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10 March 2011

RWE UK response to the DECC Electricity Market Reform Consultation

RWE welcomes the opportunity to respond to this consultation. We are responding on behalf of RWE companies operating in the UK:

- RWE npower owns and operates one of the largest and most diverse portfolios of power generating plant in the UK with over 9,000 megawatts (MW) of large gas, coal and oil-fired power stations and cogeneration plant. Our retail arm, npower, is one of the UK's leading suppliers of electricity and gas with around six million customers.
- RWE npower renewables, the UK subsidiary of RWE Innogy, is one of the UK's leading renewable energy developers with an operational portfolio in the UK of 535MW and a potential UK development portfolio of over 8,500MW, including wind farms, hydro plant and biomass generation to produce sustainable electricity.
- RWE Supply & Trading is one of the leading companies in European energy trading and is responsible for all of RWE's activities on the international procurement and wholesale markets for energy.
- Our joint venture with E.ON UK, Horizon Nuclear Power, is developing up to 6GW of carbon free nuclear power.

We welcome the progress that has been made in the EMR consultation in clearly establishing the principles for market reform and setting out the direction of travel. In particular, we welcome the progress made in defining the features of the low carbon revenue support proposals to include:

- Broadening the scope of the low carbon support mechanism to include the full range of low carbon technologies;
- Keeping all generation in the market, retaining the efficiency of dispatch, maintenance and siting;
- Delivering Government objectives efficiently to minimise cost increases for consumers; and
- Bringing new investment into the market.

However there is still significant uncertainty and much now needs to be done to clarify the detail of the proposals. It is crucial that momentum is not lost and Government now needs to turn its attention to the timely delivery of a comprehensive EMR White Paper and associated legislation which is essential for investment needs. We look forward to close engagement over the coming months with the EMR delivery team to work up the necessary detail.

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Efficient markets need to remain at the centre of the EMR

The UK has pioneered competitive and open energy markets and these have served the UK well in terms of timely investment to deliver secure and affordable energy.

Maintaining market integrity and efficiency should be a primary goal of EMR, including ensuring full consideration of interaction of supply with demand side, to ensure that Government objectives are met in the most economically efficient manner possible and at least cost to consumers.

We welcome the commitment in the EMR consultation to retaining the exposure of all generation to the market to ensure the efficient siting, operation and maintenance of plant. It is crucial that this is delivered in the detailed design. Low carbon generation should be fully exposed to the price signals in the traded electricity market to ensure that parties have the incentives to minimise imbalance cash out. However, we note that the proposals to introduce a capacity mechanism, particularly if a broad-based capacity mechanism, could dilute and distort significantly the price signals in the market by remunerating all plant that remains on the system regardless of its characteristics with respect to the flexibility required to balance intermittent low carbon generation.

Focus on the delivery of large scale low carbon generation projects

We support the objective of levelling the playing field to ensure all low carbon technologies can contribute to the delivery of the Government's climate change and energy goals. We welcome the fact that the consultation shifts the debate towards the expansion of low carbon generation more generally and away from support for specific low carbon technologies only.

The primary issue for the EMR to address is to see investment in Round 3 offshore wind projects and the first wave of nuclear as soon as possible, as well as CCS retrofit to demonstration projects in due course. However we do not think it is sensible to try to second guess what the market will look like in 2025 and beyond. The new low carbon support mechanism (whether CfD or PFIT) should make these large scale low carbon investment projects attractive to new sources of finance by providing stable, predictable and transparent rates of return over appropriate payback periods and commensurate to the level of risk.

There is a need to ensure that whichever mechanism is implemented, it is flexible enough to accommodate the needs of both large scale and smaller scale projects, with the design of the mechanism being proportionate to the scale and complexity of the project and the risks and costs associated with different types of projects.

The reforms should be defined so as to provide the minimum set of interventions to allow investment in the first wave of investments to happen, rather than trying to encompass everything at once, which will inevitably result in unforeseen outcomes. We have concerns regarding certain elements of the package and its coherence in this regard.

Early clarification of transitional arrangements is crucial

We welcome Government's reaffirmation of its commitment to no retrospective changes to the established rights under which investment commitments have been made. This is crucial to maintain investor confidence in the UK market and to ensure that the transitional arrangements do not stifle current development or delay investment decisions.

To maintain confidence in the UK market, it is important that rights established for investment made under the RO are retained. Government are proposing certain grandfathering arrangements, which are

welcome. However, it is critical that Government provides clarification of the detail of the grandfathering provision and the future operation of the RO within the EMR White Paper, explicitly stating that grandfathering covers all the constituent elements of the current RO scheme on which investments were based (i.e. the index linked buyout price retained at current levels, the ROC multiples and the basis on which ROC values will be calculated).

We have particular concerns regarding the transitional arrangements accommodating the lead time for offshore wind. We welcome the proposed parallel running of the RO and the new low carbon support mechanism. However, the four year overlap is insufficient, leaving projects with long lead times, in particular offshore wind, in a position where they are too late to take the full benefit of the RO, but too early to have full understanding of the detail of the FiT. The most straightforward means of addressing this would be to extend the period of parallel running (i.e. extending the RO to 2020 and the RO support to 2040).

Carbon price support will not deliver new large scale low carbon investment

Carbon price support does not provide the necessary certainty for investment in new low carbon generation due to the diminishing benefits of carbon pass through as the sector decarbonises.

