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Dear Sir or Madam

Electricity Market Reform: Vattenfall response

The UK Government has proposed to make significant changes to the way electricity markets function in the UK. Its proposals are intended to encourage investment in low carbon generation and peak load plant and so achieve domestic renewable energy objectives and ambitious climate change obligations whilst delivering affordable and reliable power supplies.

Vattenfall supplies electricity, heat and gas to millions of customers across Northern Europe. It is the fifth largest generator of electricity and largest producer of heat in Europe. It has a wide generation portfolio which includes hydro, wind, biomass, coal (including carbon capture and storage), gas and nuclear.

Vattenfall generally believes that action on affordability, reliability and climate change in the electricity sector will be most efficiently delivered on a European level with greater and significant levels of continental network interconnection and 'Europeanization' of power markets.

Vattenfall has serious concerns that the effect of the proposed market reform could threaten the principles of the liberalised market and the development towards an internal EU electricity market.

Vattenfall believes that the EU Emissions Trading Scheme (EU ETS) should be protected and developed as an effective system to positively influence investment decisions on low carbon generation by leveraging in a transparent and reliable CO₂ emission price across Europe based on increasing European ambition-levels. In the event that the EU ETS is not yet able to wholly support low carbon generation a specific support scheme is a sensible response.

With these principles in mind, Vattenfall would prefer the retention of the Renewables Obligation operating in a well functioning, liberal and increasingly European electricity market.

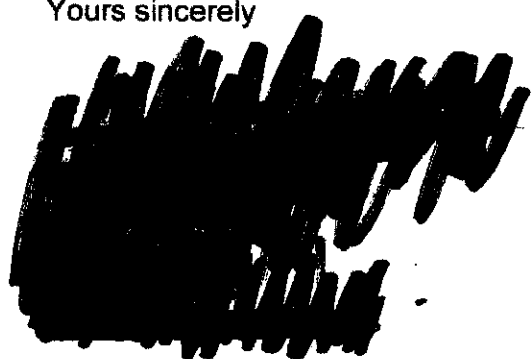
However, in the event the current system for supporting renewable electricity in the UK would be replaced, Vattenfall would, dependant upon its final design and the results of forthcoming investigations into market liquidity, prefer a Feed-in Tariff with Contract for Difference for generating technologies that need it and a targeted capacity mechanism as a last resort. We do not support the introduction of a carbon price floor nor an emissions performance standard as it would undermine the EU ETS.

Vattenfall is a major investor in wind power in the UK and since 2008 it has invested around £1.5 billion on projects including Thanet, Ormonde and Edinbane. We also see the UK as a significant growth market for wind power and we are currently in partnership with ScottishPower Renewables for the development of the East Anglia Round 3 zone.

Capital investment decisions in the future, for projects including Round 3, will take into account investment returns, continued and political support for low carbon generation, regulatory stability and long term, predictable markets. One of the key objectives of EMR is to increase the availability of investment in low carbon generation and so any intervention by government in energy markets should be measured against these important principles. These principles have guided Vattenfall's response and I hope you find it useful.

If you would like to discuss any of the points that we raise please get in touch.

Yours sincerely



VATTENFALL'S RESPONSE TO THE PROPOSAL FOR THE UK ELECTRICITY MARKET REFORM 2011, A FEED-IN TARIFF SCHEME WITH CFD, CAPACITY PAYMENTS AND EMISSION PERFORMANCE STANDARD

Introduction

This paper contains Vattenfall's response to the UK Government's Electricity Market Reform package which includes proposals to replace the UK's current scheme for supporting renewable electricity production (the Renewables Obligation) with a new feed-in tariff system (FIT), capacity payments and emissions performance standard (EPS).

Our response regarding the national CO₂ price support mechanism (carbon price floor) was submitted to HM Treasury through a separate consultation process in February 2011.

Vattenfall fully understands the UK Government's general objectives of creating the necessary conditions for achieving its long-term climate targets and decarbonising the power sector. The ongoing efforts to improve the liquidity by Ofgem must preferably precede any policy actions that would be suggested due to this consultation.

Vattenfall's general view

- The heart of a well-functioning electricity market is a well-functioning wholesale market. A market price that correctly reflects scarcity is a cornerstone for a well functioning wholesale market. Vattenfall strongly promotes the implementation of the European Target Market Model, agreed at the Florence Forum, with transmission rights, day-ahead price coupling and continuous intra-day trade, to constitute the design of the European market. This will lead to enhanced efficiency of the operation of production and infrastructure. The EU Council recently announced the target to establish the internal market for electricity in 2014. The roadmap is clear and adjustments of national markets must align to the European Target Model. Any policy intervention must be carefully evaluated so that the market is allowed to perform its functions and the price signals without distortion. Therefore it is better to have good design in place before policy measures are implemented than the other way around.
- Efficient and non-discriminatory utilisation of the European transmission grid is a prerequisite for the development towards a true pan-European electricity market. The coming expansion of transmission capacity cross border will lead to enhanced integration of the electricity market in Europe. Currently the UK is weakly connected to the rest of Europe. Vattenfall believes that the UK market should see a substantial increase of the interconnection capacity towards the rest of Europe.

