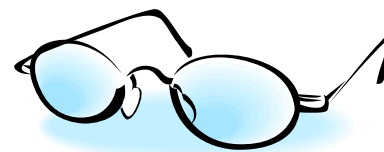


Electricity Market Reform, the Government's vision

Short- or far-sighted?



The UK Government has a challenge. Electricity markets will be under pressure from three directions: as the electrification of industry and transport leads to growth in demand, as existing generating plant retires and as large-scale expansion of renewables generation risks leaving large gaps in capacity on windless days.

Massive investment will be required. Incentives must be designed simultaneously to encourage both renewables investment and the investment in flexible thermal plant and gas infrastructure for reserve that will only be fully utilised when demand peaks coincide with low wind. These are the challenges for which the electricity market was not originally designed.

In its Electricity Market Reform (EMR) Consultation Document published on 16 December 2010¹, the Department of Energy and Climate Change (DECC) set out how it thinks the challenge can be met². It follows previous analysis by Ofgem under its Project Discovery and is also driven by the commitments in the Coalition Agreement between the two governing parties.

DECC identifies the key objectives of decarbonisation, security of supply and

affordability, and sets out four major areas for reform:

- Carbon price support**, holding up the costs for carbon emitters
- Feed-in tariffs**, supporting revenues for non-carbon emitters
- Emissions performance standard**, ensuring any new or upgraded coal-fired capacity meets challenging emission standards
- Capacity payments**, to pay for flexible capacity when capacity made available by the market is not enough

In this viewpoint, we ask:

- Does DECC have a **viable vision** of how the sector will develop?
- Has DECC identified the **right goals**?
- And are these the **right policy proposals**?

Decarbonisation

The electricity sector is central to the Government's objectives for decarbonising the economy. Industry, transport and heating will need to be substantially electrified and electricity generation decarbonised.

The aim is for the electricity industry to be largely decarbonised by 2030: the Committee on Climate Change in its Fourth Carbon Budget report set a 2030 target for electricity generation of 50 g/kWh compared to 452 g/kWh in 2009, and the government has followed this by committing to a 50% emissions reduction from 1990 by 2027.

Analysis conducted for the EMR suggests that current policies would lead to a 35% share of renewables by 2030 and a fall in carbon intensity only to 200 g/kWh. It needs to be much lower. Achieving the

The Coalition Agreement

The coalition agreement largely confirms the decarbonisation objectives of the previous government, but commits to some of the levers that should be used to reach these:

- A full system of feed-in tariffs in electricity
- A floor price for carbon
- An emissions performance standard to massively reduce emissions from coal-fired power stations
- Reform of energy markets to deliver security of supply and investment in low carbon energy.
- Instructing Ofgem to establish a security guarantee of energy supplies.

targets will, therefore involve massive changes in both the behaviour of consumers and the levels of investment in new technologies.

Two of the main obstacles identified by the government are:

- ❑ Current carbon prices that are too low to support renewables investments without subsidy
- ❑ Uncertainty over future increases in carbon price, raising risk to unacceptable levels for financing new generation

To overcome these obstacles, the government has identified three key areas for reform:

- ❑ carbon price support
- ❑ feed-in tariffs
- ❑ emissions performance standard.

Carbon price support

Carbon is currently priced through the EU Emissions Trading Scheme (ETS). The EU ETS allocates permits to emit CO₂ according to national allocation plans. Those permits (carbon allowances or EUAs) can be traded, which reveals a price for carbon.

In competitive generation markets, the carbon price should encourage investment in low-carbon technologies. But uncertainty over the future level of carbon prices undermines this. Towards the end of Phase I of the ETS, the carbon price fell

to zero due to overly-generous allocation plans. This political uncertainty weakens signals for investment in low-carbon generation because it is the type of risk that investors can least easily judge or manage.

To address this issue, the coalition agreement committed to support the carbon price. The proposal is to do this by adapting the Climate Change Levy (CCL) and extending it to cover electricity generation.