The EU has set emissions reduction targets through the EU ETS and this should remain the central mechanism for determining carbon prices. Introduction of a carbon price support mechanism over and above the EU ETS will materially impact on the price of UK electricity. This could have significant impact on prices for UK consumers and prices (and so competitiveness) for UK industry relative to other EU countries. It could also result in a greater level of input from overseas of power and remove any export possibilities for the UK. It could also lead to significant windfalls to existing low carbon generators (particularly existing nuclear power stations). To minimise these impacts, the tax should be set at a nominal rate to 2018 only impacting once new large scale low carbon investment comes on stream.

We are concerned that the rate of the proposed tax could be decoupled from the EU carbon allowance (EUA) price resulting in an undue impact on UK competitiveness particularly if, for example, the Commission strengthens the EU ETS or the EU moves to a 30% emissions reduction target. The method of setting the tax needs to be through a clear link to the EU ETS allowance price.

The level of the carbon price support needs to be visible when we sell future generation capability into the wholesale market. To avoid impacts on market liquidity, the tax rate should be set annually for a moving 4-year window, providing advance visibility. To this end, the carbon price support mechanism should not come into effect (even at a nominal rate) before 2015 at the earliest.

As it is a tax, it will not provide the certainty required for new investment. It will, however, increase political and regulatory uncertainty and so could curtail investment by users of energy in the UK who will be concerned at the risk of increases in the rate of the carbon tax affecting the economic returns and competitiveness of their UK business.

The case for considering a capacity mechanism as part of the EMR has not been made

The case for contemplating the introduction of a capacity mechanism at this stage has not been made and this should not therefore be a priority issue for the EMR White Paper. We have set out in our detailed consultation response why a capacity mechanism is not required and provide evidence to back this up.

Such an intervention in the market now will undermine the capability of the market to deliver an efficient combination of generation capacity and demand response at lowest cost to consumers. It simply is not

possible to define the future energy mix or response capability at the point at which a problem might arise, so any proposed solution will necessarily be speculative and more than likely inadequate or wrong.

The EMR consultation downplays the cost to the consumer of intervention in the capacity market. Experience around the world suggests that capacity mechanisms have a number of undesirable effects on the economic and efficient operation of electricity markets i.e. they undermine price signals, impact on the efficient development of demand-side response and forestall the innovative development of market-based solutions such as storage, interconnection and energy efficiency. Furthermore, there is no guarantee even with a capacity mechanism that overall security of supply will be enhanced if the subsidised capacity is of the wrong type, or in the wrong place. Our detailed response to the consultation provides evidence from other capacity mechanisms in other jurisdictions to underscore these points.

Price signals play a critical role in the successful deployment of smart metering and the participation of the demand side in the electricity trading arrangements. Any intervention that dilutes or impacts on the price signals such as a capacity mechanism will threaten the success of this policy area, which could play an increasingly important role in balancing the system going forward.

There are known issues with the present cash out arrangements that require review in the context of a consideration of capacity requirements and associated incentives. The present cash out arrangements could be improved to make them more cost reflective of some of the actions that National Grid take to balance the system. Examples of these are the methodology used to price the reserve contracts and the lack of any pricing signal when demand control is instructed. Correctly pricing these actions would produce cash out prices that would provide signals to parties to balance the system either by increasing supply or reducing demand.

Successful resolution of these issues will not only provide signals in the short term but will feed into future investment decisions on capacity and delivery of demand-side initiatives such a smart metering and associated tariffs, without the unintended and adverse effects of a capacity mechanism.

If concerns remain about the capacity margin, Government should seek to refine and build on the existing reserve market (the Short Term Operating Reserve), with adjusted cash out prices, rather than introducing a new mechanism. If designed carefully, such incremental STOR procurement to provide a pre-defined level of additional capacity could have a minimal impact on the market.

Emissions Performance Standards

The proposal for an EPS duplicates existing Government policy for new coal plant and is unlikely to provide any additional certainty or incentive for investors in low carbon generation. The introduction of an EPS opens up the risk of further intervention and may discourage investment in the new CCGT plant which will be needed to maintain security of supply during the transition to a low carbon economy.

We are pleased that Government has recognised and attempted to ameliorate this risk. The principles of no retrospective introduction of an EPS for existing plant and grandfathering of the EPS level for new investments will be crucial to maintaining confidence in the UK as a place to invest and should be enshrined in primary legislation.

We need clarity on circumstances under which existing plant will be subject to an EPS in the event of significant life extension or upgrade. However, the EPS requirements must not undermine the ability of plant to invest in the upgrades necessary to facilitate plant changing its role over its lifetime to meet potential gaps in the market (i.e. for flexible back up plant) at a relatively lower cost than replacement new plant. An EPS should thus apply for the full plant life and not be triggered by a significant life extension or upgrade, unless it is demonstrable that any revised standard can be met through best

available techniques as set at the European level (akin to the BAT Reference Review process for setting emission limit values).

Low carbon support mechanism

We welcome the proposals to support the full range of low carbon generation technologies as part of a package of measures designed to meet the Government's targets for decarbonisation. This will allow government objectives and targets to be met more cost effectively.

