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Sent by email: **soincentives@uk.ngrid.com**

Date: 22/12/2010

Dear Mark,

RenewableUK consultation response
System Operator (SO) Incentives from 1st April 2011

RenewableUK (formerly the British Wind Energy Association (BWEA)) is the trade and professional body for the UK wind and marine renewables industries. Formed in 1978, and with over 660 corporate members, RenewableUK is the leading renewable energy trade association in the UK, representing the large majority of the UK's wind, wave, and tidal energy companies.

Overview:

(1) Until more evidence is provided to adequately demonstrate the need for an incentive extension, and to clarify the functioning of all energy modelling in sufficient detail, we recommend any extension, or major overhaul, of SO incentive should be postponed until at least April 2012.

(2) We recommend that current proposals to not sufficiently incorporate the new regulatory framework of RIIO, and lack sufficient consistency with RIIO-T1 proposals (e.g. the Low Carbon Economy Incentive) to deliver high level objectives. We believe to need to reflect the new regulatory framework within SO incentives in a timely manner should support the postponement of any SO extension, or overhaul, until at least April 2012 so to facilitate full consistency with RIIO-T1 decisions due to be published in March 2011.

(3) We are very concerned by National Grid inaccurately descriptions of wind energy as “inflexible” generation. Wind energy is one of the most flexible generation types connected to the GB system. Single units, or indeed groups of single units, can be controlled to ramp down from full output to zero output within 4 seconds, before then ramping back up to full output 4

seconds after that. This technical capability can be provided as “footroom” services, is full acknowledged by National Grid engineers, and should be clarified as such within future SO energy modelling and processes.

(4) We are very concerned over new National Grid proposals to create a “reserve for wind” policy. We recommend this proposal and its rationale is insufficiently evidenced. Without the provision and peer review of supporting evidence we would recommend current proposals are discriminatory, and should be removed from proposed SO energy modelling for implementation in 2011.

(5) In our response we have highlighted a number of questions, and concerns, regarding the treatment of variable generation output by the SO processes and energy modelling which support the newly proposed incentive measure. We have highlighted particular concern regarding the interaction between the SO and (a) wind forecasting practices, (b) Supplier generation portfolio management, (c) STORR energy modelling and related contracting processes, and (d) the newly proposed “reserve for wind” policy. We recommend National Grid setup an industry expert group through which to syndicate further detail and fully engage with industry on related proposals prior to the implementation of current proposals.

Specifics:

1. Insufficient evidence to support incentive extension

We would welcome the extension of the SO incentive length from 1 to 2 years on the basis that sufficient evidence is provided to demonstrate such an extension was necessary, or beneficial. For example, this evidence could demonstrate a 1 year incentive length currently limits the SO’s ability to confidently invest in innovative solutions capable of driving cost efficiency savings whilst maintaining security of supplies. However we note time limited incentives for TOs, DNOs, and other regulated monopoly network service providers has not historically prevented medium or even long term investments from taking place. In this instance we do not believe National Grid have provided sufficient evidence which demonstrates the need to extend the length of the SO incentive at this time. Consequently we recommend any extension is postponed by at least 1 year such that related evidence is collated and provided for further consideration by industry.

2. Insufficient incorporation of new regulatory framework - RIIO

We recognise the regulatory framework has recently changed from RPI-X to become RIIO, with Ofgem publishing the RIIO decision document midway through the review of SO incentives. The timing of this regulatory transition may explain why the proposed SO incentive

structure has insufficiently taken account of RIIO and its overall objectives. Whilst we recognise Ofgem and National Grid have previously recommended that there should be consistency between RIIO, RIIO-T1 and SO incentives, we view the current SO incentive proposals do not achieve the necessary level of consistency, and do not go far enough in supporting RIIO's primary objective to deliver the low carbon economy in a value for money manner. We note the RIIO-T1 decision paper will be published in March 2011. Whilst we accept March may be a little late for such decision to be incorporated within the SO incentive structure for implementation by April 2011, we recommend this is another reason why any extension of the SO incentive should be postponed by at least 1 year. In doing so, the time taken for the SO incentives to be modernised in line with the new regulatory framework of RIIO will be minimised, and could provide significant benefits to the wider energy sector as a result.

