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Page 1 of 1

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Dear Mr Wieckowski

Consultation on possible models for a Capacity Mechanism

As part of its proposals for Electricity Market Reform (EMR) the UK Government is consulting on proposals to promote investment, where necessary, in services designed to ensure security of supply.

Vattenfall supplies electricity, heat and gas to millions of customers across Northern Europe. It is the sixth 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. It is a major investor in wind and wave power in the UK.

Immediately below, Vattenfall provides a brief summary of its views on proposals for, and design of, a Capacity Mechanism.

Later on, it also responds to the questions posed in the consultation document.

UK Government proposals for a Capacity Mechanism

It is Vattenfall's view that 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 investment 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 that deters profitability by crowding out generation and demand adjustments not included in the mechanism. **A strategic reserve used as a measure of last resort could be a solution that does not destroy price formation.**

In addition, future market design must accommodate more flexible generation and consumption. Therefore, demand participation and other non-generation solutions such as storage and interconnectors should be favoured in the procurement of the strategic reserve.

I hope that you find this response useful. If you would like to discuss this or any other aspect of EMR with Vattenfall do not hesitate to contact me or my colleague [REDACTED] Head of Public and Regulatory Affairs in the UK.

Yours sincerely

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UK Country Manager, Vattenfall

C.6 Consultation Questions

Targeted Capacity Mechanism

Question 1: Does this table capture all of your major concerns with a targeted Capacity Mechanism? Do you think the mitigation approach described will be effective?

Vattenfall interprets the Governmental intention to introduce either a strategic reserve like the solution in the Nordic region or a mechanism that should be delivered by the regular market with separate payments for capacity in addition to payments for delivered energy. It is of utmost importance that the strategic reserve must not distort the price signal by suppressing true scarcity signals. The contracted capacity must not at any time compete with resources active in the market. Future potential demand response, not yet active in the market, must not be crowded out. A crowd out would be the risk if the scarcity signal is not allowed to work. The strategic reserve should therefore not be activated or bid into the market below VOLL. If a technical maximum price, to ensure market clearing, is used the reserve must not be bid in below the maximum price.

It is unclear from the White Paper in which market and time frame the strategic reserve is intended to be used.

Question 2: How long should the lead time for Strategic Reserve capacity procurement be and why?

The Government's intention with the strategic reserve is interpreted as being a more or less permanent solution without a particular end date. The idea to include new resources i.e. that the reserve should comprise investments in e.g. new generation capacity requires that the contract period can not be made too short. This implies a longer lead time between procurement tendering. However, the idea that the strategic reserve should include 'greenfield' plants is unrealistic as the reserve in an efficient market should be used very few, if any, hours.

Question 3: Should the length and nature of contracts procured by the Strategic Reserve procurement function be constrained in any way?

The most important long term solution to generation adequacy is to utilize 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 centralized capacity solutions. Therefore demand participation and other non-generation solutions such as storage and interconnectors should be favoured in the procurement of the strategic reserve.

It is important that reserves in the Short-Term Operating Reserve (STOR) and the strategic reserve are not mixed up. Thus, it should be made clear under what circumstances the strategic reserve is allowed to be used. Vattenfall thus agrees that the interaction between STOR and the strategic reserve should be carefully considered and the strategic reserve only used to address resource adequacy and the STOR for ensuring operational security.

Question 4: Which criteria should providers of Strategic Reserve be required to meet?

The most important criteria are rapid response time, high availability and low readiness and start up costs. The variable costs are of subordinate importance as the use of the reserve for energy production is limited which would be the case, for example, with open cycle gas turbines. The signal sent to the market should be the technical maximum price at the market, or the Voll. That price is higher than the price level customers are expected to act at and considerably higher than variable costs for Gas Turbines.

Question 5: How can a Strategic Reserve be designed to encourage the cost effective participation of DSR, storage and other forms of non-generation technologies and approaches?

Vattenfall welcomes the willingness to encourage non-generation technologies as part of the strategic reserve. It is more cost efficient for customers to refrain from consumption, reduce consumption or disconnect than it is to build new generation capacity. Thus, a tender would imply very high profitability for demand reductions given that all participants are given the same market price for capacity. Targeting demand side participation as the principal measure in the reserve would encourage demand response to evolve also outside the scope of the strategic reserve. One possible solution to stimulate demand response is to allow the participating DSR resource to use its responsiveness to price also on its own choice, which means that the resource owner can choose to not use electricity when it's cost effective from its own perspective. In case the demand response has not been activated and resource adequacy is threatened the SO activates the DSR as a last resort measure.