The priority is the need for a mechanism to underpin large scale low carbon investment to ensure Round 3 wind, the first wave of new nuclear and CCS retrofit of demonstration projects and deliver stable and predictable returns commensurate with risk.

We believe a 'Low Carbon Obligation' based on the ROC approach would have been the simplest way of achieving this with minimum disruption to the delivery of investments and the market. The Government has decided against this approach seeing greater potential merit in a more targeted revenue support mechanism. This should be designed to deliver more certain returns to attract capital from new investors who are not used to taking electricity market price risk. The scale of the investment required in the UK by 2025, higher than the other EU countries, means that one crucial measure of the effect of the EMR will be its success in attracting new investment.

A contractual revenue support mechanism is best suited to satisfying the requirement of investors for stable, predictable and transparent returns commensurate with risk, independent of whether a CfD, PFiT or variant is chosen. Both a CfD and a contractual PFiT could be designed to deliver investment in large scale low carbon generation. As currently framed in the consultation, however, the CfD appears to most closely offer the regulatory certainty that investors are seeking subject to resolving some of the complex issues associated with implementing this approach (such as defining the strike and indexed power price, the level of support and contract duration).

Government has focused on the cost of capital as a reason for preferring CfD, believing this will be attractive to investors and reduce costs to the consumer, compared with a PFiT which fits better with the market. However, the cost of capital will be fundamentally dependent on how risks are shared between developers and government and we believe that some form of contractual framework will be needed to allocate risk, independent of whether a CfD, PFiT or variant is chosen.

For portfolio generators, exposure of their low carbon generation portfolio to the carbon price provides an important hedge against the impact of rising carbon prices on their fossil generation portfolio and is a significant consideration in any low carbon investment decision. A two-way CfD, as proposed in the consultation, would remove exposure to the carbon price and Government needs consider the implications for investment in low carbon generation.

Government should not underestimate the complexities of any contractual relationship to deliver low carbon. It is critical that the key delivery elements of the Government's proposals are defined as soon as practicable (such as the cost recovery mechanism and defining the contractual counterparty).

Auctions are not feasible for Round 3 projects and the first wave of new nuclear

In theory, auctions can work well where there are a significant number of credible bidders, the requirements are well specified and understood by the bidders and the costs known.

Round 3 offshore wind and new nuclear projects do not meet these criteria and hence we do not believe that an auction would be a feasible mechanism for setting the level of support for these projects.

- Nuclear and Round 3 sites have already been auctioned and awarded, reducing the number of credible participants in any subsequent allocation process. Another auction will increase uncertainty, stifle early stage development and introduce delay in delivery of these projects.
- With limited experience of delivering such complex technical projects in the UK, there is incomplete information about the costs of deploying these projects. An auction process introduces the prospect that the least realistic bidder might win low carbon support, which in turn could lead to the non-delivery of projects (the 'winners curse' as demonstrated by the NFFO auctions, where only 30% of projects were built).
- Being in a position to bid is itself very costly. With a high level of risks and uncertainties surrounding Round 3 offshore wind projects and the first wave of new nuclear, developers will need to go some way down the development cycle before they can bid into an auction. Too few credible participants mean that the auction would not deliver a competitive price.

For these reasons an administered process involving appropriate contractual arrangements and structures will be the only way of satisfying investor requirements, while seeking to ensure projects deliver value for money.

Treatment of Combined Heat and Power (CHP)

The proposals in the EMR threaten to undermine both existing and future investment in new high efficiency gas CHP unless emissions associated with heat production are removed from the calculations for both the carbon tax and the EPS levels.

Treatment of biomass

The treatment of biomass emissions under the proposed EPS should be consistent with the EU ETS monitoring, reporting and verification guidelines, which currently zero-rates emissions from biomass fuel when calculating plant carbon-dioxide emissions.

EMR must avoid unintended consequences on company balance sheets

Any market reform must take care not to unduly increase the liabilities on utility balance sheets which would result in reduced capital for investment and raising of investment hurdle rates. This would extend to any guarantee requirements placed on a CfD as this would utilise capacity within corporate credit headroom for credit rating evaluation purposes. Consequently, reducing the level of capital that could be raised, resulting in a longer lead time to deliver the low carbon generation required to meet Government's targets.

The way forward

The issues raised by the consultation are many and complex, as well as highly interactive. To maintain progress and avoid a hiatus in investment, the EMR White Paper needs to focus on a minimum set of interventions which will deliver the required investment and at lowest cost to the consumer.

A sense of urgency is required in terms of need for action and timely outcome to the EMR. We need clarity this year and detail by the end of 2012. We are concerned about reports that the White paper has slipped from May to July this year and could be delayed to Autumn. Furthermore, the legislative timetable has now slipped to May 2012 for the introduction of the Bill.

The Government's rejection of extending the ROC mechanism to all low carbon generation will itself result in a delay in the clarity and certainty of the mechanism that investors require. We are also concerned about potential scope creep of the EMR to include network issues and liquidity. These are being considered elsewhere and would add further to the complexity of the market reforms and could undermine progress. We also believe that there is the potential for unintended outcomes.

We look forward to working with Government on the detail of the proposals to deliver an EMR White Paper which is sufficiently comprehensive and detailed in its thinking to lead to a decision. Focusing on delivering an appropriate minimum set of interventions, together with parallel tracking of the legislation and the setting up of the institutional arrangements and implementation detail, will be necessary if Government is to make timely progress to facilitate early investment in either Round 3 wind or first wave new nuclear projects.