We note Ofgem's RIIO-T1 consultation is currently open, and includes reference to the Low Carbon Economy Incentive, as a central mechanism which could support the deliver of the high level RIIO objectives. We would recommend National Grid and Ofgem consider the inclusion of such an incentive for application as part of the SO incentive.

3. Stakeholder engagement and consultation process

We note that the level of industry engagement by National Grid throughout the recent review of SO incentives has been somewhat less than adequate, and certainly less than in previous years. Given the level of change National Grid are proposing for industry and regulatory support we would have expected engagement to fuller, deeper, and to have taken place at regular intervals from the outset of the review process. Whilst we welcome the provision of a workshop by National Grid midway through the consultation period, we note details of the constraint modelling were released for industry consideration at a very late stage in the review process and only after this workshop. Furthermore, we are concerned at the lack of detail provided in regard to the various energy models. The consultation does not currently provide the level of detail that is necessary for industry to perform a thorough impact assessment for new proposals. For example, the underlying calculations or rationale for the energy models are not sufficiently provided.

Given the complexity involved in some of the modelling, and the potential impacts of such modelling, we would recommend a dedicated industry expert group is setup to ensure the details of the energy models are adequately syndicated, worked through, and sufficiently evidenced. In some case we recommend that the proposed energy models should not be progressed for implementation until more evidence to provided by National Grid to justify their creation, for example the Reserve for Wind Policy.

4. Further review of new energy modelling is necessary

We welcome the previous review by Ofgem of National Grid's historic energy models, and in particular subsequent work on constraints modelling. However we would question what level of detail these review went into regarding other reserve options. For example, to what extent did National Grid or Ofgem consider the economic cost benefit of improved wind generation forecasting? To what extent do current STORR energy modelling techniques take account of Supplier generation portfolio management?

We recommend that significant levels of follow up work will be required to ensure reserve and response requirement relating to variable generation is accurately and appropriately modelled. RenewableUK is willing to participate in a related industry working group to review reserve and response requirements in the context of handling variable generation within GB energy system over the next SO incentive price control period.

5. Identifying efficiency improvements - Detailed cost benefit analysis on reserve and response service

We request clarification from National Grid on the associated costs and level of investment made in delivering Plexos. We would also request details of the cost benefit analysis supporting the reform of past practice regarding constraint modelling. We would question at what level of net economic benefit does the reform and revision of current processes become worth pursuing? With this in mind, it may or may not be the case that other areas of SO energy modelling may merit significant overhaul and investment in new practice, for example in wind output forecasting practices.

6. SO assessment of Supplier generation portfolio management, and related Balancing Mechanism activities

We welcome National Grid acknowledgement that improved forecasting of generation output parameters can reduce costs on consumers by reducing reserve or response requirements. Furthermore we welcome the National Grid acknowledgement in Paragraph 76 that generation portfolio management by Suppliers can help reduce the need for reserve/response holding by the SO.

We would recommend that should all Suppliers perform perfect balancing (per GSP group, per every HH trading period), i.e. 100% accurate balancing between the contracted generation supply and customer demand, then the role of SO would be much simplified. Indeed, it could be argued that within such a scenario the SO would require reserve and response only to address system constraint imbalance.

With this notion in mind, we recognise Suppliers are currently encouraged, via Cashout processes, to adequately manage their generation/demand portfolio to deliver minimal system imbalance. We would question to what extent the SO currently accounts for Supplier balancing activities within normal operating practice? To what extent does the SO reduce, or increase, contracted reserve and response services on account of Supplier portfolio management activities? What evidence is there that the ability of Suppliers to manage their portfolios, and provide balanced market positions, is worse at high wind periods compared to low wind periods?

Indeed we would suggest current balancing arrangements encourage Suppliers to take long rather than short market positions, and therefore very commonly over contract generation for any given HH period. This practice would potentially negate a large proportion of otherwise expected requirement for the SO to activate contracted reserve services where the market is short. Regarding “headroom”, we would question to what extent the SO accounts for Balancing Mechanism activities by Suppliers regarding portfolio management. We note this often delivers positive NIV positions and thus provides the SO with "free" headroom within which to provide reserve/response services. In National Grid’s view, to what extent is this practice regular, predictable, and accounted for in contracting reserve and response services?