Feed-in Tariffs

- Vattenfall is in favour of a European support system that is based on technology neutrality and market oriented and thus creates a level playing field. A harmonised mechanism for the promotion of renewable energy sources is preferred, and as studies show, because substantial cost reductions are likely if open trade is possible.

However progress towards this is slow because energy policy remains, by and large, the preserve of national governments.

- Vattenfall is convinced that the EU ETS is fully capable of delivering deep CO₂ cuts and that it should be the principal instrument to promote low-carbon measures. This implies that ambitions of reducing the CO₂ emissions should be reflected in the EU-wide allowance cap and that the EU ETS system needs to be the major direct climate policy instrument as far as the sectors covered by the ETS directive are concerned.
- Low carbon generation which has achieved full commercial maturity should only be supported by a well functioning EU ETS and the wholesale price for electricity. Support can be used for a technology to drive it along the learning curve during a limited time. Unnecessary subsidies must be avoided as a mean to maintain a competitive market under the EU ETS.
- The total costs for reaching the EU's renewable target by 2020 will increase year by year. The cost increase for customers has just started and customers may start to react when they experience the increased costs. The cost development for customers will be quite different in different Member States due to available domestic resources and the specific national support schemes. In Sweden the customer costs for the national support scheme for promoting electricity generation from renewable sources will be at the level of 0.6-0.8 €cents/kWh during 2010 up to 2020 and in Germany the corresponding customer costs in 2010 will increase from 3 to 4 €cents/kWh in 2020. Too high costs imply political risks which undermine the delivery of overall EU targets. Therefore all measures for reducing costs are important.
- In the latest communication (31.1.2011) the EU Commission states: "For both Member State and European financing of renewable energy, it is clear that the existing framework must be improved, if the EU is to reach its 2020 targets at the lowest possible cost." The commission urges that one of the means is to use and develop the so called cooperation mechanisms contained in the renewables directive (2009/28/EC).
- According to the renewable directive a review of national support schemes will take place in 2014 and one possible outcome will be to encourage even more the cooperation. Vattenfall considers Member States with more market based support schemes to be better prepared for co-operation than others.
- UK resources on land are limited and the challenging renewable target will make it necessary to promote offshore renewable technologies even though they are less mature and currently more costly. Vattenfall also appreciates the way the UK has tried to differentiate the support scheme to meet the significant cost difference between different less mature technologies and at the same time keeping market elements as far as possible in the scheme.
- One very important criterion for market based support schemes, like the proposed FIT/CfD and the FIT premium proposals, is a well-functioning and liquid electricity market in UK. A liquid wholesale market is needed to ensure a price formation which is transparent and which reflects the scarcity values in the market. It is only from a price formation that truly reflects underlying supply and demand a price index to be used in

the FIT/CfD calculations can be constructed. A liquid market will also be needed for day ahead price coupling with North West Europe.

- Vattenfall endorses the continuation of market elements in the UK support schemes, even in the future. However, as the current system has led to significant investment in renewable generation, the proposal to replace the RO in 2017 with a form of Feed-in-Tariff is disappointing.
- The evidence shows that development of renewable electricity technologies which have not yet reached full commercial maturity require varying degrees of additional support like that provided under the banded RO. Vattenfall would therefore prefer the retention of the RO.
- The banded RO has promoted significant investor interest and confidence in new generation; the failure to deliver annual targets (as indicated in the obligation) is largely related to failures in planning systems to deliver timely decision making, belated moves to encourage significant investment in electricity networks and the low liquidity in the electricity market. The significant changes being proposed if poorly implemented will have a significant impact on investor confidence in new low carbon generation in the UK.
- Given that the RO will be replaced, Vattenfall agrees that the FIT with CfD is probably the best policy. This conclusion is conditional on the assumption that its design issues are solved in a sufficiently credible way. Nevertheless, in order for the UK market to not lose pace in terms of renewable growth, keeping the existing RO would be an option.
- The UK Government's proposed intentions to radically change the support scheme must include mechanisms to guarantee long run stability of the support system in light of other likely market design changes. Vattenfall would therefore like to see the following upcoming changes in relation to the new support scheme:
 - *Increased cooperation between nations*
The review of the EU-directive in 2014 that may encourage a development of national support schemes to enable cooperation between member states.
 - *Incorporation of better and transnational infrastructure*
The North Sea Countries' Offshore Grid Initiative (December 2010) and the ENTSO-E's report Offshore Grid Development in the North Sea (2011-02-02) are relevant here. The ENTSO-E report aims at a reliable integration of the North Sea's offshore grids, linking offshore wind farms, with interconnections between Scandinavia, the British Isles and Continental Europe. ENTSO-E therefore recommends a coordinated and integrated offshore grid aiming at fewer landing points, accommodating larger and more distant-from-shore wind farms, and efficiently enabling trade between the North Sea countries. ENTSO-E concludes that the current approach of radial shore-to-shore connections will reach its limits, as TSOs expect major increases of wind generation volumes in the North Sea, by 2030. Costs savings for coordinating the grid offshore may be in the range of 10% (€7bn). Although the costs savings will occur after 2020 the support schemes must be able to meet the new conditions. A *properly* designed support scheme for offshore in UK may be the first scheme prepared for such an integration.