Yours sincerely,

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RWE UK response to detailed EMR questions

1. Do you agree with the Government's assessment of the ability of the current market to support the investment in low-carbon generation needed to meet environmental targets?

It is worth noting that the present market arrangements have delivered on security of supply, low prices and reducing emissions as described on page 22 of the consultation document and in particular:

- delivered the almost 30GW of gas generation currently in operation and maintained an adequate capacity margin;
- resulted in electricity prices which have been comparatively low and fairly responsive to movements in fuel costs;
- supported the deployment of increasing amounts of renewables from 3.1GW in 2002 to 8GW in 2009; and
- reduced greenhouse gas emissions by more than 25% compared to 1990 levels.

The existing arrangements have already evolved to meet challenges along the way and there is a very strong case for a minimalist approach to reform which would address the issues relating to high capital cost, low carbon generation (i.e. offshore wind and nuclear), and leave the rest of the market arrangements as they are today.

For example, the current renewables support mechanism is fully compatible with the existing trading arrangements. We believe a further evolution of the RO into a 'Low Carbon Obligation' could have helped to move the UK towards its decarbonisation objectives with minimum disruption to the delivery of investments and the market. The Government has decided against this approach seeing greater potential merit in a more targeted revenue support mechanism to attract new investors.

We recognise that the scale of the investment challenge facing the energy sector is huge. Significant capital investment in new electricity generation capacity will be required over the next two decades to deliver the Government's decarbonisation and renewable energy aspirations. The EMR estimates a capital requirement of £70-75 billion in low carbon generation by 2020 alone, and high rates of capital investment in generation infrastructure will need to be sustained into the 2020s.

The scale of investment required to deliver the Government's low carbon ambitions is indeed difficult, if not impossible, to fund from utility balance sheets alone. UK Government is keen to make investment in low carbon attractive to a wider range of investors to address this restriction.

Ensuring the right market structure is the crucial first step in delivering future investment. To make the investment more attractive to new investors, who are not used to taking electricity market price risk, there are two key issues:

- that the returns are stable and predictable and commensurate with the risks that are being taken, and
- that the investment can be compared to other opportunities investors have to deploy similar amounts of capital in large infrastructure investments.

In this context, a contractual revenue support mechanism is most likely to satisfy the requirement of investors and lenders for firm returns from the low carbon support mechanism, that are protected from regulatory risk, independent of whether a CfD, PFIT or variant is chosen.

Another key element to investor confidence will be the track record of the first few projects in being delivered on time and to budget. As confidence grows in low carbon investment a greater range of investors is likely to be attracted.

However, it is unclear whether these investors will be keen to take construction risk as well and so such investors may delay their participation until post construction refinancing. Therefore other sources of finance may be required during construction. One such source would be the Green Investment Bank if it was able to invest alongside project developers during construction on a like for like 'pari passu' basis.

2. Do you agree with the Government's assessment of the future risks to the UK's security of electricity supplies?

As noted above, existing market arrangements have delivered on security of supply and just as importantly they have had to evolve to meet new challenges along the way. Some argue that the scale and pace of change now required is such that the present market arrangements cannot deliver security of supply in the future. We go on to argue that this is not the case, there is no reason that the present arrangements cannot evolve to deliver government objectives in the future.

In relation to the particular question of security of supply, the case for the consideration of any form of capacity mechanism as part of EMR has not been made. Other than the proposed Significant Code Review (of cash out methodology) we do not consider any further intervention to be required. We have the following comments on the discussion in the consultation document.

The peak wholesale electricity price may not rise high enough (low peak prices) – it is widely known that there were a number of compromises in the design of the present cash out arrangements. Ofgem has signalled its intention to carry out a significant code review into the present cash out arrangements. This review is the place reforms should be assessed to ensure that the correct market signals for capacity are provided. When these issues are resolved, the GB trading arrangements will give robust incentives on companies to remain in balance with the reserves maintained by National Grid then providing a sufficient safety net for unexpected variations within settlement periods. As wind penetration increases, market prices will provide the incentive for investment in further flexible generation which will be able to benefit from the changing profile of hourly prices.

We do not accept the arguments, made by some, that occasional incidences of price spikes in the balancing market are unacceptable. Indeed, we believe it is an important part of delivering an efficient level of capacity and demand response. The NETA/BETTA market has already been working for 10 years and numerous price spike incidents have occurred during this time without a requirement for intervention. In fact most of the political scrutiny of price levels is around the *average* level of customers' bills rather than prices in the balancing mechanism in particular half-hourly periods. In general, commentators and observers of the industry and the media recognise the difference between balancing prices (which end-users do not see) and consumers' bills. Likewise most well-informed industry experts recognise that adopting policies that suppress normal price signals will result in higher overall bills since capacity would be delivered through an administrative process that is inefficient (as demonstrated in the pre-NETA market).

Management of peak price uncertainty – The current market arrangements allow for efficient hedging of peak price volatility and encourage efficient investment. However, forward prices are only one of the signals that investors model when making investment decisions. Investors also model the potential 'extrinsic' value that results from investing in plant flexibility (including the rents that can be obtained from providing services to National Grid in the balancing system). Strategic considerations, such as the way a

company wishes to position itself in retail markets, are also important. Finally the risk appetite of the companies and their balance sheet structures will affect decision making.