Question 6: Government prefers the form of economic despatch described here. Which of the proposed despatch models do you prefer and why?

If a capacity mechanism is introduced it is of utmost importance that it does not interfere with the price formation. Doing so would deter profitability by crowding out generation and demand adjustments not included in the mechanism. Hence Vattenfall prefers that 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. The Government's preferred economic despatch model and the price setting expressed is worrying: "setting the despatch price high enough to avoid significant distortions to the market" (p.170). The implication of just avoiding significant distortions is not enough when striving for well functioning markets. This raises questions like: who decides what is a significant distortion? What will the criteria be for deciding

what is a significant distortion? What are the long run implications for commercial investments in capacity? When administratively deciding the price level a possible risk for crowding out future commercially sound investments in demand, other non-generation and generation is built into the mechanism.

Question 7: How would the Strategic Reserve methodology and despatch price best be kept independent from short-term pressures?

The strategic reserve must be equipped with a mandate ensuring its sovereignty and objectivity against external pressure from the public, politicians and from the Government. One possibility would be to stipulate in any Bill how to define the dispatch price. This price could be based on estimation of Voll or if a technical maximum price is used that could set the limit when to activate the reserve. The technical maximum price would be relevant in case an auction is used for clearing the entire market.

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.

Question 8: Do you agree that a Strategic Reserve should be periodically reviewed? If so, who would be best placed to carry out the review and how often should it be reviewed?

The need for a strategic reserve implies a market failure. It is important that this alleged market failure is properly defined and that action other than government intervention is considered first. Vattenfall agrees that the need for a strategic reserve should be regularly reviewed, see also question 2. The review should be of several types. First the decided reliability level decided by the Government should be periodically reviewed. That review would be necessary as input to the entity responsible for the strategic reserve e.g. when deciding how much capacity to tender. In case the Government decides to implement an economic dispatch model the price used for activation must be carefully considered so that the reserve is not distorting the market. The regulatory authority must carefully monitor and review the strategic reserve and its close connection to the STOR already managed by the SO. The utilization of the strategic reserve must be fully transparent to the regulatory authority and stakeholders. A minimum requirement is that the regulatory authority continuously monitors any use of the strategic reserve so that potential misuse of the reserve is detected and counteracted.

Question 9: Into which market should Strategic Reserve be sold and why?

There are theoretically several potential markets where the Strategic Reserve could be sold. Irrespective of which market the strategic reserve is made available it is decisive that scarcity prices are not suppressed. It is important to note that the underlying reason for having the reserve is to "keep the lights on" by addressing the

generation adequacy issue. It's only in real time that the reserve will make a difference in respect to supply security as it could counteract involuntary load shedding.

Question 10: Do you have any comments on the functional arrangements proposed for managing a Strategic Reserve?

Vattenfall agrees that the strategic reserve should only address resource adequacy and operational security will be addressed by STOR in the future. Vattenfall welcomes the view that there will be limited interaction between the Strategic Reserve and the FiT CfD.

Question 11: Given the design proposed here and your answers to the above questions, do you think a Strategic Reserve is a workable model of Capacity Mechanism for the GB market?

Vattenfall reckons that it could be a workable if it is implemented as a last resort model thereby minimizing the potential negative effects on the market. If the government decides 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.

Market-wide Capacity Mechanism

Question 12: How and by whom should capacity in a GB market be bought and why?

With reference to paragraph c3.14: "For a Capacity Market it is possible that in future consumers could be more engaged in the decision about the minimum level of supply they require based on the cost to them of differing levels of capacity." Active customers are decisive. 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 recognizes 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 liberalized electricity markets. Decentralizing the responsibility runs the risk of 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.



In addition, the European-wide discussion of hourly metering should also address some of the free rider problem as described above. It is therefore important that new regulation takes into consideration this development.

But, as the introduction of market wide capacity mechanism is a far reaching measure it would be reasonable to consider a market-customer based approach also. This alternative would comprise an in-depth analysis of costs and benefits for empowering the customer with the possibility to choose the reliability level they want. Giving customers the choice of a particular capacity level will not individualize the reliability level. In either system there is a need for the entity supplying customers to ensure that enough electricity is injected to satisfy her commitments with her customers. If the Government decides to introduce a market wide capacity market the suppliers should be obliged to acquire capacity e.g. in proportion to contracted consumption.