Options for Market Efficiency and Security of Supply

- The long run adequacy and security of supply in the electricity market is best ensured by correct prices to all actors in the energy and balancing markets. In addition, the costs of scarcity in extreme situations may be substantially lowered if the future infrastructure enhances the possibility of distribution networks and customers to react whenever prices are signaling extreme scarcity. Thus Vattenfall believes that a good market design with processes accommodating actors to react on proper signals is sufficient to ensure a good level of system security.
- If a capacity mechanism is introduced it is of utmost importance that it does not interfere with price formation deterring profitability by crowding out generation and demand adjustments not included in the mechanism.
- As long as the capacity mechanism is used as a measure of last resort, it could be implemented without distorting prices on the wholesale market.

Emissions Performance Standard

Vattenfall's view is that a well functioning European emissions trading system (EU ETS) is decisive for the development and commercialisation of the technical solutions needed to combat climate change. From a general point of view, Vattenfall therefore opposes interventions in the EU ETS. This also, principally, goes for introduction of an EPS. This position is based on the following arguments:

- An EPS added to activities covered by the EU ETS would not further reduce the European emissions of CO₂, which are ultimately determined by the total allowance cap in the EU ETS.
- An EPS could, more or less, distort the main purpose of the EU ETS to get abatement measures carried out in cost merit order.

Responses to questions raised in the consultation document

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?

Vattenfall considers that the "Target" model, agreed upon in the Florence Forum, together with a CO₂ price that internalises the external costs of CO₂, would be sufficient to deliver adequate investments. However, to achieve a sound development, the member states should help developers navigate permitting and licensing procedures for generation, distribution networks and transmission grids. These procedures must be faster and the outcomes more foreseeable if the UK and the EU are to achieve their low carbon energy objectives.

The extensive changes on a European level as well as in the UK, demand equally large changes in how infrastructure should be operated and developed. Thus, rather than implementing local support schemes and market designs we propose: a) further harmonisation with rules and design with the Nord Pool region and the region Central-West-Europe (CWE); b) a strong reform of the licensing and permitting procedures aiming for a maximum of three years to deliver on each proposal; and, c) promotion of trading solutions of green power

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

Security of supply is at risk if a hybrid between a fully regulated electricity market and a fully liberalised electricity market is established. Vattenfall believes that a liberalised market, with the external costs internalised, can supply electricity cost efficiently and at an excellent level of security and reliability. The hybridisation of market principles and centrally administered regulation, as presented in the Consultation, creates several problems. Security of supply and investments in base and peak load are best obtained by a level playing field with correct prices. Thus, rather than giving subsidies to government chosen technologies Vattenfall considers a European Emission Trading System that works as most important. In addition, the European power system needs to get better integrated through more interconnectors, thus increasing the scope of shared "reserves".

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)?

One of the main differences between Feed-in tariff schemes (FIT) and certificate schemes is that in the latter the volume is capped by an obligation and that price is set by the market and for FIT schemes, it is the other way around, prices are set by the government or another centralised mechanism and the market is setting the volume without limitations.

The implementation of a FIT-scheme introduces a volume risk, which may be necessary to control by introducing other regulatory measures.

Another feature associated with FIT schemes, thus fully in line with the renewable EU-directive, is priority access, which is contrary to a well-functioning electricity market.

Vattenfall agrees on the pros and cons with a **fixed feed-in scheme**. The most striking negative feature is that the electricity output does not participate in the electricity market and hence does not contribute to liquidity in the market.

Regarding the **premium feed-in scheme**, the calculation of a fixed premium on top of the electricity price for 20 years, requires a liquid electricity market so credible forecasts of the underlying electricity prices can be done.

Future electricity prices depend on political decisions regarding carbon tax, other taxes, etc., which may make it difficult to establish long-term electricity price forecasts and consequently to decide upon a properly matched fixed premium for 20 years.

More interconnection capacities will be beneficial for UK with a growing need for balancing of increasing share of intermittent and inflexible generation.

For a **feed-in scheme with contract for differences (CfD)** the long term electricity price risk is reduced compared to the situation for the premium feed-in scheme. But still the electricity market must be liquid so the reference price for calculating the CfD properly reflects the actual electricity price in the market.

4. Do you agree with the Government's preferred policy of introducing a contract for difference based feed-in tariff (FIT with CfD)?

For the EU 20-20-20 targets, three different initiatives (ETS, renewable energy and energy efficiency) have been developed, the so called "green package". The targets have different purposes; the ETS directive for reducing emissions, the RES directive and energy efficiency targets for improving the security of supply.

The purpose of the FIT CfD is addressing stimulation of low-carbon investments. Basically this is the purpose of the EU ETS system. There is a risk that the proposed support scheme is confusing the need for low carbon investments with reaching the renewables target.

Low carbon generation which has achieved full commercial maturity should only be supported by a well functioning ETS and the wholesale price for electricity. Unnecessary subsidies must be avoided as a mean to maintain a competitive market under the EU ETS.