We would observe that the inherent uncertainties in the sector have not deterred investment so far in CCGT's and upgrading of existing plant that ensures it can provide the flexibility that the system requires. If anything, higher penetration of renewables makes the returns from investment in flexible generation less uncertain, since flexible capacity will be needed more frequently.

Policy Uncertainty – There is no doubt that EMR introduces a significant degree of policy uncertainty. However, it is for the government to determine energy policy and decide on EMR as soon as possible. The overall direction of policy with respect to renewable penetration and decarbonisation has been clear since the 2020 renewables and 2050 decarbonisation targets were adopted. A commitment to some 10GW of new capacity has been made in this context. As far as RWE investments are concerned, the increasing need for flexible operation from 2015 onwards has been explicitly taken into account in plant specifications.

Investment cycles in generating capacity – There has been a steady flow of investment in new generation over the last decade with more due on stream in the next few years. This suggests that investors take a more considered view of a package of investment signals than the consultation suggests and take a relatively long term strategic approach.

Low levels of liquidity in electricity wholesale markets - We support the work of Ofgem in considering the issue of liquidity under the current market design. However, we do not believe the case for radical change has been made. We are working hard to improve liquidity in the electricity market by supporting developments such as the N2EX exchange, which are now established in the GB power market. Traded volumes have grown consistently since May 2010. In November 2010, N2EX announced that the day ahead auction would form the index for a series of cleared financial contracts on UK power and these are now appearing on the NASDAQ system. N2EX also recently launched an OTC spot market for companies who don't have the appetite to clear through the auction. We believe that, in time, financial contracts will attract new entrants to trading forward power, and will increase spot/auction volumes as financial hedges are converted to physical. Increased interconnection with the Netherlands (recently) and with Ireland (next year) will also increase the linkage of the UK market to neighbouring markets and increase the number of market participants and traded volumes. We are pleased that Ofgem has recognised that the industry is making efforts to improve liquidity and expect that the spring review will confirm that progress is being made.

We believe that the market modelling by Redpoint on behalf of DECC for the EMR has a number of shortcomings which means that investment is underestimated. In particular it does not appear to correctly capture the following factors affecting price determination and consequently investment decisions:

- allocation of the costs of 'unit commitment' (i.e. start costs) in bidding behaviour,
- incorporation of the opportunity costs of companies offering into day-ahead markets (i.e. the forgone possibilities to offer the plant into intraday, balancing and reserve markets),
- the option value of highly flexible plant (this will be increased by improving price signals in balancing markets and renewable penetration),
- strategic behaviour by companies in formulating their investment strategies and the feedback effect on the size and efficiency of retail supply businesses,
- future possibilities for companies to reduce fixed costs on existing stations through the application of new technology or different working practices,
- the role that planned (eg, Britned and Eastwest) and new interconnection could play in increasing system resilience and reserve capacity, and

- developments of new technologies and practices which lead to the increased impact of demand side participation.

We, therefore, believe that current market arrangements are the best way of ameliorating security of supply risks.

Feed-in Tariffs

- 3. Do you agree with the Government's assessment of the pros and cons of each of the models of feed-in tariff (FIT)?**
- 4. Do you agree with the Government's preferred policy of introducing a contract for difference based feed-in tariff (FIT with CfD)?**
- 5. What do you see as the advantages and disadvantages of transferring different risks from the generator or the supplier to the Government? In particular, what are the implications of removing the (long-term) electricity price risk from generators under the CfD model?**

We have answered questions 3, 4 and 5 together in the following sections.

We welcome proposals to support low carbon generation

In the EMR consultation document, the Government has set an implicit target to 'decarbonise' the electricity industry by 2030. This requires the rate of investment in low carbon generation to increase significantly over the next two decades. As noted in Question 1 above, the scale of investment required will be difficult to fund from utility balance sheets alone. Consequently, we believe that support for low carbon will be important to attract the new sources of finance needed to deliver investment in the large scale low carbon generation projects in the period to 2025 (limited to Round 3 offshore wind, the first wave of new nuclear and CCS retrofit to demonstration projects).

Efficient wholesale markets

The UK has pioneered competitive and open energy markets and these have served the UK well in terms of timely investment to deliver secure and affordable energy. The current market design has served the UK well in the last 20 years bringing forward significant investment in renewables, biomass, CCGT, flue gas desulphurisation and peaking plant.

Maintaining market integrity and efficiency should be a primary goal of EMR, including ensuring full consideration of interaction of supply with demand side, to ensure that government's objectives are met in the most economically efficient manner possible and at least cost to consumers.

Specific measures to support investment in Round 3 offshore wind projects and the first wave of new nuclear and attract new sources of finance

The most efficient mechanism to deliver the investment in low carbon generation required to meet the UK Government's decarbonisation targets would be a clear market price signal from the EU ETS. However for various reasons this carbon price signal has yet to be delivered.

We support the objective of levelling the playing field to ensure all low carbon technologies can contribute to the delivery of Government's climate change and energy goals. However, we believe that the primary issue for the EMR to address is to see investment in Round 3 offshore wind projects and the first wave of nuclear as soon as possible. We do not think it is sensible to try to second guess what the

market will look like in 2025 and beyond and so the market interventions should focus on making these large scale low carbon investment projects (limited to Round 3 wind, 1st wave of new nuclear and CCS retrofit to demonstration projects) attractive to new investors.