7. Wind energy is flexible

With regard to Paragraph 84, 249, and 266, we are very concerned that National Grid as the GB SO should suggest that wind energy is “inflexible”, and therefore not technically capable of providing “footroom” services. At the WANO Workshop in October of 2010, National Grid Engineer Helge Urdal accurately stated Wind generators to be one of the most flexible generation type connected to GB system, in that a wind turbine (or a group of wind generators) can be controlled to reduce from full output to zero output within less than 4 seconds, and subsequently ramp up to full output 4 seconds after that. Such response can be provided on request, and is something other technologies cannot do. We would strongly recommend National Grid revisit their definition for “inflexible” plant, and clarify that wind generators are technically capable of providing related response services.

8. Separating distinct SO challenges

Paragraph 96 overly confuses, or attempt to merge, two very different issues in the shape of the predictability of wind output, and constraints. We recommend National Grid, and the SO, clearly differentiate between these two very separate issues, which promote separate challenges and related activity on the part of the SO.

9. Volatility of wind generation output is low compared to demand

Paragraph 96 implies wind generation to be volatile. We would recommend that as clarified by National Grid in their "Operating in 2020" publication, even with 30GW of wind (far more than is currently operational), anticipated rates of change in output of wind would approximate to that handled by the SO every day in managing demand fluctuations. Furthermore, intra second volatility of wind output is currently relatively insignificant in comparison to equivalent fluctuation in demand.

10. Forecasting wind energy output – predictability within intra day, intra hour timescales

We would recommend this consultation has not given sufficient clarity to the timescale requirements currently made on wind forecasting in order to adequately contract related reserve and response services. Given wind outputs can be accurately predicted intra day, with accuracy improving with closer proximity to real time, we would request National Grid provide more information on when, and how, wind forecasting interlinks with reserve/response service provision.

Where it is possible to re-organise the timescale for contracting response/reserve services, we would seek analysis on the cost benefit analysis on shifting such contractions closer to the real time in order to benefit from improve wind forecast accuracy.

We would question why, in the table under Paragraph 129, National Grid defines their confidence in forecasting wind generation to be "low". It is not clear whether National Grid refer to intra day forecasting, which is highly predictable, or to longer term forecasting. Given intra day, and intra hour forecasting accuracy we would recommend the level of SO confidence to be increase to "medium".

11. Demand shifting, Demand side participation – future challenges

In Paragraph 99, National Grid considers demand as a distinct parameter. Whilst not expected in the short term, we recommend future demand trends may shift in line with market price signals, and therefore the output of low marginal cost generation such as wind. As demand side participation grows, its impacts will require increasing level of detailed consideration by the SO.

12. Assumptions underpinning STORR requirements

Paragraph 157 highlights a service criterion which defines the overall level of service provided by STORR such that demand is met by supply in all but 1 in 365 days per annum. We would

question what this criterion refers to? Does it cover 48 HH (consecutive, or separate?) periods per annum, or 1 HH period on one day per annum? What size of customer, or customer group, would need to experience a lack of supply for this parameter to be satisfied? We would question on what grounds has this criterion been developed? We recommend the publication of detailed reasoning and related evidence to support this criterion before it is progressed any further.

Furthermore, if it found that the GB system has not experienced a supply failure in line with the "1 in 365 days" criterion, what weight can be given to the argument that the SO is over contracting reserve and response service and thus providing an uneconomic service to the consumer? We would request National Grid provide details of how closely the GB system has satisfied this requirement in recent times?

We note that the equation Paragraph 159 states Margin to equate to sum of STORR and NIV less the Headroom. Is it not the case that Margin should equal the sum of all three of these components?

We are very concerned with NG future balancing requirement calculations, where wind power forecasting error ranges from 30-50%. We understand current average wind power forecasting error by the SO is approximately 15%. As such we would question why National Grid and uses such large error margins within their energy modelling? How does this National Grid performance on wind forecasting compare internationally? To SO performance in Spain, Ireland, or Denmark?

