DECC - Electricity Market Reform Consultation (Cm 7983)

Consultation response by [redacted]

This consultation response is informed by my service in the electricity supply industry from 1971 to 2006, latterly as Commercial Manager, Trading Arrangements with ScottishPower Energy Management Limited. My response could be considered to be a response to Chapter 4 of the consultation paper, *Security of supply and market operation of reforms*. In March 2010 I responded to an Ofgem consultation (part of Project Discovery) regarding the electricity market arrangements required to ensure security of supply. This response draws on that earlier work, a copy of which is attached, and further develops my views regarding the treatment of generation which has an uncontrollable energy source. It is clear to me that the current energy-only electricity market arrangements are incapable of delivering sufficient generation capacity of the right type and in the right location to meet the diverse objectives set for the industry by government and society. A system of capacity tenders seems to me to be the only way in which sufficient peak capacity, a desirable plant mix and the requisite level of security can be delivered. Some form of energy-only market needs to operate alongside the capacity tender system to ensure the efficient scheduling of plant.

A key component of a capacity tender arrangement would be the specification, by government, of the required level of security of supply. Such a definition[1] used to exist but, since no licensee is now responsible for ensuring that security is maintained, there is no longer any stated standard. I note that the consultation paper refers to "a central body" with the obligation to "maintain a set capacity margin" and fully support the identification of a person or body as being responsible for security of supply. However, security of supply cannot be measured using a simple "go/no-go" assessment of capacity margin. I note that the Energy Bill, currently before Parliament, requires Ofgem to publish a demand estimate for the period four years ahead, against which the probable and required capacity margin can be judged. I believe this process is doubly flawed. Firstly, my interpretation of the proposed legislation is that the estimates for demand and generation capacity are single, deterministic numbers; they should each be a probability distribution. The risk of failure to supply can then be derived from the overlap between the two distributions. Deterministic measures of capacity margin are too simplistic for this task. Secondly, the period of four years ahead is too short for any generating plant other than gas turbines to be built in response to a tender issued in response to the outcome of the security of supply assessment process. I believe that a period of at least six years is necessary.

A defined standard of security, coupled with the use of probabilistic modelling of both demand and generating plant performance, would enable the tendering authority to ascertain how much capacity of each of different types of plant would, in combination, allow the standard to be achieved. Furthermore, this methodology would allow the distinction to be clearly drawn between generation with a controllable

[1] Roughly speaking, under Average Cold Spell conditions, demand net of voltage reductions would be met in 96 winters out of 100.

energy source (e.g., nuclear, coal, gas, pond hydro), traditionally referred to as *firm* capacity, and that with an uncontrollable energy source (e.g., wind, wave, tidal stream, run-of-river hydro), traditionally *non-firm* capacity. The latter generation sources are producers of energy and cannot be despatched to meet peaks in demand; as such, they should be treated differently in the calculation of security of supply. I do not believe that the installed or sent-out capacity of such generation plant is relevant to the calculation of security of supply and it should not be eligible for capacity contracts. The actual metered output of such generation plant in each half-hour period should be deducted from the metered customer demand in that period (irrespective of the voltage at which the generating plants are connected to the network) to reveal the net generation requirement which the controllable energy source generation was required to meet. These net demand figures would be used to create the probability distributions used in the analysis of security of supply.

The probability distribution for this residual demand would thus have a lower median value and a larger standard deviation than that derived from conventional customer demand forecasts. This correctly represents the fact that the residual demand reflects both the underlying variation of customer demand and the variation of uncontrollable energy source generation output. The probability distribution function of the controllable energy source generation would be determined by the tendering authority based on historic output and reliability data. The overlap of the two resulting probability distribution functions represents the risk of failure of supply and would, when judged against the specified standard, prompt the issue of a suitable tender for additional controllable energy source capacity. Only controllable energy source generation would be eligible for capacity tenders and payments. If it is desired to extend the capacity tender to the demand side, demand response which can be despatched in real time to the instruction of the system operator could be included. The concept of rewarding by capacity payments demand reductions achieved through energy efficiency is, in my view, flawed. The proper, and only, reward for such reductions should be the saving in energy and carbon costs.

[redacted]
2 March 2011