The CCL would be applied to fossil fuels used by electricity generators, ending their current exemption. The new 'carbon price support rate' would set a floor on the carbon price and could be adjusted so as to achieve a desired carbon price trajectory (with the rate being adjusted annually as a Finance Bill measure).

The CCL is in effect a tax on energy users, raising energy prices, though it will provide only a small additional incentive for low carbon investment.

Feed-in tariffs

Feed-in tariffs (FITs) are currently available for small generators (<5MW). The coalition agreement commits the government to their large scale extension, even to nuclear.

Both FITs and the current Renewables Obligation (RO) on suppliers provide a mechanism for the subsidy of low-carbon generation. The RO does this through the premium that renewables generators can

Encouraging flexible generating capacity

To balance our variable energy needs, more flexible generating capacity – most likely gas plant – will be required but will only operate for relatively short periods of time, when peaks in demand coincide with low levels of wind. The necessary plant will be built (or kept out of retirement) if there is a market for capacity or if prices for electricity during peak periods can go so high that they support a speculative investment decision, or if investors can obtain long-term contracts providing the revenues needed for financing.

Large incumbent electricity suppliers could contract for, or invest themselves, in flexible generation if they would otherwise be exposed to very high peak electricity prices or if they are subject to an obligation to procure capacity. The other way of creating a market for capacity is to create a central buyer to procure it.

In Project Discovery, Ofgem left open the question of whether improvements to market pricing mechanisms and liquidity would be sufficient to encourage the necessary investment. DECC's Consultation Paper assumes they will not be. Markets seldom work perfectly.

Instead, through capacity payments, the government proposes transferring some of the risk of capacity shortfalls from market participants to customers. The transfer of risks will inevitably alter the economic calculations of participants in the market. The government will need to design its capacity mechanisms very carefully indeed to avoid weakening those investment incentives.

Risk, the cost of capital and capacity investment

The principal obstacles to low-carbon investment identified by DECC relate to investor wariness of political and policy risk. However, the policy thinking and the modelling relate risk and the cost of capital to market-related, rather than policy-related, revenue uncertainty.

One of the central insights behind the Capital Asset Pricing Model is that investors differentiate between different kinds of risk. The main risk that affects the cost of capital is systematic risk – returns that co-vary with the stock market as a whole. The cost of capital is not simply a function of the level of revenue uncertainty.

However, DECC's modelling adopts a simplistic assumption that the cost of capital is directly related only to revenue volatility. This may have distorted the government's policy choices, dampening important price signals on the one hand while under-estimating the cost of capital for both renewables and flexible generation on the other.

demand for certificates (ROCs) that suppliers need to meet their obligation. The FIT mechanism is a direct price subsidy.

The DECC paper discusses alternative approaches for FITs before settling on its preferred option of a contract for difference (CfD). Under the CfD, there would be a top-up payment calculated as the difference between the yearly **average** market wholesale price and the agreed FIT. It would in theory underpin a minimum level of tariffs for low-carbon generators while leaving them with the incentive to generate when wholesale prices are high.

This is seen as being more attractive than either fixing tariffs with no relation to the market price (thus removing incentives to respond to market prices) or paying a premium to the market price, which leaves revenue uncertainty with the generator. Unfortunately the FIT/CfD proposal, like the RO, leaves balancing risk with the generator.

DECC recognises that introducing a FIT would make the RO redundant in the longer term. It proposes to keep the RO open to new investment until 2017 and then to close it. The RO might eventually

be replaced by a guaranteed indexed price for legacy ROCs.

Our experience, drawn from a comparison of the UK with international practice in a wide range of countries, is that FITs can achieve renewables targets more effectively than an obligation on suppliers and that, in the UK at least, the RO has proven to be more expensive than FITs are likely to be. But over time, unless adapted to changing technology costs and quantities, FITs can become unacceptably expensive – as recent policy changes in countries including Spain and the Netherlands demonstrate. The use of CfDs, while theoretically appealing, also faces significant practical difficulties given that these introduce new complexities, including the lack of any existing market reference price.

DECC has not yet given details on how the government would set FITs. Despite this, DECC reaches detailed conclusions on the impacts of its FIT proposals. We question the reliability of this impact analysis given the lack of detail in the proposals. Is the possible incentive effect of the CfD worth the added complexity?