Question 13: What contract durations would you recommend for a Capacity Market?

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Question 14: How long should the lead time for capacity procurement be? Should there be special arrangements for plants with long construction times?

See question 2.

Question 15: Should there be a secondary market for capacity? Should there be any restrictions on participants or products traded?

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Question 16: What are the advantages and disadvantages of making a central, administrative determination of (i) the capacity that can be offered into the market by each generator; (ii) the criteria for being available; and (iii) the penalties for non-availability? In outline, how would you suggest making these determinations?

In a centrally planned system detailed control is fundamental, however this leaves no room for innovation in the market. This will leave the society with inefficient solutions. It is important to specify the criteria's in detail regarding the specificities a generator should obey. The penalties for failing to meet these requirements must be perfectly clear.

Question 17: How should the reference market for reliability contracts be determined and what would be an appropriate reference market if it is set by the regulator? How could any adverse effects of choosing a particular option be mitigated?

The introduction of a reliability market is a far reaching measure which requires regulatory oversight. If the Government decides to implement reliability contracts close and transparent consultations with customers and industry stakeholders are of vital importance. In principal it should be the regulator that decide the reference market i.e. alternative (a) in paragraph C.3.49.

If a reliability market is created the price at any moment needs to reflect the scarcity value to the market participants.

Question 18: For a Reliability Market, how should the strike price be determined? If using an indexed strike price, which index should be used?

Pricing based on created indexes should be avoided.

Question 19: For a Reliability Market, what level of physical back up (if any) should be required for reliability contracts and how should it be monitored?

The discussion on requirements for physical back up implies that more capacity than contracted would be needed. The potential need for back up capacity points in the direction of the strategic reserve which is considered a more feasible option if a capacity mechanism is to be implemented. The amount of capacity should be of secondary importance to the goal to achieve a reliability level according to the wishes in the society and decided by the Government. Specifically targeting the amount of capacity is to start in the wrong end when addressing the resource adequacy issue.

Question 20: Do you agree that a vertically integrated market potentially raises issues for the effectiveness of a Reliability Market? If so, how should these issues be addressed?

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Question 21: What could we do to mitigate interactions between a Capacity Market (especially if a Reliability Market) and Feed-in Tariff with Contract for Difference without diluting the effectiveness of either?

Introducing several centrally decided payment mechanisms that may interact and possible imply double payments put a strong pressure on the Government and the Regulatory authority. The preferred option should be to strive to achieve the desired reliability level most efficiently. The strategic reserve seems more cost efficient and targets the problem of resource adequacy directly.

Question 22: How can a Capacity Market be designed to encourage the cost effective participation of DSR, storage and other non-generation technologies and approaches?

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Question 23: Do you have any comments on the functional arrangements proposed for managing a Capacity Market?

There must be a clear distinction between resources in a potential reliability market and resources in the STOR. They are addressing slightly different issues, the former resource adequacy and the latter operational security and utilization should be kept separate.

Question 24: Do you think that a trigger should be set for the introduction of a Capacity Market? If so, how do you think the trigger should be established, and how should it be activated?

In latest energy legislation Ofgem will adopt the role of monitor of capacity margin and can advise the UK Government of potential long term, structural short falls in generation in advance of that shortfall. Ofgem should use the adequacy reports done by the TSO for their judgment of the need to act.

Question 25: What is the most appropriate design of Capacity Market for GB and why?

The most appropriate mechanism is the "energy markets only". In such market the participants meet correct prices and long run investments will be cost efficient.

Capacity Mechanism Assessment

Question 26: What are your views on the costs and benefits of a Capacity Mechanism to industry and consumers?

If a capacity mechanism affects price it will have a long run detrimental effect on the long run market process. As such it is hardly possible to put a monetary value on this. However, the short run impacts with a fixed generation capacity should not be a difficult exercise. It is important that any calculations differ between the short run static results and the long run dynamics. The costs and benefits of these are very different.

Question 27: Which Capacity Mechanism should the Government choose for the GB market and why?

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 future infrastructure investment 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 that deters profitability by crowding out generation and demand adjustments not included in the mechanism. A strategic reserve used as a measure of last resort could be a solution that does not destroy price formation.

