on *all* fossil fuels used to generate electricity in the UK.

In most cases, fossil fuels currently used to generate electricity are exempt from CCL. The Government proposes to remove these CCL exemptions and to tax these commodities at rates that take account of their average carbon content. These rates will be known as the 'CCL carbon price support rates', and will be different from the main CCL rates, which will be retained.

Additional features of the proposal are;

- Electricity used to generate further electricity will be exempt from the CCL
- The liability of electricity supplied to the final consumer which has been generated through the burning of fossil fuels, will remain unchanged under the CCL, as will the treatment of imported electricity.
- Energy generated by the burning of fossil fuels in the UK, which is subsequently exported, will be liable to the relevant carbon price support rates.
- All fossil fuels burnt in CHP power stations will be subject to the CCL (at the carbon price support rates) or fuel duty, regardless of their rating through the CHP Quality Assurance Programme (CHPQAP)
- Subject to State Aid approval, partial relief will be provided to generating stations burning fossil fuels, if they are equipped with carbon capture and storage technologies.
- Supplies of fossil fuels to auto-generators will continue to be liable under the CCL and fuel duty, but at the carbon price support rates. In addition, auto-generators will no longer be able to reclaim the CCL or fuel duty charged on energy generated through the burning of fossil fuels, and subsequently exported to the electricity transmission and distribution networks.

By creating a floor price on carbon, the aim is that 'clean', low-carbon energy generation will be made more competitive. This is because an increase in the cost of carbon raises the wholesale price of electricity generated by high carbon emission technologies, thus making low carbon technologies more able to compete.

2. Low Carbon Generation Revenue Support (Obligations & Feed-in-Tariffs)

The Government has assessed a number of policies designed to give low-carbon investors more certainty over future revenues. They are;

- A **low-carbon obligation** on electricity suppliers, essentially an extension of the Renewables Obligation. This obligation would require suppliers to source a certain percentage of their energy from low-carbon generation. Suppliers would have to present certificates to demonstrate that they had met their obligation, and these certificates would have a value, giving the low-carbon generator an additional revenue stream.
- **Feed-in-Tariffs (FITs)** providing guaranteed prices to generators for the low-carbon energy they generate. There are three main forms of FIT:
 - **Premium FIT** – A static payment which generators receive in addition to their revenues from selling electricity in the wholesale market.
 - **Fixed FIT** – A static payment which generators receive in place of any revenues from selling electricity on the wholesale market.
 - **FIT with a Contract for Difference (CfD)** – A long-term contract set at a fixed level, where variable payments are made to ensure the generator receives the agreed tariff for their electricity. Generators sell their electricity into the market then receive a top-up payment (or, as the 2008 CfD payment year illustrates, may repay revenues to consumers, if electricity prices are higher than the agreed tariff). The top-up payment or repayment is calculated as the difference between the average market wholesale price and the agreed tariff level.

The idea is that FITs will make low-carbon generation attractive because generators will be guaranteed a minimum price for the electricity that they generate. Because the overall returns under a Premium FIT are governed by long-term electricity prices, this is the least likely of the three to facilitate the governments' decarbonisation targets. This is because low-carbon generators will be vulnerable to fluctuations in the long-term market value of electricity (caused by low gas-prices, for example) under a Premium FIT, which may make low-carbon generation a more expensive and therefore unattractive option. Fixed and CfD FITs avoid this risk by setting a fixed tariff which is resistant to fluctuations in the long-term market value of electricity.

In addition, it is suggested that FITs will encourage investment in low-carbon generators, by removing a large proportion of the risk associated with the investment. A risk associated with low-carbon generation is how much revenue the plant will earn over the life of the investment. The greater the certainty of revenues that can be offered to investors, the lower the project cost of capital. So if the Government provides revenue support which partly or fully insulates generators from electricity price fluctuations; this helps to reduce the risk profile of a project for the generator and therefore reduces the rate of return investors need on their investment compared to projects where no such protection is available.

3. Emissions Performance Standard (EPS)

An Emissions Performance Standard (EPS) is a regulatory limit on the amount of CO₂ released into the atmosphere by an electricity generating station.

'The Coalition Agreement envisages an EPS playing a role in a package of reforms to prevent the construction and operation of new unabated coal-fired power stations, which represent the most carbon-intensive form of electricity generation. This does not mean that new coal-fired power stations have no part to play in providing electricity in the future, but it does mean that action must be taken to reduce their emissions if they are to play a role.'

The EPS will prevent investment in new unabated coal-fired power stations and their operation without an appropriate level of CO₂ abatement. The EPS will;

- Apply to individual power stations
- Set an annual limit on the total amount of CO₂ permitted per unit of installed capacity
- Apply to new power stations only, and with an ongoing principle of *grandfathering*, i.e. the level of the EPS on the date of consent of a new power station will apply for the economic life of the installation.
- Be consistent with a Carbon Capture and Storage Programme covering the full range of approaches to Carbon Capture.

Security of Supply and market operation reforms

Through facilitating a transition to low-carbon generating technologies there is a concern that the decarbonisation proposals set out above could exacerbate security of supply risks. As such the Government is keen to implement measures which will enhance security of supply, and market operation more generally.

Improving the operation of the current market;

1. Reforms to the balancing arrangements;

In the current market arrangements, decisions on how much capacity is needed are taken by those parties investing in new power stations. Potential investors will consider the outlook for supply and demand for electricity and the forward price curve. Based on an assessment of these factors, they decide on whether investing in new capacity would deliver an economic return. For such a system to operate effectively, clear price signals are necessary to provide the incentives to invest.