Emissions performance standard

The proposed emissions performance standard will ensure that new and upgraded coal capacity will effectively only be permitted if it is CCS-capable (carbon capture and storage). There would be limited exceptions to permit demonstration projects where CCS-fitted capacity is less than 100% of the total.

This is relatively uncontroversial in itself; although there is an obvious risk it will raise costs and thereby work against achievement of the affordability objective. As yet, CCS is an unproven technology.

Security of supply

The retirement of existing plant, increasing electricity demand, doubling by 2050, and large-scale expansion of inflexible, intermittent renewables generation means the nature of the investment challenge to keep the lights on is entirely different from the past. The problems start in the near future: 19 GW of existing nuclear, coal, oil and gas plant is scheduled to close by 2020.

Demand for electricity from thermal generators will become considerably more peaky. Expectations of peak energy prices may have to rise to exceptionally high levels to cover the capital costs of low load factor plant. With uncertainty in demand, doubts about market liquidity and a high degree of policy uncertainty, among other investor concerns, DECC thinks that the current market may not be enough. The government thus proposes a targeted capacity mechanism alongside new obligations on Ofgem in the form of a security of supply guarantee. Ofgem will still need to consider reforms to enhance price signals and supplier obligations.

Targeted capacity mechanism

One of the packages considered by Ofgem in its Project Discovery was introducing capacity tenders for all new capacity, although this would face significant EU legal difficulties. DECC is proposing a more limited design of capacity mechanism, where a central body would seek tenders for peak reserve capacity. Dispatch of this capacity would be on a last-resort basis aimed at minimising distortions to the market.

The capacity would come from a mix of old plant that would otherwise have closed and some new OCGT plant, although the option of also using the mechanism to target demand-side response and specific technologies is left open.

This will only work if Government is able to preserve the incentives for efficient capacity investment, most critically by allowing prices to spike very high at times of system stress. Ofgem has begun to address this by its proposals to improve market liquidity³, but this may not be enough on its own.

Maintaining market-driven price signals when there is substantial intervention by a central procurement body will be difficult to reconcile. The very presence of a targeted capacity mechanism will tend to depress peak prices, thus exacerbating the under-investment problem it is intended to address. The crowding out of private investment may develop into a slide down a **slippery slope** with the mechanism being ever expanded, depressing peak prices further, and then being again expanded to plug the resulting capacity gap.

Looking forward

DECC's proposals seek to combine reliance on market price signals with a capacity mechanism and a market in which much capacity is selling under fixed prices (FITs). The risk is that policy uncertainty and the scale of intervention undermine the power of price signals. A more market-oriented capacity mechanism could be made to work. Alternatively, a clear policy priority on making the energy market an effective driver for investment may also work.

Is DECC sitting on the fence? The forthcoming White Paper⁴ will help answer that question, but a fence is a dangerous place to sit. Unresolved policy tensions may eventually lead to a hasty and very expensive expansion of intervention in the procurement of generating capacity in response to failures of price signals, resulting from the Government's own interventions. Is DECC in danger of losing sight of the market?

About ECA

Economic Consulting Associates Ltd is a London based specialised economics consulting firm focused on energy market economics and regulation for industry and government. ECA has many years' experience in carrying out economics-based policy analysis in the UK and worldwide, in particular contributing significantly to market design in several major countries.

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¹ DECC's Consultation Documents can be found at: <http://www.decc.gov.uk/en/content/cms/consultations/emr/emr.aspx>

² The EMR consultation period closed on 10 March; DECC's response is awaited.

³ [http://www.ofgem.gov.uk/Markets/WhlMkts/CompendEff/Documents1/Liquidity Proposals for the GB wholesale electricity market.pdf](http://www.ofgem.gov.uk/Markets/WhlMkts/CompendEff/Documents1/Liquidity%20Proposals%20for%20the%20GB%20wholesale%20electricity%20market.pdf)

⁴ The White Paper is expected to be published in the second half of 2011.