The RO has been a well-functioning driver for new investments in new renewable generation. Unfortunately, the current discussion about changing the RO system to another system has in itself caused uncertainties among investors, and thus consequently lead to delays.

Given that it will be determined to replace the RO, Vattenfall agrees that the FIT with CfD is probably the best policy. This conclusion is conditional on the assumption that its design issues are solved in a sufficiently credible way. Nevertheless, if you would not like to lose pace in terms of renewable growth, keeping the existing RO would be an option.

It is important that the design of a new support scheme can meet possible future changes introduced by the EU Commission and also new conditions established by a development of a coordinated grid in the North Sea.

For North Sea offshore grid coordination, it is important that the grid will be developed and optimised from a technical and regional economic perspective and not from how national support schemes are designed today. The electricity from offshore plants connected to a coordinated grid will flow to regions with highest electricity prices and not to countries where the subsidies are the highest. This will require a coordination of the national support schemes offshore so countries can benefit from renewable electricity generation irrespective of where the electricity flows. This may indicate that the trade of electricity and the renewable value must be separated. The lead time for setting up a coordinated North Sea offshore grid is long but the same applies for changing a support scheme. Ideas on designing such a coordinated support scheme must be developed as soon as possible due to the long lead times required for participating countries in the North Sea to adjust and accommodate their national schemes to be operational in the North Sea. A national support system that will be in operation after 2020 for North Sea investments must be prepared for being coordinated with a joint scheme. A new UK support scheme must be developed in such a way so that as the North Sea grid develops the UK can operate alongside other markets without requiring significant regulatory change. The UK could take a leading position for developing ideas on how to coordinate a multi-country offshore support scheme.

Vattenfall is, as one of the major investors, willing to assist with the design of support schemes needed for the future international market and regulatory developments.

Once more Vattenfall emphasise the importance of improving the liquidity of the electricity market if the preferred scheme is to be successful.

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?

New investors might be attracted to low carbon generation in the UK, maximising the availability of project finance debt and reducing the risk premium sought by investors by removing the risk of fluctuations. On the other hand the utilities with experience from constructing large complex projects (offshore wind, nuclear, etc.) are used to exploiting future price developments. A new political risk will be

introduced as it takes over long term electricity market risk. The consequences for long run investment dynamics are likely to be negative.

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?

For intermittent and inflexible generation efforts are focused on establishing as high availability as possible despite price levels. Decisions regarding operation are primarily based on safety considerations.

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?

In theory the cost of capital would be lower for projects eligible for support schemes guaranteeing the price level. Due to the nature of offshore construction but also the construction risks involved in nuclear new-built investors will still add a risk premium to cover for the complexity in construction. A high IRR will be requested even if the support schemes are more predictable. The different models will have a minor influence on Vattenfall's total capital cost.

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 existing the investor base?

Assuming a properly designed and effective model, a change of systems in UK will not influence our availability to finance projects in UK.

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?

The crucial parameter for the investments is the total income (electricity price plus subsidy). The predictability of the income and the risks are different for different support schemes. The predictability of the income in market based systems is very much due to how well the electricity market works, especially with regards to market liquidity. For FIT-systems the price may in a way be much easier to predict, but on the other hand, more interventions may take place, like adjusting the guaranteed price level, adjusting the needed volumes etc, and these are difficult to foresee.

How the conceptual FIT-models proposed, might influence Vattenfall's investment activities in UK, are hard to predict due to uncertainty about the way the different models will work.

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?

Vattenfall would like, once more, to emphasise that a liquid wholesale market is decisive for any market based scheme. Vattenfall considers it very hard to evaluate the proposals in the consultation without having a preceding discussion on how the future electricity wholesale market will function.

Transparent prices that correctly reflect the physical situation is crucial to a well functioning market and to ensure efficient operation of generation and grids. For FIT with CfD a trustworthy reference price is of utmost importance. An option to be considered is to give one power exchange the sole responsibility of incorporating the transmission grid in the price calculations. The power exchange would then have the sole responsibility over day-ahead transmission capacity between the UK and the rest of Europe in the price coupling mechanism. The power exchange would be responsible for calculating market prices based on participants' bids and offers in respect to available transmission capacities within the UK and between the UK and the rest of Europe. These ideas are in line with the target model for the electricity market agreed at the Florence Forum. Vattenfall intends to communicate these and other ideas to Ofgem in the ongoing process to improve the liquidity of the electricity market in UK.

The consultation documents lack a thorough analysis of the transmission network (i.e. neither present congestions, nor future possibly evolving congestions as a result of the proposed reforms, are addressed). The reference price for the FIT with CfD must be very clear on how it relates to any congestion in the transmission grid.

Vattenfall tentatively suggests that the preferred reference price is the short term prices established in a liquid day-ahead market.

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

We assume that the scheme will be designed to comply with the renewable energy target set by the EU Commission, by increasing renewable production in UK. Cost efficiency must be one important criteria meaning that the most cost efficient generation must be incentivised, generating a high output at the lowest cost. In any such scheme the generator should be paid based on the output.

Emissions Performance Standard

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 EU ETS should be the main vehicle to decarbonise the electricity sector. An EPS as an additional carbon instrument should not be considered since it will not contribute to reducing CO2 emissions from a European and system perspective, but merely distort the price signal and weaken the EU policy.

