Promoting choice and value
for all gas and electricity customers

National Grid's Proposed New Balancing Services: Draft Impact Assessment

Consultation

Publication date: 22 November 2013

Response deadline: 6 December 2013

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Overview:

In our 2013 Electricity Capacity Assessment report we set out the risks to security of supply in Great Britain (GB) and the uncertainties around the outlook for both supply and demand. We do not think any disruptions to consumers' supply are likely, providing the industry manages the issue effectively. However as set out in our June 2013 consultation letter in the light of these uncertainties, the Department of Energy and Climate Change (DECC), National Grid Electricity Transmission plc (NGET) and Ofgem all agreed that it is prudent to consider the case for additional balancing services.

Following two rounds of consultation, NGET has made an application to the Gas and Electricity Markets Authority (the Authority) to introduce two new balancing services to support it in balancing the system from as early as winter 2014/15. The Authority must either accept or reject NGET's application. Using that application and publicly available information this draft impact assessment sets out the potential impacts of these new balancing services on competition and consumers.

We seek stakeholders' views on this assessment, so the Authority can take them into account in deciding whether to accept or reject NGET's application. The closing date for responses is **6 December 2013**.

Context

Our 2013 Electricity Capacity Assessment highlighted that the risks to security of supply are increasing faster over the next six winters than we previously expected. Even over the short term, the uncertainties around both supply and demand are significant. It is therefore difficult to assess accurately the level of security of supply the market will provide.

Ofgem's principal objective is to protect the interests of present and future consumers, which includes their interest in the security of supply of electricity to them. In accordance with this objective, Ofgem along with DECC and NGET considered it prudent to consider the case for NGET to procure additional balancing services given this uncertain security of supply outlook. Following two rounds of consultation NGET has made an application to introduce two new balancing services.

This draft impact assessment should be read alongside NGET's published documents. The purpose of this document is to describe the potential impacts of the introduction of these two new balancing services by NGET.

Associated documents

NGET's consultation on its Final Proposals: Consultation on Demand-Side Balancing Reserve and Supplemental Balancing Reserve

NGET's factsheet on new tools to balance the network

Ofgem's open letter on NGET's consultation on the new balancing services

Ofgem's Electricity Capacity Assessment Report 2013

London Economics: The Value of Lost Load (VoLL) for Electricity in Great Britain

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Executive Summary

National Grid Electricity Transmission plc (NGET) application to introduce two new balancing services

On 18 November 2013, NGET made an application to Ofgem to introduce two new balancing services to support it in balancing the system in the middle of the decade. The Authority must either accept or reject this application. NGET's application follows its 11 October formal consultation and the 26 June informal consultation on the design, procurement and use of these services and Ofgem's parallel publication of an open letter setting out the potential need for these services in light of the uncertainties around the mid-decade security of supply outlook.

Assessing the impacts of NGET's application

The purpose of this draft impact assessment is to assess the potential impacts of NGET's application. We set out a combination of qualitative and quantitative analysis, focussing on competition and consumers. There are limits to the quantitative analysis undertaken due to the time available and the information we have. We have however taken what we consider to be an appropriate and proportionate approach to help stakeholders consider the potential impacts and help them engage in this consultation.

There are both potential positive and negative impacts to competition arising from these new services. These include potential impacts on: wholesale market prices and plant profitability; on other balancing services and risk and unintended consequences. A key issue for the Authority in its assessment will be the degree to which features of NGET's application mitigate the potential negative impacts.

We estimate that buying these services could cost an average domestic consumer less than £1 a year and an average SME consumer around £7 a year while the impacts on industrial consumers' bills are likely to be higher as they tend to consume more electricity. These figures are only an approximation as actual costs would only be known after NGET has run a tender. We have not been able to model any dynamic cost impacts in the wider market. The figures only include the direct costs of purchasing the new balancing services. We have not been able to estimate the consequential impact these services might have on prices in the wholesale market.

