

Ms Frances Warburton

Energy Systems
Ofgem
9 Millbank
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September 23rd 2016

Dear Ms Warburton,

This letter is in response to Ofgem's Open Letter dated 29th July.¹

Octopus, on behalf of its investors, has invested £2bn into renewable energy generation and associated technology over the last six years. We currently manage a total of 1.3 GW of renewable capacity in the UK, mainly in solar but also including biomass, wind, landfill gas and AD.

However over the last two years we have also been developing flexible gas (reserve power) generation plants that complement renewables by being able to mitigate intermittency, responding quickly when the system is short of power. We currently have invested c.£0.2bn into reserve power with over 250 MW either in operation or under construction. It is very important for Ofgem to note that this is not diesel generation but highly efficient, new gas reciprocating technology that has efficiency levels above both the oldest CCGTs and CCGTs that have converted to OCGT.

As we outline in this response we are deeply concerned about Ofgem's proposals as we believe that there has been insufficient consideration of the future of the UK's power generation fleet and a presumption that new large gas capacity is the required solution to the current low capacity margins. Further, Ofgem in its letter indicates that it is under the impression that thermal embedded generation (peaking plant) is responsible for the challenges currently facing CCGTs. It is Octopus's contention that the impact of embedded generation is actually marginal in this regard and the primary reason CCGTs are no longer economic in many cases is due to the expansion of renewables (supported by government decarbonisation policy incentives) and the future required generation mix in the UK is fundamentally different to the historic approach.

For clarity, from Octopus's perspective the most appropriate embedded thermal plant is new gas-fired technology which has the highest efficiency. The currently proposed implementation of the MCPD should act to limit the amount of less efficient diesel generation in future so we do not anticipate that much additional diesel plant will be built, which from our perspective is the correct market outcome. Therefore when we discuss new embedded generation in this response it is with reference to gas reciprocating engines alone.

Accompanying this response is an independent report from consultants Enapps who have analysed the running hours of different plants, their relative efficiencies, and the future UK capacity requirements as forecast by National Grid. Their conclusion from this is that there is only limited requirement for large gas plant in the future and the most efficient way to meet the UK's energy needs of the future is flexible distributed gas plants which therefore need to be adequately incentivised.

¹ Ofgem, Open Letter: Charging arrangements for embedded generation, 29 July 2016

Ofgem's Identified Detriment from TRIADs and Embedded Generation

In section 3.1 of the Open Letter Ofgem identifies a number of ways in which TRIADs act to the detriment of the UK power market. We have a number of concerns about this rationale for changing TRIADs as detailed below.

- *Inefficient generation mix:* the letter states that TRIADs incentivise smaller embedded plant over larger "potentially more efficient" gas plant. We do not disagree that CCGTs can be more efficient than small flexible gas plant but only when they are running at full capacity as baseload. As Enappsys detail the opportunities for this extended running are rapidly diminishing as a result of the build-out of renewable capacity (and expressly not due to the expansion of peaking plant). Only the newest CCGTs have a significantly higher efficiency level than gas reciprocating technology (and only on long baseload running); older CCGTs have broadly the same efficiency as gas reciprocating engines, especially on shorter running operation, and both the oldest CCGTs and CCGTs converted to OCGTs have lower efficiency, markedly in the latter case.
- *Changing UK energy requirements:* the future energy mix of the UK requires flexibility and not large transmission-connected plant as intermittent renewables form the core of power generation, along with nuclear in the baseload. Enappsys have analysed National Grid's Future Energy Scenarios and have identified that in only one, the "No Progression 2040" scenario is there any requirement for baseload outside of nuclear by 2040. In all other scenarios there is no need for large gas plant to run for long periods. Therefore rather than embedded benefits and TRIADs incentivising inefficient entry they are actually encouraging exactly the form of generation capacity that is required for the future.
- *Minimal additional capacity impact from new CCGTs:* the Enappsys report also highlights that due to the low levels of baseload running now available new CCGTs do not necessarily add to the UK generation capacity but instead displace older less efficient large plant. There is intense competition for the baseload running that exists and new CCGTs, being more efficient than old stations, are able to outcompete older plant. This older plant will either convert to peak running but at much lower efficiency levels than dedicated gas peaking plant, or will close and exit. Hence new CCGTs will not substantially increase the UK generation capacity when it is most needed which is in the peak periods.
- *Consumer impact of removing TRIADs:* contrary to Ofgem's assertion, removing TRIADs could in fact increase the costs to consumers. Whilst TRIADs are a cost to consumers, the alternative will also increase costs. At present 6-10 GW of embedded capacity enters the market across around the 50 highest demand half-hour periods in the Winter. As Ofgem highlights this serves to dampen peak prices, which is to the benefit of consumers. In the absence of TRIADs a substantial proportion of this 6-10 GW will not generate in the peak Winter periods and system prices will rise. Overall costs will increase more than system prices because National Grid will need to call on balancing services (SBR, BM and STOR) in order to balance the system, exacerbating the consumer impact. In addition attempting to increase the CM price through manipulating embedded benefits is a highly inefficient market intervention because it is completely untargeted. All existing CMUs will benefit from higher CM prices rather than just the new capacity Ofgem is (in our view, erroneously) attempting to incentivise. This will form a windfall gain for the big 6 generators in particular while embedded benefits are focused on the flexible capacity the market now needs, and leaving the market to determine the CM price results in a lower CM cost for consumers. Octopus is struggling to understand how Ofgem, with its remit to protect consumers, is potentially enacting change that will increase peak system prices and provide windfall gains to legacy, probably fully depreciated, plant creating substantial additional costs that will inevitably feed through to higher consumer prices
- *Adverse market impact of embedded generation:* Ofgem identifies that embedded generation both systematically dispatches "out of merit" and undermines the economics of large gas plant. Neither of