Furthermore, we are very concerned with the methodology applied by National Grid to future balancing requirements, for STORR in particular. It would appear that the current proposal assume maximum system wide wind power out in GB summertime will equate to 100% of capacity. In reality seasonal resource distribution for wind will render the maximum output to be far lower than 100%, probably no more than 70% at the most. Furthermore the average output will be far lower than in winter. Correspondingly, this methodology could be significantly over estimating the level of reserve required for the preservation of security of supply. We would again request detailed cost benefit analysis of the economic benefits gained from improved wind forecasting, and improved timing of service contraction by the SO.

13. "Reserve for wind policy" – What is the reasoning? Where is the evidence?

Regarding Paragraph 186 we would strongly question the provision of a "reserve wind policy", and the underlying assumption. We are very concerned that National Grid should propose such new development with the support of so little evidence. We would therefore request that National Grid provide supporting assumption and evidence before progression of such a

policy dedicated to one technology type. Without the provision and peer review of supporting evidence we would recommend current proposals are discriminatory, and should be removed from proposed SO modelling for implementation in 2011.

14. Large infeed loss risks – What are they? And where do they come from?

We recommend that National Grid energy modelling fully recognises that wind generators does not contribute to the additional need for reserve and response services necessary for catering for the instantaneous large loss of infeed. We note that in recent SQSS consultations, National Grid clarified that than any generation unit of less than 350MW of scale posed "no additional risk to system operation". Given that no UK connected wind energy generator exceeds 5MW, and no wind farm exceeds 350MW, it can be said that wind energy does not contribute to the requirement for the spinning reserve require to meet the large loss of infeed.

RenewableUK analysis of National Grid ROCOF[1] reporting shows that since May 1998 there have been 87 system incidents resulting in significant system frequency variance. Of all such incidents 74% were the result of Generators tripping, 25% were the result of Interconnectors tripping, and just 11% were the result of network failure or other system faults (See Figure 1).

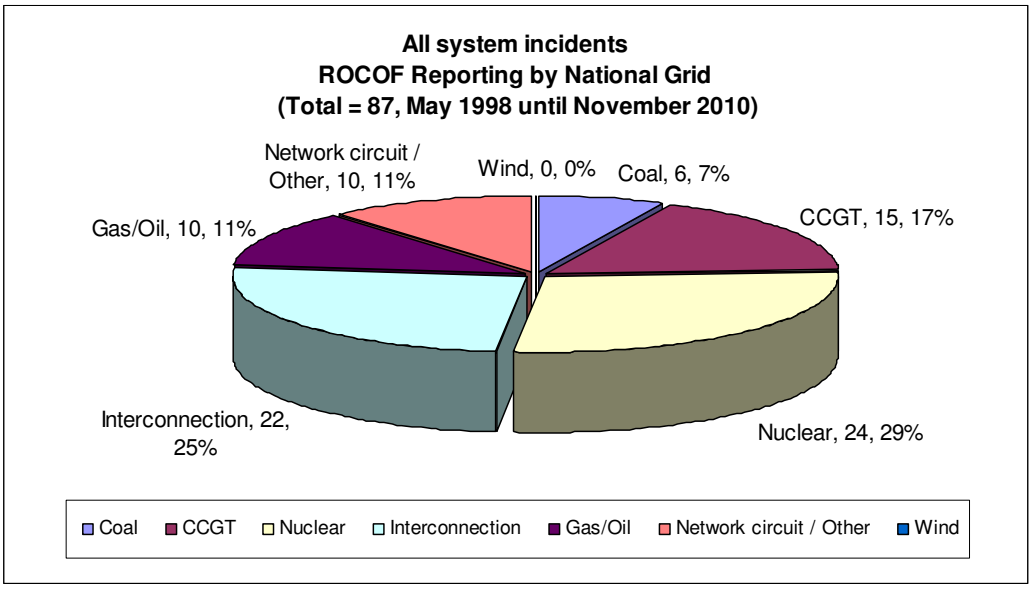


Figure 1: Interconnectors are the second highest contributor to system incidents.