The benefit to consumers is that these products would provide some insurance against involuntary disconnections and against having to pay the cost of other emergency actions. The value of this insurance depends on the probability of National Grid needing to take emergency actions. In short, the benefits are directly related to the loss of load expectation (LOLE). While it is not possible to assess LOLE accurately our 2013 Capacity Assessment suggests that the risks to security of supply are increasing and that there are credible outlooks where the mid-decade LOLE might exceed an acceptable level of risk, such as that established by DECC's draft reliability standard.

Overall we consider the trade-off between costs and benefits is likely to be finely balanced.

Next steps

We seek stakeholders' views on this assessment, so the Authority can take them into account in deciding whether to accept or reject NGET's application. We will publish a final impact assessment alongside the Authority's decision in late December 2013.

1. Introduction

1.1. Ofgem's principal objective is to protect the interests of present and future energy consumers, which includes their interests in future security and sustainability of energy and value for money.

1.2. Ofgem must deliver an Electricity Capacity Assessment report to the Secretary of State for the Department of Energy and Climate Change every year[1]. Our last report estimated a set of electricity de-rated capacity margins for the winters from 2013/14 to 2018/19 and the risks associated with them. Our Capacity Assessment showed that margins are falling faster than we had expected when we undertook our Capacity Assessment in 2012. It also highlighted the high level of uncertainty over the outlook, and the fact that risks to security of supply are asymmetric.

1.3. In light of the uncertainties around the outlook for both supply and demand of electricity Ofgem, DECC and NGET agreed it was prudent to consider the case for NGET procuring additional balancing services that could be used in the mid-decade winters in order to assist it in balancing the system.

1.4. According to its transmission licence, NGET cannot procure any new balancing services without the Authority's approval for modifications to its Balancing Services Procurement Guidelines and other associated documents, such as the C16 documents. Where NGET wants to be able to procure any new kind of balancing services, it must first propose amendments to the C16 Documents to include those new balancing services, consult on these, and receive the approval of the Authority for those amendments.

1.5. Following two rounds of consultation on the final design, procurement and use of two potential new balancing services developed to help balance the electricity transmission system from as early as 2014/15, NGET applied to the Authority for approval on 18 November 2013. The Authority therefore now has to decide whether to approve the proposed services and consequent amendments to the C16 Documents enabling NGET to procure either or both of the additional services and must reach its decision by 16 December 2013.[2] In this process the Authority does not have the power to substitute any part of the application with an alternative of its own. Therefore we compare NGET's application against the *status quo*, that is, the services currently in place.

[1] As required by s. 47ZA of the Electricity Act 1989 (EA89)
[2] Under standard condition C16(8)(b) of NGET's electricity transmission licence, the Authority has 28 days from receipt of NGET's proposed amendments to the C16 documents (which are required to enable NGET to procure the new services) to decide whether to approve or reject them.

1.6. We acknowledge that other options could still be open to Ofgem and/or NGET outside this framework, but would require separate processes which are not within the scope of the Authority's current decision and thus also not within the scope of this impact assessment.

The Purpose of this draft impact assessment

1.7. In light of queries raised by some respondents to NGET's consultation in relation to the potential impacts of these services, we think it would be appropriate to carry out a draft impact assessment of the potential impacts of NGET's application.

1.8. As set out above, this draft impact assessment examines NGET's application rather than proposals designed and raised by Ofgem. This application has been the subject of a prior consultation process conducted by NGET. As such in our view, an appropriate and proportionate approach is for us to use primarily data and information provided in NGET's application, along with our own qualitative analysis and some information from other published sources to assess the impact of the proposed services, including whether they meet the criteria we set out in our June open letter. These are:

a) NGET's procurement must be economic and efficient and the services must represent value for money to electricity consumers;

b) NGET's design and proposed use of the new services must minimise unintended consequences to market participants and the operation of the market; and

c) NGET's procurement process must be objective and transparent.

1.9. We seek stakeholders' views on this assessment, so the Authority can take them into account in deciding whether to accept or reject NGET's application. The closing date for responses is **6 December 2013**. Contact details are included in Appendix 1. We will publish a final impact assessment alongside the Authority's decision in late December 2013.