The reforms also need to make investment in the first wave of low carbon generation attractive to new sources of finance as utility balance sheets alone are unable to deliver this level of investment in the period to 2025. This may mean the revenue support mechanism will need to go beyond that which utilities require. In particular greater revenue and regulatory certainty may be required by investors and lenders less comfortable with long term electricity market price risk. This will be particularly necessary until the first wave of projects are proven in commercial operation and refinancing can take place to release finance from investors willing to take development and construction risk for the next wave of projects.

A contractual revenue support mechanism is best suited to satisfying the requirement of investors for stable, predictable and transparent returns commensurate with risk, independent of whether a CfD, PFiT or variant is chosen. Both a CfD and a contractual PFiT could be designed to deliver investment in large scale low carbon generation. As currently framed in the consultation however, a CfD appears to most closely offer the regulatory certainty our investors are seeking and may be able to access new sources of finance.

The Government has focused on the cost of capital as a reason for preferring CfD, believing this will be attractive to investors and reduce costs to the consumer, compared with a PFiT which fits better with the market. However, the cost of capital will be fundamentally dependent on how risks are shared between developers and government and some form of contractual relationship will be needed to allocate risk independent of whether a CfD or PFiT is chosen.

We would note that for portfolio generators such as RWE, exposure of their low carbon generation portfolio to the carbon price provides an important hedge against the impact of rising carbon prices on its fossil generation portfolio and is a significant consideration in any low carbon investment decision. A two-way CfD, as proposed in the consultation, would remove exposure to the carbon price and hence this carbon hedge investment incentive. Investors are likely to require a higher rate of return on projects as a consequence.

It is important to remember that Round 3 wind and nuclear projects are capital intensive projects with a longer period between investment decision and first revenue generation. For example, a nuclear project may cost around £10bn and take 7 years from investment decision to commissioning of the first unit. This means developers will have invested an average of £5bn for 7 years before starting to see any return. Developers would be expected to be rewarded appropriately for deploying scarce capital in this way versus other investment opportunities (such as CCGT) which provide a much quicker return on investment.

Government should not underestimate the complexities of any contractual framework to deliver low carbon, which depending on whether a CfD or PFiT is chosen will have to address issues such as contract duration, level and stability of strike price and indexed power price, definition of fixed and capital costs earning streams required to set the strike price, process for setting the strike price, performance criteria, arrangements for ensuring project delivery, arrangements for protection from regulatory risks during construction and operation, project stages and changes to contract parameters and the recovery of costs associated with administration and support.

The robustness of the CfD or PFiT contracts over the duration they could reasonably be expected to extend will be key to investor confidence – the contracts will need to be in place before investment

decisions, through 8-9 years of construction until all units at a site are commissioned and then for at least the first 20 years of operation.

With regard to the CfD mechanism, the methodology by which the reference price is set would need to be very carefully considered. We believe it is impractical to set technology specific index power prices and the utilisation of a market price should be considered. The technology specific risks, including generation profile, should then be included in the setting of the strike price. The design equally needs to evaluate the duration of the index price setting period and whether the price is to be set on a forward price or post delivery model.

The design of the institutional arrangements to implement the EMR will require careful consideration by Government once the likely package of reforms has been determined in the White Paper. However, there are a number of key principles which need to be considered in the design of the arrangements:

- the reforms should be implemented by a single body within government to ensure they are implemented in a joined up manner avoiding any unintended consequences;
- the counterparty to any new low carbon support mechanism contracts needs to be credit worthy (supported by a government guarantee);
- the organisation will need to have a clear remit and autonomy from DECC and Treasury to be able to enter into a CfD or PFiT contract with developers in a timely manner; and
- the organisation will need to be appropriately resourced for the magnitude and commercial complexity of the contracts it will be negotiating, including specific project financing expertise to ensure that the resulting contracts are bankable.

We have provided comments in response to Question 7 regarding the relative level of returns and factors influencing these rates. We remain concerned that this consultation and reviews into market liquidity may have unintended consequences on balance sheets of the utilities, namely increasing liabilities which result in reduced capital for inward investment and raising of hurdle rates. This would extend to any guarantee requirements placed on a CfD as this would utilise capacity within corporate credit headroom for credit rating evaluation purposes. Consequently reducing the level of capital that could be raised, resulting in a longer lead time to deliver the low carbon generation required to meet generation targets.

The low carbon support mechanism should build on the achievements of the RO

We have previously supported a development of the Renewables Obligation into a 'Low Carbon Obligation' since this support mechanism is well understood and helped to support investment. The Government believes that an RO or LCO approach has issues associated with economic efficiency and affordability which would be further aggravated by a carbon floor. Consequently, it is currently proposing that the RO be phased out to over a period to 2017.

The continuation of the RO through a transition period is both welcomed and essential to enable continued investment. However, the proposed arrangements will be insufficient to facilitate investment in offshore wind in the medium term. We believe there is a strong case for extending the period of parallel running of the RO from 2017 to 2020 and the RO support until 2040. If this is not possible, then alternative mitigation measures are required to limit any hiatus and damage to the supply chain (see Question 36).