13. Which option do you consider most appropriate for the level of the EPS?

Due to uncertainties and complexity of the issue Vattenfall has not answered here but is prepared to contribute in a future discussion and analysis of this issue (This is also the case regarding question 14 and 15).

- What considerations should the Government take into account in designing derogations for projects forming part of the UK or EU demonstration programme?

14. Do you agree that the EPS should be aimed at new plant, and 'grandfathered' at the point of consent?

Due to uncertainties and complexity of the issue Vattenfall has not answered here but is prepared to contribute in a future discussion and analysis of this issue.

- How should the Government determine the economic life of a power station for the purposes of grandfathering?

Due to uncertainties and complexity of the issue Vattenfall has not answered here but is prepared to contribute in a future discussion and analysis of this issue.

15. Do you agree that the EPS should be extended to cover existing plant in the event they undergo significant life extensions or upgrades? How could the Government implement such an approach in practice?

Due to uncertainties and complexity of the issue Vattenfall has not answered here but is prepared to contribute in a future discussion and analysis of this issue.

16. Do you agree with the proposed review of the EPS, incorporated into the progress reports required under the Energy Act 2010?

17. How should biomass be treated for the purposes of meeting the EPS? What additional considerations should the Government take into account?

Due to uncertainties and complexity of the issue Vattenfall has not answered here but is prepared to contribute in a future discussion and analysis of this issue.

18. Do you agree the principle of exceptions to the EPS in the event of long-term or short-term energy shortfalls?

No, the first option should be to stimulate demand flexibility.

Options for Market Efficiency and Security of Supply

19. Do you agree with our assessment of the pros and cons of introducing a capacity mechanism?

Vattenfall interprets the proposal as driven by the expectation of falling capacity margins and that the proposal reflects the Government's determination to ensure sufficient capacity in peak load situations.

Before capacity mechanisms are discussed it's important to note that the market arrangements must be such that the market is allowed to work.

Security of supply is a key issue for society's confidence in the liberalised electricity market. A long term solution that promotes economically efficient and socially acceptable level of security of supply is therefore extremely important.

The proposed introduction of a capacity mechanism should be viewed in the light of the package of changes to a low carbon electricity system. The share of intermittent and inflexible production will increase and will require accompanying flexible resources to ensure an acceptable level of security of supply. In this respect the importance of extending the transmission network should be further emphasised: extension could be an efficient replacement of centrally procured capacity reserves.

If a capacity mechanism is introduced it is of utmost importance that it does not interfere with the price formation deterring profitability by crowding out generation and demand adjustments not included in the mechanism. The centrally acquired capacity should only be used as a last resort measure in such a manner that true scarcity prices are not suppressed or distorted.

Vattenfall believes that it would be beneficial if targeted demand flexibility was prioritised in the mechanism as this would stimulate an increase in demand flexibility.

20. Do you agree with the Government's preferred policy of introducing a capacity mechanism in addition to the improvements to the current market?

A market based solution supporting security of supply is critical depending on the market arrangements (see also question 19). The incentives for keeping existing generation in operation as well as the incentives for investment in new generation is much reduced if correct scarcity prices, which give a substantial contribution to the annual income for a power plant, are artificially suppressed, e.g. by a misuse of centrally procured capacity.

The most important long term solution to generation adequacy is to utilise the demand side price elasticity. Future market design must accommodate more flexible generation and consumption. It will become increasingly important that customers can react on prices and thus control the consequences of their costs of their chosen consumption pattern. This would strongly relieve the stress in the overall market as well as bring benefits to customers. The more demand response is developed, the less will be the need for centralised capacity solutions.

No price caps or floors or ways to use emergency reserves to artificially smooth out the price variations should be used. Instead, efforts should be made to develop metering and settlement infrastructure and automation systems, thus supporting customers to take responsibility for their own consumption hour by hour.

21. What do you think the impacts of introducing a targeted capacity mechanism will be on prices in the wholesale electricity market?

As long as the capacity mechanism is used as a measure of last resort, it could be implemented without distorting prices on the wholesale market. A prerequisite is that contracted capacity does not at any time compete with resources active in the market. Long term, it is of decisive importance that the price formation stays unaffected so that the incentive to invest in new peak load capacity is not distorted. Vattenfall believes that the goal should be to have as small reserves as possible and the key is to increase demand response (see also question 20).

If economic dispatch is used it would affect price formation so that prices become too low to motivate investments in resources not depending on separate payments for capacity. The implication may be too little investment to ensure security of supply which will raise a need to gradually expand the amount of capacity supported in the capacity mechanism.

If it is decided to activate the resources based on economical dispatch, the mechanism must be given to all capacity so as not to end up with gradually increasing amounts of centrally supported capacity. However, such a support mechanism to capacity is not aligned with a well functioning market.

To ensure that the resources contracted under the last resort, targeted capacity mechanism are not distorting the market, Vattenfall suggests that the System Operator is given the task to bid the resources into the market.