2. NGET's proposed new services

2.1. On 18 November NGET made an application to Ofgem to introduce two new balancing services; Supplemental Balancing Reserve (SBR) and Demand Side Balancing Reserve (DSBR). Below we summarise the key characteristics of NGET's application. Further details are available in NGET's June and October 2013 consultation documents.

2.2. NGET proposes that, in principle, it would only dispatch these services after other feasible options in the balancing mechanism have been exhausted. NGET expects to despatch DSBR ahead of SBR, with SBR used only as a last resort.

Supplemental Balancing Reserve

2.3. NGET have designed the SBR service with the intention of targeting generation that would otherwise not participate in the market. However, NGET would not require interested providers to demonstrate that the plant would not be in the market absent the new service. However, successful SBR plant could not generate electricity in the market or provide other balancing services for the entire duration of its contract.

2.4. Generators would need to make SBR available from 6am to 8pm on non-holiday weekdays in the months of November through to February. Each SBR unit would be tested on a monthly basis. The suppliers of SBR would receive their tendered rate for the volume made available and be paid at the tendered rates for proving tests, utilisation and warming. They would incur non-delivery charges calculated depending on the difference between declared and actual reliability of their SBR units.

2.5. If NGET sees a need to procure SBR it currently intends to publish the quantity required ahead of tendering. Tenders would be accepted to achieve the required quantity of SBR at least cost. The cost of each contract would depend on the tendered quantity and price, expected costs of testing, warming and utilisation as well as the expected costs of validation, contracting, settlement and despatch.[3]

[3] NGET proposes that if in order to meet an anticipated need for SBR, slow SBR dynamics require it to be despatched ahead of need, but NGET's intention is to minimise any such despatch.

Demand Side Balancing Reserve

2.6. DSBR is a demand-side service that offers non-domestic consumers payments to reduce their demand when the system is tight.[4] In principle, NGET will dispatch this service after exhausting all feasible balancing mechanism actions and before despatching the SBR.

2.7. DSBR providers would need to have the ability to reduce demand for at least one hour, if instructed by NGET, at any time in the period between 4pm and 8pm on non-holiday weekdays in the months November to February by i) reducing or shifting demand, ii) increasing 'behind-the-meter' generation, or iii) by small embedded generation or storage booked against the given a supplier's consumption account.

2.8. Under the applications a DSBR provider would receive a utilisation fee for demand reduction despatched and delivered according to the utilisation rate it tendered for. Providers of DSBR would also opt to receive a set-up fee of £10/kW for a reduction that can be provided for at least two hours (and pro-rated for shorter periods). The tendered volumes would be bought and used in ascending cost order, cheapest first considering the declared capability, set-up fee, utilisation rate and a reliability factor to rank bids.

2.9. If NGET identifies a requirement for DSBR in either of the winters of 2014/15 and/or 2015/16, it proposes to tender in the spring preceding that winter. NGET currently envisages publishing the required volume ahead of the tender process.

Other amendments to NGET's previous consultations

2.10. NGET proposes that a review is undertaken in 2016 whether either service should be removed, modified or retained.

2.11. To determine the volume of balancing services required, NGET would develop a methodology drawing on published information in Ofgem's Capacity Assessment Reports, its own Winter Outlook Report and Future Energy Scenarios, together with any other relevant information relating to generation availability and trends in demand. Based on this information NGET proposes to develop a number of equally likely supply and demand scenarios for each winter from which they would derive a distribution of the range of generation margins.[5] NGET would set the volume it seeks to procure based on an assessment of the likely range of margins and the Government's draft reliability standard or final reliability standard when it becomes available.

[4] Consumers could also offer DSBR services through suppliers or agents, such as aggregators.
[5] Measured in Loss of Load Expectation (LoLE) in line with DECC publications on the draft reliability standard.

2.12. NGET has suggested that the total volume of new balancing services it can procure could be capped through the funding arrangements and suggest setting this cap at 5% of the peak demand in the average cold spell.