With this in mind the Government has suggested reforms to the current balancing arrangements. Under the current system the National Grid Systems Operator ensures that the supply of electricity to the grid matches demand. At the present time the Systems Operator incurs the cost of increasing supply or reducing demand to balance the system. These costs are then recovered through 'cash-out payments' made by those parties out of balance, i.e. those who used or provided a different amount of electricity than they agreed.

There are three groups of actions relating to balancing that the Government has considered:

- Reforming the calculation of cash out payments;
- Improving the System Operator (SO)'s approach to procuring reserves necessary to maintain system balance; and
- Actions to better manage balancing of intermittent renewable generation.

Reforming the calculation of cash-out payments:

For a number of reasons, the cash out price may not fully reflect the costs of ensuring supply and demand are in balance and at times will be too low. If prices in short-term markets do not fully reflect generating capacity, forward prices will also be muted. These forward prices are commonly used by developers as the basis of investment appraisals. Reforming the cash out price so that it is a truer reflection of the costs of that imbalance (i.e. to create more cost-reflective prices) should therefore give stronger signals for investments in new capacity. The following are suggested as options for reform:

- **Changing to a single cash-out price:** There are currently different cash out prices for selling and buying electricity. Although this provides a strong incentive for balancing it may not be truly cost reflective. An alternative would be a single price (or one with a fixed spread between buy and sell);
- **Changing to more marginal pricing:** The current scheme is "pay-as-bid" and the imbalance price is the average of the most expensive 500MWh of balancing actions. A scheme closer to marginal pricing would result in higher and more cost-reflective prices at times;
- **More effective allocation of reserve contract costs:** The costs associated with the System Operator purchasing short-term operating reserve (STOR) are allocated using the previous year's reserve usage as a proxy. These costs could be better targeted to the periods in which the reserve is actually used and so enhance cost reflectivity; and
- **Putting a price on currently non-costed actions:** Customers could be compensated for involuntary voltage reductions and power cuts and the costs included into the cash-out price so that these actions (effectively free) are properly reflected.

Improvements to procuring of balancing services: A further way to improve cost-reflectivity of cash out and to also provide greater transparency is to introduce a reserve market. A reserve market is a short-term market (for example, a day-ahead) run by the system operator to procure reserve resources. A reserve market would enable the value of reserves to be factored into the cash out prices in a way that more accurately reflects conditions on the day, making cash out prices better targeted at those participants causing any shortfall.

Actions to manage intermittent renewables: Wind generation is more exposed to being out of balance, because of the intermittent nature of the generation, and as such faces greater risk of paying cash out penalties. Some form of centralisation for variable renewable generators could allow variable renewables to face lower risks of imbalance and sell this output in the electricity market. For example it may be the case that different wind-farms are out of balance in different directions (i.e. some generating more than predicted, some less), by aggregating these imbalances the overall imbalance is reduced.

Reducing the balancing risks for renewables could increase overall investment in renewable generation by tackling the barriers to entry that are created through cash out payments. It could also reduce the overall costs of balancing the system. Aggregation services such as this could be provided by a private company. The Government proposes to wait-and-see if such services are developed privately as a result of existing incentives to reduce balancing costs and an increasing opportunity for aggregation as the share of intermittent generation increases.

2. *Introducing a Capacity Mechanism;*

Currently market participants decide the optimal capacity margin. An alternative is to determine the level centrally, and introduce a policy to reward the provision of capacity to ensure this margin is met. This is a capacity mechanism. In effect, this transfers the management of the risk associated with underestimating capacity requirements to the government from market participants. In order to incentivise a specific level of capacity, an explicit cash payment relating to capacity would have to be introduced. The idea is that a capacity mechanism can improve security of supply in the following two ways;

1. By providing a regular revenue stream it should deliver greater investment in new capacity, by reducing capital costs.
2. A higher capacity margin can be achieved than would be achieved in an energy-only market.

The following have been suggested as ways of implementing a capacity mechanism;

- **Capacity payment:** Reimburses all generators through a simple payment for available capacity. The level of payment is set by a central body, rather than through a competitive process;
- **Capacity obligation:** An obligation on suppliers to contract with generators for a certain level of capacity or pay a buy-out price. The price for capacity is then set in a decentralised way, through these contracts;
- **Capacity auction:** The capacity volume is set centrally a number of years (for example, three years) in advance. Price is determined by auction and paid to all resource (existing and new) clearing the auction. This mechanism is currently operated in the PJM and ISO-NE markets in the USA;
- **Reliability option:** Also a forward auction, but is a financial market instrument rather than a physical instrument; generators must be available to the System Operator for dispatch above a defined strike price. This model has been proposed by several academics, but is untested; and
- **Tender for targeted resource (TTR):** Capacity payments are only given to resource needed to make up any shortfall in the market. The level of payment is set through a competitive tendering process. Conditions on how the resource operates limit the market distortion.

The Energy Market reform document emphasises the need to ensure that the market enables an adequate return to be made on efficient levels of capacity, including that which is only occasionally needed. The Government is proposing the following design preferences for a capacity mechanism:

- A centralised system (i.e. an obligation on a single central body such as the system operator) rather than decentralised system;
- An approach in which volume is set rather than the price of capacity;
- A targeted approach, rather than offering payments to all generators.

This consultation will run until 10th March 2011.