The current SQSS large loss infeed limits attend to two categories of system incidents: (1) loss of generation due to a transmission network fault(s), (2) loss of connected generation infeed. We note that a category (2) fault could be provoked by either the loss of generation

[1] National Grid ROCOF reporting: http://www.nationalgrid.com/NR/rdonlyres/EE3D5746-4878-4D57-B1E3-8A68CE0A751F/43961/pp10_35SystemIncidentReportROCOF.pdf

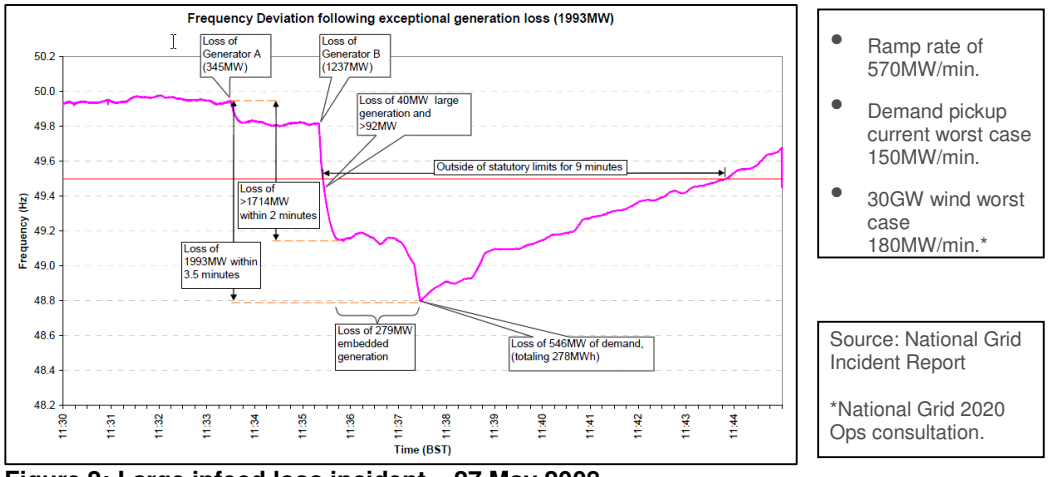
plant, or by loss collection circuitry connecting the generation plant to the transmission network.

Failure mode	Frequency of occurrence	Large single generator (e.g. 2 x 825MW unit)	Large group of small generators (e.g. 33 strings of 10 x 5MW units)
(1) Network circuit failure	Low	Large infeed loss - 1650 MW	Large infeed loss - 1650MW
(2a) Single generation unit	High	Infeed loss - 825 MW	**No additional risk - 5 MW**
(2b) Generation system	Medium	Large infeed loss - 1650 MW	**No additional risk - 50 MW**

Table 1: System impact risks posed by large single generator and large groups of smaller generators from network circuit failure, and generation failure.

We note there are a number of system benefits offered by wind energy through the use of multiple small generators as opposed to singular large units. Table 1 attempts to clarify how the risk of large loss infeed compares across these two approaches to generation setups and related scale of individual units.

We also note that with a large wind farm, a single turbine (e.g. 3MW of rate output) can shut down (through either high wind, or failure scenarios) without affecting the performance and output from the rest of the wind farm. We would like to clarify that even in the rare event of high wind storm periods where large proportion of the UK wind portfolio could be shut down due to excessive windspeeds, the rate of output variance will be very small compared to that of demand, and the instantaneous loss of large single generation plants. We note historic worst experienced events such as that experienced in Denmark in 2005 where a storm encouraged the shut down of approximately 2.5GW but over the lengthy period of 10 hours (4MW per minute).



- Ramp rate of 570MW/min.
- Demand pickup current worst case 150MW/min.
- 30GW wind worst case 180MW/min.*

Source: National Grid Incident Report

*National Grid 2020 Ops consultation.

Figure 2: Large infeed loss incident – 27 May 2008.

Similarly the rate of output variance from an equivalently scaled wind portfolio in typical operational conditions is relatively low when compared with daily demand increase rates of 150MW per minute during breakfast pickups.

National Grid have questioned the volatility of wind, but we would recommend the worth of comparing the volatility of wind, with the impacts posed through the loss of a single large generation unit. For example, consider the infeed loss incident of the 27 May 2008, see figure 3 below.

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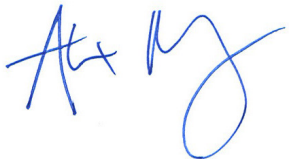
Yours sincerely,



Alex Murley, Head of Technical Affairs for RenewableUK