2.13. NGET also considers that it could establish bespoke metering/baselineing arrangement for potential DSBR provider's at large, complex sites if it were feasible and economic. Moreover, it no longer proposes to require a Board of Directors declaration that plant bidding for an SBR contract would not otherwise be available in the electricity market.

3. Our assessment of potential impacts

3.1. This chapter assesses the potential impacts of NGET application to introduce two new balancing services on competition and consumers. Given the intangible nature of many of these impacts we feel a qualitative assessment is most appropriate, supported by quantitative evidence where possible, mainly drawing on figures from NGET's application. For the purposes of this analysis, unless otherwise stated, we analyse the effects of both products together.

Impacts on competition

Supplemental Balancing Reserve

3.2. It is possible that the SBR service may have an impact on prices in the electricity wholesale market, which could distort competition in both the short term and medium term.

3.3. Firstly, because NGET currently anticipates buying SBR products for one or two years only, it is possible that after this period, the plant winning those contracts may make a decision to return to the wholesale market. As the SBR plant has received additional payments as additional balancing products, their re-entry could result in lower prices – either at some point in the future if this effect is unexpected, or on the forward curve if industry anticipates this effect. This could affect the profitability of other plant in the wholesale market, and therefore distort competition. However, there are factors that help mitigate this risk. NGET states their intention is to procure SBR services from plant which would otherwise leave the market. It can be argued that it would be very unlikely for such plant to want to return to the market in the future, particularly if, as might be expected, overall market prices fall following the introduction of the DECC's Capacity Market.

3.4. Secondly, we note it is possible that plant may win a SBR contract which *would* otherwise have stayed in the wholesale market. If this were to happen, margins in the wholesale market would fall, resulting in higher prices. This could be seen as a positive effect as those higher prices might help prevent further mothballing or even attract plant that is currently mothballed to return to the market, but it will nonetheless have an impact on competition compared to the *status quo*. We note that NGET proposes a review of the SBR service in 2016.

3.5. Thirdly, some industry participants have raised concerns that the SBR could have a negative impact on prices and profits of plant in the wholesale market in the short term, and therefore affect competition. They argue that when SBR plant is dispatched, it will to some extent "replace" MW that other plant would otherwise have sold. NGET's application to despatch the SBR plant as a "last resort" after all other balancing mechanism options have been taken and before initiating emergency actions will reduce this risk significantly.

However, this effect cannot be completely eliminated to the extent that, for example, NGET will need to test the plant. We note that it would be important for NGET to take this issue into account when considering how it conducts testing.

3.6. It is possible that NGET procuring SBR may also affect competition and increase the prices of the other balancing services. For example, there may be some overlap between plant bidding for STOR contracts, and those considering bidding for SBR contracts. If some plant move out of STOR and into SBR, prices for STOR may rise. However, we note there are differences between the technical requirements of the two balancing services.

Demand Side Balancing Reserve

3.7. We consider that the DSBR could have effects on competition for other demand side services. For example, by creating a "new" service, it is possible that NGET may inadvertently reduce the number of parties willing to provide other demand side services such as triad avoidance. However, we note that NGET is seeking to guard against this by allowing demand side providers to potentially participate in both services.

3.8. During consultation with industry some parties highlighted to NGET the risk that the DSBR could "crowd out" other demand side products or initiatives, and could create confusion with DECC's proposed Capacity Market transitional arrangements. We acknowledge this risk.

3.9. It is also possible that to the extent the DSBR is successful in generating extra interest and awareness in the provision of demand side products, and allows both NGET and the market to further "learn by doing", it could stimulate greater participation of large users in the broader demand side services, such as the Capacity Market, in the longer term.