It is important that rights established for investment made under the RO are maintained. Government are proposing certain grandfathering arrangements, which are welcome but these need to be defined in detail. Investment decisions were based upon the RO as a market mechanism with a recycle element and Government must explicitly state that grandfathering covers all the constituent elements of the

current RO scheme (i.e. the index linked buyout price retained at the current level, headroom, recycling and the ROC band).

The low carbon support mechanism should be compatible with other initiatives and facilitate the normal operation of the traded electricity market

We believe that the low carbon support mechanism should enable the traded electricity market established under the NETA and BETTA arrangements to be maintained as far as possible.

Both the CFD and PFIT models would retain a level of exposure to the power price and its associated volatility, and should encourage low carbon projects to trade in the electricity market (though the incentive properties of the proposals differ).

It is also important that the low carbon support mechanism is compatible with other initiatives such as the carbon price support mechanism which will have a significant impact on power prices.

6. What are the efficient operational decisions that the price signal incentivises? How important are these for the market to function properly? How would they be affected by the proposed policy?

We believe that low carbon generation should be fully exposed to the price signals available in the traded electricity market. This serves two purposes: first, it enables parties to hedge efficiently to minimise risk; and second, it ensures that parties have the incentives to balance output through exposure to the cash out prices derived from the balancing mechanism.

Under the current ROC scheme, the revenue maximising strategy is to forecast output as accurately as possible, to sell firm output in the forward market as efficiently as possible and to minimise exposure to imbalance cash out. These outcomes result in the lowest cost for the system operator in managing low carbon output and are economic and efficient for the market as a whole. The proposed low carbon support mechanisms may have a significant effect in diluting or distorting the price signal.

Price signals are also important to ensure back up generation is available. All of the low carbon support mechanisms (ROC, PFIT and CFD) have the effect of displacing fossil-fuelled power stations in the merit order. Over time this will result in a greater divergence between low power price periods and high power price periods, which is an inevitable outcome of the policy intervention to support low carbon generation. The key issue is the extent to which the required backup fossil generation can recover fixed and capital costs in the high power price (no wind) periods. This will require efficient price signals, which should not be undermined by other subsidies or artificial interventions or restrictions on the resulting prices.

Efficient price signals will encourage demand side participation and deliver efficient hedging of high priced periods by the market (essentially buying forwards predictable generation), efficient market entry (for example by mid merit capacity) and efficient exit. It will also ensure that the costs of balancing the system are optimised by the market. In addition, the price signals will ensure that capacity is maintained on the system without the need for any additional capacity support. We note that capacity support, particularly a broad-based capacity mechanism, could dilute and distort significantly the price signals in the market by remunerating all plant that remains on the system (available) regardless of its characteristics with respect to required flexibility.

7. Do you agree with the Government's assessment of the impact of the different models of FITs on the cost of capital for low-carbon generators?

We believe that the Government's evaluation of the cost of capital for low carbon generators has a number of headline errors in the evaluation of the technology status, namely that onshore wind should be 'Established' not 'Emerging' and all offshore wind should be classified as 'Emerging' not 'Mature'. These evaluation points combined with other factors result in a substantial challenge to the hurdle rates and perceived discount rates relative to the baseline.

Discount rates and any relative increase or decrease to the baseline needs to take account of wider economic factors and investors risk appetite associated with these factors, which include:

- the length of time capital is locked in during the high risk construction and early generation phases,
- the level of absolute investment required for the transition to a low carbon generation mix,
- the finite amount of and competition for these sources of capital,
- the effect the transition has itself on the wholesale power price over the longer term, and
- the level of absolute exposure equity and debt providers are prepared to take in the electricity sector at these rates.

We believe that a Premium FiT is likely to increase rather than maintain the hurdle rate on the assumption that there is increased long term volatility in power price from increased or earlier penetration of large scale wind. Appropriate hurdle rates for a CfD will be dependent on capital availability factors, the contractual structure, and the appropriate sharing of risk especially in the construction and early generation phase, and finally on the credit rating of the CfD counterparty.

8. What impact do you think the different models of FITs will have on the availability of finance for low-carbon electricity generation investments from both new investors and the existing investor base?

Please see our comments above.

9. What impact do you think the different models of FITs will have on different types of generators (e.g. vertically integrated utilities, existing independent gas, wind or biomass generators and new entrant generators)? How would the different models impact on contract negotiations/relationships with electricity suppliers?

There are divergent opinions across the industry regarding the relative merits of the two proposed models, which is apparent from the views expressed in the trade association responses. This is reflective of how the models impact on different types of market player, technologies and scale of project.

For Government to achieve its carbon reduction objectives, it is essential that the model adopted is attractive to the widest range of investors and effectively supports all low carbon generation. This is unlikely to be achieved via a one size fits all policy. This has already been recognised by Government with the introduction of a full FiT tariff for micro-renewables, to protect small scale investors from market risks and transactional costs.

Ideally, the new low carbon support mechanism (whether CfD or PFIT) should be designed to specifically make large scale and first-of-a-kind low carbon investment projects (i.e. Round 3 offshore wind, the first wave of new nuclear and CCS retrofit to demonstration projects) attractive to new investors.