22. Do you agree with Government's preference for the design of a capacity mechanism?

- a central body holding the responsibility;
- volume based, not price based; and
- a targeted mechanism, rather than market-wide

With today's metering technology in the UK it is not currently possible to instantaneously control or stop the physical delivery to customers belonging to a specific supplier (although Vattenfall recognises that there is a developing strategy to achieve this). Without such a physical link between customer and supplier, it is not possible to disconnect a specific client when his particular supplier lacks the means for the agreed delivery. The security of supply therefore can be regarded as a public good.

The capacity mechanism addresses the public good characteristic of this fundamental responsibility in liberalised electricity markets. Decentralising the responsibility implies a risk for free riding. As long as security of supply is regarded a public good there may be a need to implement a centrally managed reserve. Nevertheless, as a matter of principle Vattenfall considers that the market arrangement should be such that the market by itself could ensure a level of security of supply that would be acceptable to consumers. The first step would be to monetarily award demand and supply flexibility through allowing correct scarcity prices.

However, if a capacity mechanism is to be used in strained peak load situations, Vattenfall regards the preferred option to be a targeted mechanism, volume based with a central body holding the overall responsibility.

A targeted mechanism not only requires setting the total volume of capacity needed, but the central body has to estimate how much resources the market will provide and how much additionally resources that would be needed. The mechanism for this was not clearly described in the consultation documents.

Furthermore, there are other difficulties of targeted mechanism mentioned in the impact assessment (e.g. 'slippery slope' issue, market distortions). The decision on how much capacity to tender should preferably be based on a probabilistic approach in which the amount of capacity is decided based on the, from a societal point of view, optimal level of security of supply if the forecasts on, for example, consumption levels are realised. An administratively set capacity margin may imply that too much or too little capacity is covered leaving society with either inefficiently high costs or a security of supply that falls below the social optimum. A legally fixed capacity margin fails to address the dynamic issues of supply security.

Finally, the amount of reserve capacity should be the result of a predefined adequacy level. Ultimately, the acceptable level of security of supply, and the costs to meet this target, is a task for the Government to decide upon.

23. What do you think the impact of introducing a capacity mechanism would be on incentives to invest in demand-side response, storage, interconnection and energy efficiency? Will the preferred package of options allow these technologies to play more of a role?

Demand response is dependent on price signals. The introduction of a capacity mechanism implies a risk for distorted prices and economically dispatched reserves risk crowding out generation otherwise economically viable to keep in operation. Administratively suppressed and distorted prices take away economic incentives to respond. Prices not reflecting the true scarcity situation imply that demand will not, on economically sound motives, adjust electricity usage when the socioeconomic value is the highest.

Therefore, as long as the mechanism is targeted and dispatched as a last resort measure without distorting the price mechanism it could coexist with the mentioned "technologies".

24. Which of the two models of targeted capacity mechanism would you prefer to see implemented.

- Last-resort dispatch, or
- Economic dispatch.

Vattenfall is in favour of the "Last-resort" dispatch model.

25. Do you think there should be a locational element to capacity pricing?

The EMR does not include a thorough investigation of the transmission grid; neither present nor expected future congestions are included. Congestions must be managed foremost with economic efficiency. In case there are congestions these must be taken into account when deciding which resources should be part of the capacity mechanism and where. It is however important that the resources in the capacity mechanism should only be used to balance the system in peak-load situations. The resources should not be used as a resource to manage congestions. If the capacity mechanism is used for congestion relief it deteriorates the incentives for National Grid to reinforce the transmission grid.

Analysis of Packages

26. Do you agree with the Government's preferred package of options (carbon price support, feed-in tariff (CfD or premium), emission performance standard, peak capacity tender)? Why?

The hybrid model suggested with rather large amount of subsidies (FIT CfD) and national solutions for CO₂-prices (Carbon price support and EPS) creates a strong dependency on well functioning centralised administrative mechanisms rather than trusting the dynamics of a liberalised market.

A well functioning EU ETS and wholesale price for electricity should be considered and supported because it is from here that the main incentive for low carbon generation is sourced.

The banded RO has promoted significant investor interest and confidence in new generation and Vattenfall regrets from an investor perspective a decision to replace the RO in 2017 with a type of Feed-in-Tariff.

27. What are your views on the alternative package that Government has described?

Foremost, with a feed-in system it is very difficult to forecast the amount of investments actually made whereas a green certificate gives a clear signal to all actors how much renewable capacity that will be built. Vattenfall would therefore prefer avoiding a non capped fixed feed-in tariff system.

In addition, a national solution on the CO₂-pricing issue may erode the EU ETS, thus making a long run viable international agreement on this harder to reach.

The proposal of a peak capacity tender is probably the best design if such a tender should take place. However, the Swedish Government has decided to phase out this mechanism and fully trust the market by 2020. This is achieved by actively involving demand response in the peak capacity tender, thus phasing out generation. In addition, when real time metering is in place in Sweden and customers react to correct prices there are strong indications that demand response will be sufficient to cover the worst situations. However, this requires a well functioning day-ahead and intraday market where all actors face and are responsible for the balancing costs they create.

28. Will the proposed package of options have wider impacts on the electricity system that have not been identified in this document, for example on electricity networks?

By creating a package that foremost consists of administrative actions there will in the future be less room for market dynamics and market processes to thrive.