Risks and unintended consequences

3.10. We note that there are some potential risks and unintended consequences associated with NGET's SBR and DSBR services. The proposed new balancing services are different to the other balancing services NGET currently procures, such as STOR. NGET's decision to procure these services is much more closely linked to de-rated margins in the wholesale market (or expected LOLE excluding these services). The actions of generators in particular – for example in deciding whether to announce they intend to mothball a plant or not – could have an impact on NGET's procurement decisions. There is therefore at least a theoretical risk that plant could seek to provide the SBR product for strategic reasons. For example, a plant might announce it intends to mothball, hoping to trigger a further round of SBR procurement, in the hope of gaining an SBR contract out of the process. Were this to happen, there is a risk of a "flight" of plant out of the wholesale market causing headline margins to fall, LOLE to increase and the size of the SBR to grow significantly.

3.11. We see a number of mitigations against this risk. Firstly, NGET's intention to nominate a volume cap helps reduce the risk that the SBR could grow beyond the levels originally intended. Secondly, we note that NGET is currently focussing on purchasing SBR for the two mid decade years only. Thirdly, if there is effective competition in the markets for SBR and DSBR services together, the gaming strategy described above could be a risky one, and therefore less attractive. Finally, we note that NGET proposes to review the SBR and DSBR arrangements in 2016 before making any decision to procure these services beyond that date.

3.12. If the introducing of the DSBR leads to further development of the demand side it may weaken the existing investment incentives in generation. However, increased flexibility of demand side response is likely to be beneficial to consumers particularly during peak periods or at times in the future when the system is capacity constrained due to low wind generation output. The potential stimulation of the demand side could also increase competition in its wider sense.

3.13. Lastly, we note that because the DSBR is new, it is hard to know how reliable it will be. NGET is proposing to guard against this risk by assuming in its volume calculations that only 75 per cent of DSBR service providers are able to respond. Clearly experience would allow NGET to develop an understanding of the reliability of this tool, both in terms of how much responds and how quickly it responds.

Impacts on consumers

Benefits to consumers

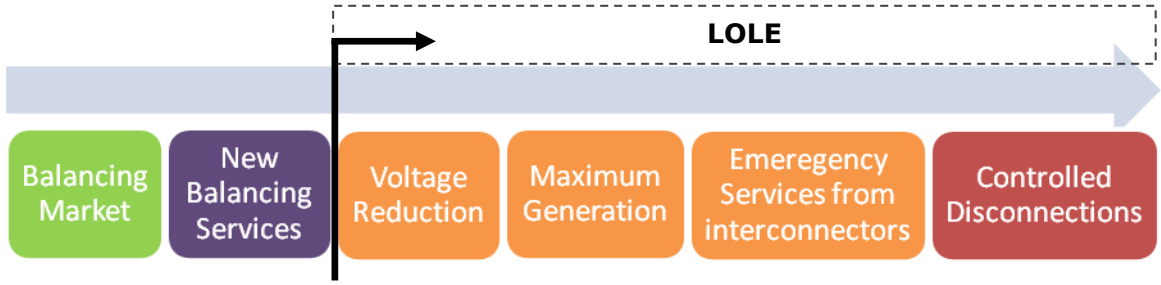
3.14. In this section we discuss the value to consumers of avoiding emergency actions. We then quantify the benefits of increased security of supply. We use two methods and display a range of possible values for each based on three sensitivities from Ofgem's 2013 Capacity Assessment.[6]

Avoided Cost of Emergency Actions

3.15. The primary benefit of new balancing services would be to avoid the costs of emergency actions, which are available to NGET, as the system operator, when supply does not meet demand. The range of options is set out in figure 3.1 below including where the despatch of both new services would occur.

[6] https://www.ofgem.gov.uk/ofgem-publications/75232/electricity-capacity-assessment-report-2013.pdf

Figure 3.1: Diagram of NGET's options to balance the electricity system



3.16. Figure 3.1 shows that only after all other emergency actions (orange boxes) have been exhausted would controlled disconnections occur (red box).[7] In such a situation NGET would ask its non-embedded customers and Distribution Network Operators (DNOs) to reduce demand.[8] Controlled disconnections do not necessarily equate to blackouts for all customers. However, non-embedded customers are more likely to be disconnected due to their higher consumption and connection to either the transmission or distribution network. The impact on households is further mitigated as DNOs have discretion on how to reduce demand and are likely to use rota disconnections, minimising the time any one group of customers would be without power.