these statements are wholly correct. It is very rare that during the Winter peak gas-fired flexible plant dispatches out of merit – this would only occur if there was unexpectedly high wind in a period that had previously been expected to be a high demand period. Otherwise flexible gas plants can run profitably in the evening peak throughout the Winter. Diesel plants do dispatch out of merit to chase TRIADs but as above this serves as a benefit to the system by providing capacity at a much lower cost than would be achieved from the alternative of utilising balancing services. In terms of the impact that embedded generation has on the economics of CCGTs, this is minimal compared to the substantial impact of renewables. Enappsys identify very clearly that the rapid expansion of renewables, in line with the government decarbonisation strategy, has fundamentally changed the load shape for large gas generation, rendering many plants marginally economic. The challenges of CCGTs are a symptom of the policy-driven changes in the UK market, not the result of some form of market failure induced by embedded benefits

Octopus's View on the TRIAD Review

As outlined above renewables are now a permanent feature of the UK's power generation mix and the market is at a point of inflexion, changing from preponderantly large transmission-connected generation to a core baseload supply and the balance of generation coming from a diverse distributed mix of renewables, flexible plant and new technologies. It is vital that these trends are understood in order to avoid inefficient outcomes from any regulatory intervention.

Octopus has recognised these trends and is committing both its own balance sheet and investors' capital to support the new UK power landscape and build the next generation energy business. We have over 1 GW of installed solar and 1.3 GW of renewable capacity in total, along with over 250 MW of gas-fired reserve power plant (reciprocating engines), and we continue to expand this capacity across renewables and peaking plant, subject to regulatory intervention. Further, Octopus has recently acquired a majority stake in a provider owning an advanced demand-side management system that enables internet-based control of energy consuming equipment so that an aggregation of micro-turndown capacity can deliver meaningful levels of demand side response capacity. In addition we have a rapidly growing energy supply business which means that we are very concerned that policy prescriptions support our efforts to deliver least cost energy to hard-pressed consumers.

Our view of the TRIAD consultation is that it is critical that Ofgem fully understands the rapidly changing UK power environment before making a change to one element of the system. The impact of a removal of TRIADs on pricing and behaviour is extremely difficult to predict and we believe that it could have substantially detrimental, and unpredictable, impacts on the UK power price. For this reason we have been, and continue to be, highly supportive a Significant Code Review and are most disappointed that Ofgem has not pursued this route.

If Ofgem is committed to making a change to TRIADs we believe that an extension of the number of TRIAD periods would be the most appropriate solution. In other words TRIADs are split into 50 or more periods rather than the current three. This would mean that only the most economic flexible generation would be able to participate, incentivising this efficient generation while retaining the positive benefit to consumers of large amounts of additional capacity being available at the peak periods, delivering security of supply and avoiding high price spikes.

Increasing the number of periods over which TRIADs are earned would reduce the amount of capacity that would earn them and thereby reduce the costs to consumers. This is also a measure that could be introduced very quickly.

We have seen some of the proposals being considered by the CUSC panel and note that there are several that propose a cap to the TRIAD price level. We do not have a view on the level at which prices should be

capped but consider that Ofgem should consider all the costs avoided through the TRIAD incentive effects. In particular this includes the avoidance of high CM prices, which could be very substantial if existing plant is over-rewarded on an ongoing basis, and the benefits of peak price reductions, as compared to the high system prices and costs of balancing actions that will be required in the absence of TRIADs. We do not believe that any long term price should be below the current TRIAD level (with appropriate future indexation) in order to avoid concerns over retrospective changes to the investment environment.

Overall we are firmly of the view that Ofgem should be mindful of the rapidly changing UK power market in reaching its conclusion on TRIADs and ensure that any action it undertakes is designed for future requirements rather than perpetuating the approach of the past that is rapidly being swept away.

Yours sincerely



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