However, there is a need to ensure that whichever mechanism is implemented, it is flexible enough to accommodate the needs of both large scale and smaller scale projects, with the design of the mechanism being proportionate to the scale and complexity of the project and the risks and costs associated with different types of projects.

10. How important do you think greater liquidity in the wholesale market is to the effective operation of the FIT with CfD model? What reference price or index should be used?

Both the premium FIT and the CfD models expose parties to the power price to some extent. Consequently there is an incentive on parties to ensure that revenue can be maximised by efficient energy forward sales (hedging) and efficient management of imbalance. These incentives to trade efficiently will further help drive increased liquidity in general.

Under the FIT proposal, the incentive on parties to trade forward will depend on the level of the premium and its duration. If the premium is set at a high level, parties will receive the majority of remuneration through the subsidy mechanism, and the incentive to trade forwards will be reduced.

Under the CfD model, the incentive to trade is established through exposure to the indexed power price. Of course the key question is how the power price is established, maintained and managed. If the index is set ex ante then parties have an incentive to match or beat the power price. However, there are a number of questions that require resolution, including the way the index is set, its stability over time and the period in which it is applied. Some weighted average of the day-ahead market price could be suitable. This would allow a reasonable balance between incentives to optimise production and the certainty that investors need.

Clearly in terms of establishing a robust power price index, there must be sufficient assurance that the power price is economic and efficient. This will require confidence that there is a sufficient volume of trades that underpin the price index. This in turn will require confidence that the index is not capable of price manipulation.

In essence the index represents the efficient level of forward trade achieved by parties in the market place. The only index that can perform this function is, potentially, the day ahead-price obtained through the power exchanges or the market index price established ex post in the cash out mechanism (which represents the short term cost of energy trades) or some form of power price index derived from a power exchange (such as the monthly N2EX price). The appropriate index may differ for different technologies.

Establishing the power index arrangements is critical to the efficient hedging strategy of parties under a CfD. Price setting for the index power price is not achievable on a technology specific basis, meaning that the strike price set within the CfD will need to reflect the project specific criteria considered for the largest and first-of-a-kind schemes. This should reflect not only the cost bases but also form a representation of the achievable wholesale prices for that technology and/or project, as each project represents a large investment with individual project characteristics.

11. Should the FIT be paid on availability or output?

It is imperative that the FIT or CfD is paid on output rather than availability. This will ensure that parties develop the sites that are most likely to deliver the Government's decarbonisation targets by optimising the delivered output to the market.

We would be extremely concerned if FITs or CfDs were paid on availability. We believe that such an arrangement would result in the development of projects at sites where the renewable resource is suboptimal in order to maximise rents through the availability payments.

Emissions Performance Standards

12. Do you agree with the Government's assessment of the impact of an emission performance standard on the decarbonisation of the electricity sector and on security of supply risk?

The proposal for an Emissions Performance Standard (EPS) is unlikely to provide any additional certainty for investors in low carbon generation. We note that the proposed EPS aims to provide a 'regulatory backstop' to prevent new coal-fired generation being built without installation of carbon capture and storage. However, in practice the EPS duplicates existing Government policy for new coal-fired power generation. The consultation itself notes that the proposed EPS has limited interaction with the other mechanisms. It is difficult to see how the EPS will provide any additional certainty or incentive in delivering the investment needed to achieve climate change goals.

We concur with government's conclusions on the security of supply implications of introducing an EPS and recognise that the proposal has attempted to ameliorate these risks through e.g. grandfathering at consent and setting the EPS as an annual limit.

13. Which option do you consider most appropriate for the level of the EPS? What considerations should the Government take into account in designing derogations for projects forming part of the UK or EU demonstration programme?

Setting an EPS for a coal fired power station (or mandating for CCS through the consenting process) before CCS is technically and commercially proven and the technology has been demonstrated, is premature.

While CCS technology is a potential for future low carbon generation of electricity the full chain has not yet been demonstrated and is not likely to be commercially viable for a number of years. It is far from clear what warranties on performance standards vendors will be able to offer and how these might impact on the cost of CCS.

The operating pattern of a generation unit fitted with CCS is very difficult to predict at the demonstration stage. Hence, it is very difficult to set a meaningful EPS until it is clear that the unit with CCS fitted is fully operational and meeting CO₂ removal efficiencies.

While setting the EPS as an annual limit may be seen to ameliorate these performance risks to some degree, the introduction of an EPS does nothing to improve the bankability of investing in new coal-fired plant. A more considered policy with Government, for example, underwriting some of the risk if CCS were not feasible technically or economically, would be more likely to encourage the UK to develop CCS expertise.

If an EPS is to be introduced, it should be set as an annual limit and at a level consistent with existing coal policy (600g/KWh) to avoid further undermining the case for investment in CCS demonstration.

However, even at this level, the EPS could further deter investment in new high efficient gas CHP, unless emissions associated with heat production are removed from the EPS levels.

In contrast to CCGT, where the incentive is to maximise the electrical efficiency of the plant, with CHP the aim is to maximise the overall efficiency (electricity and heat) of the plant. Good Quality CHP is defined under EU legislation as upward of 75% electrical + heat efficient (compared with 59% electrical efficiency of a new CCGT plant). However, the electrical efficiency of a Good Quality CHP plant is driven by how much heat load there is and is extremely variable (from 16-30%). Currently the incentive – rightly