Generally Vattenfall believes that centralised administrative measures in contrast with correct market prices leads to a decrease in the innovation rate, be that in technological or stakeholder interaction. One example of the latter could be an increase in distributed generation and thus the increase of "prosumer" actions. In addition, by only considering one part of the market, the supply side, you miss a cost efficient inclusion of demand response in the policy package.

The transmission network has not been addressed thoroughly. The reform may impact congestions and the costs from congestion management should also be addressed.

29. How do you see the different elements of the preferred package interacting? Are these interactions different for other packages?

To achieve decarbonisation by both giving subsidies and a CO₂-price creates a situation where two policy goals compete. Thus, to a certain extent the administrative costs to achieve the decarbonised society would be higher than necessary. The proposed emissions performance standard will have similar consequences. In principle, Vattenfall argues for a harmonised European policy with a European price on CO₂, preferably by continuing and improving the EU ETS. In addition, obstacles to develop the infrastructure at a preferable rate must be removed. For example, we think that the licensing and permitting processes for new generation and transmission grid development must be rationalised to provide timely and clear decision making.

Implementation Issues

30. What do you think are the main implementation risks for the Government's preferred package? Are these risks different for the other packages being considered?

A huge change of the electricity market's functioning as proposed implies new and, to some extent, unknown regulatory risks due to not yet decided details of the proposals; meanwhile a lot of investment activities are ongoing. The main result, according to the simulations in the documents, are much lower CO₂ emissions, which of course is a welcome result. The reduction though will come from the national electricity sector that is participating in the EU ETS scheme. On the EU level the volume of issued CO₂-allowances will not be affected by national initiatives meaning that even if UK would like to stress a tough national target the emission reductions and targets on the EU level will not be changed. According to the analysis the net effects for customers are marginal in comparison with the baseline.

A national target stimulating new generation will of course also enhance the security of supply.

In all, additional regulatory risks are introduced by proposing a huge change of the electricity market without addressing all the necessary details, resulting in a national benefit in terms of CO₂-emission reduction, which has no immediate benefit on the EU-level.

The risks to a move towards greater European electricity market harmonisation should also be assessed.

For further elaboration on the proposals the impact on administrative costs, dynamics in innovation and crowding-out of sound carbon free generation, crowding out of demand response must be considered.

31. Do you have views on the role that auctions or tenders can play in setting the price for a feed-in tariff, compared to administratively determined support levels?

Auctions and tenders are basically good market-based instruments fostering competition, but Vattenfall is against auctions despite the available technology, not as a principle, but rather based on experiences from a number of countries.

In general auctions or tenders only focus on the lowest bidder. In case it is decided to use either of the methods it would be of absolute importance to evaluate proposals from other perspectives as well (i.e. financial strength, capability of delivering in time, etc.). In those countries where auctions have been applied the governments have had difficulties to predict the behaviour of the bidders. In some cases the bid winners have caused delays and sometimes withdrawn projects.

An introduction of auctions or tenders for the Round 3 zones under development would not make sense. Naturally, the implementation pace would suffer enormously in case the current developers are not given the permit to construct.

Administratively determined support would be the preferred option but the prices have to be set by heavy involvement of the investors. The RO banding is an example that has been working until today. The support has been flexible depending on the cost for the renewable generation and the risk premium resulting in the hurdle rates for investments.

The UK government could also consider the introduction of more transparency to safeguard adequate profitability for the investors

- Can auctions or tenders deliver competitive market prices that appropriately reflect the risks and uncertainties of new or emerging technologies?
Vattenfall does not support auctions

- Should auctions, tenders or the administrative approach to setting levels be technology neutral or technology specific?
For promoting cost efficiency, a technology neutral approach is the preferred solution when applied to mature technologies. UK has however got a very challenging national target for renewable energy, which makes it necessary to promote offshore technologies even though they are less mature and currently more costly. Vattenfall believes that some kind of support differentiation between various immature technologies is still necessary, and our view is that the banding regime has worked well. Vattenfall considers it important that immature technologies are given R&D support. The volumes for these technologies must be capped when included in general support schemes for not driving the customer costs in an uncontrolled way.
- How should the different costs of each technology be reflected? Should there be a single contract for difference on the electricity price for all low-carbon and a series of technology different premiums on top?
Given a FIT, the long run marginal cost (LRMC) per megawatt-hour for different technologies is the best method to set the required support level.
- Are there other models government should consider?
Cooperation mechanisms, provided the renewable directive, as means to enhance cost efficiency have not been considered as a complementary option by the UK government. Sweden and Norway are very likely to enter into joint support scheme cooperation from 2012, which will improve the cost efficiency according to both Governments. The EU-commission underlines in their latest communication the use of cooperation mechanisms as an option to cut costs. The internationalisation of the electricity market strengthened by reinforcement of cross border capacities will open up for further possibilities of cooperation. Therefore, it would be appropriate to consider how to support offshore technologies in the North Sea in the light of a coordinated grid in the future.
- Should prices be set for individual projects or for technologies
For technologies otherwise the efficiency of the system will suffer. To get the most off take from the premium support the prices have to be set for technologies or else the risk of supporting "bad" projects is high.
- Do you think there is sufficient competition amongst potential developers /sites to run effective auctions?
Vattenfall does not support auctions
- Could an auction contribute to preventing the feed-in tariff policy from incentivising an unsustainable level of deployment of any one particular technology? Are there other ways to mitigate against this risk?
Vattenfall does not support auctions

32. What changes do you think would be necessary to the institutional arrangements in the electricity sector to support these market reforms?

For the proposed reforms the procedures regarding planning permission and licensing must be improved.

33. Do you have view on how market distortion and any other unintended consequences of a FIT or a targeted capacity mechanism can be minimised?
The heart of a well-functioning electricity market is a well-functioning wholesale market. A market price that correctly reflects scarcity is a cornerstone for a well functioning wholesale market. The first option to minimise distortions is to introduce a market design that enables the promotion of a transparent price formation that correctly reflects scarcity. Vattenfall strongly promotes the implementation of the European Target Market Model, agreed at the Florence Forum, with transmission rights, day-ahead price coupling and continuous intra-day trade, to constitute the design of the European market. This will lead to enhanced efficiency of the operation of production and the infrastructure. The EU Council recently announced the target to establish the internal market for electricity in 2013/14. The roadmap is clear and adjustments of national markets must align to the European Target Model. Any policy intervention must be carefully evaluated so that the market is allowed to perform its functions and the price signals not distorted. Therefore it is better to have good design in place before policy measures are implemented than the other way around.

Efficient and non-discriminatory utilisation of the European transmission grid is a prerequisite for the development towards a true pan-European electricity market. The coming expansion of cross border transmission capacity will lead to further integration of the electricity market in Europe. Currently the UK is weakly connected to the rest of Europe. Vattenfall therefore considers it important to promote a substantial increase of the interconnection capacity towards the rest of Europe. More interconnectors will, in addition to enhanced market integration, counteract any need to centrally procure capacity within a capacity mechanism.

If a capacity mechanism is introduced it is of utmost importance that it does not interfere with the price formation deterring profitability by crowding out generation and demand adjustments not included in the mechanism. The centrally acquired capacity should only be used as a last resort measure in such a manner that true scarcity prices are not suppressed or distorted.

34. Do you agree with the Government's assessment of the risks of delays to planned investments while the preferred package is implemented?
Yes. There is a real risk of significant investment hiatus if the new regime is introduced in a way that undermines confidence.

35. Do you agree with the principles underpinning the transition of the Renewables Obligation into the new arrangements? Are there other strategies which you think could be used to avoid delays to planned investments?
A well organised and properly designed transition is essential if a damaging investment hiatus is to be avoided. The 'grandfathering' of investments and the

'vintaging' of the RO beyond 2017 are important if momentum in the industry is to be maintained.

36 We propose that accreditation under the RO would remain open until 31 March 2017. The Government's ambition to introduce the new feed-in tariff for low carbon in 2013/14 (subject to Parliamentary time). Which of these options do you favour?

- All new renewable electricity capacity accrediting before 1 April 2017 accredits under the RO;
- All new renewable electricity capacity accrediting after the introduction of the low-carbon support mechanism but before 1 April 2017 should have a choice between accrediting under the RO or the new mechanism.

The provision of choice is to be welcomed however the different regimes working in parallel do pose a number of challenges.

The four year period of transition provides only a one year window of opportunity to choose for developers of very large scale renewables, as in the Round 3 programme. This is because large projects are generally constructed over a three year period from final investment decision to first power (the point of accreditation under the RO). Therefore, a developer at FID (a potential point for CfD to be 'signed') may only have a choice in 2013/14, thereafter, given the uncertainties of offshore wind construction, it will have no choice but to choose the FIT.

This also underlines the importance of completing all legislative measures for a new regime in a timely manner. It is possible that secondary legislation and necessary code or license arrangements will not be in place until 2014, and there is even a risk of later implementation if the EMR timetable slips from what is currently set out thus limiting the period for making a choice even further.

It needs also to be clarified that if a developer chooses to work under the RO in the transition period but, through no fault of the developer, the project does not produce first power by 31 March 2017 (e.g. late network connections), it can then switch to the new regime without penalty.

An alternative might be to extend the period of transition or to amend the point from which a project may be accredited under the RO. This point could start from consent, FID or turbine procurement especially if agreements such as grid connection liabilities are in place.

37. Some technologies are not currently grandfathered under the RO. If the Government chooses not to grandfather some or all of these technologies, should we:

- Carry out scheduled banding reviews (either separately or as part of the tariff setting for the new scheme)? How frequently should these be carried out?
- Carry out an "early review" if evidence is provided of significant change in costs or other criteria as in legislation?

- Should we move them out of the “vintaged” RO and into the new scheme, removing the potential need for scheduled banding reviews under the RO?

38. Which option for calculating the Obligation post 2017 do you favour?

Vattenfall can not at the moment foresee the consequences of the different alternatives proposed. Vattenfall will though emphasise the importance that any changes of the existing RO must provide a secure support for existing investments even in the future.

- Continue using both target and headroom
- Use Calculation B (Headroom) only from 2017
- Fix the price of a ROC for existing and new generation