3.17. We have limited information on the cost of emergency actions and the number of case studies in this area is small.

3.18. Ofgem and DECC jointly commissioned a report from London Economics[9], which sought to quantify the cost placed on brownouts[10] and blackouts[11] for different groups of consumers. This was published in July 2013 and will be used to assist DECC in setting a reliability standard for GB and separately by Ofgem as part of its Electricity Balancing Significant Code Review (EBSCR). There is no true single value of lost load, as it can vary based on the time of the day and year reflecting individual consumers' preferences and differs between brownouts (voltage reduction) and blackouts. Therefore any figure is only ever indicative, and usually an average of several other values.

[7] Controlled disconnections are one type of emergency action available to NGET and are typically used as a last resort to maintain a balance between supply and demand.
[8] DNOs would then either instruct their non-embedded customers to reduce demand or reduce demand at supply points on their networks.
[9] The Value of Lost Load for Electricity in Great Britain: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/224028/value_lost_load_electricty_gb.pdf
[10] Brownouts refer to a drop in voltage on the electricity system
[11] Blackouts refer to the controlled disconnection of electricity customers

3.19. We note that London Economics found it very difficult to determine a value for brownouts, as the costs are often intangible or unknown. This prevents using a questionnaire approach, which they were able to do for blackouts.

3.20. A proxy for the value of "brownouts" to domestic consumers is the cost of reduction in lifetime of electrical appliances due to the increased wear and tear from reduced voltage. London Economics estimate this value to be £0.36 per household per hour of voltage drop. This is equivalent to around £800/MWh, compared to their estimate of £10,000/MWh VoLL for domestic blackouts. In estimating the costs to domestic and SME customers London Economics conclude that the costs of voltage action could be very low or close to zero. They say that "the maximum voltage reduction is unlikely to have significant long-term impact on machines or equipment and most modern equipment can ride through (not shut down) low voltage situations."[12] However, they also note that their analysis does not include the potential knock-on effect of voltage sags, which they say could increase the chance of other power quality problems such as power surges. They recommend further study in this area and reiterate that their conclusions are only indicative.

3.21. Other emergency actions could also have indirect costs and consequences beyond their immediate cost but we don't know the materiality. Frequent use of the maximum generation, where NGET may instruct generators to run above their typical operating limits for short periods of time, may degrade plant over time decreasing that plants reliability in the future.

3.22. Further, we would expect the largest costs of voltage reduction to accrue to industrial customers, as there are risks that lower voltages can cause some machinery to trip. Brownouts may therefore affect production processes, sales, and customer relations in case of non-deliveries. The cost of equipment to deal with voltage fluctuations may be expensive and therefore brownouts are likely to be more costly to industry than to domestic customers.

Quantification of Consumer Benefits

3.23. We can give some indication of the benefit to consumers by estimating the amount by which additional balancing services may avoid energy being unserved.[13] We can turn this into a monetary value by multiplying it with the value consumers place on this energy. Several concepts are important to understand for this analysis:

[12] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/224028/value_lost_load_electricty_gb.pdf

[13] These indications do not include the benefits from avoiding emergency actions ahead of controlled disconnections.

Loss of Load Expectation (LOLE) – the expected number of hours each year in which demand will be above supply[14]

Expected Energy Unserved (EEU) – the expected amount of electricity demanded each year that will not be met; it considers the likelihood and the potential size of any supply shortfalls

Value of Lost Load (VoLL) – as described in the last section, this is the value that electricity users place on security of supply.

Reliability Standard – an objective level of security of electricity supply set by the government[15], which will be the basis for establishing the amount to contract in the Capacity Market and which will be used in Ofgem's EBSCR.

3.24. Using the above concepts, the value of proposed new balancing services can be estimated by the following relationship:

$$VoLL \times \Delta EEU = value\ of\ proposed\ new\ balancing\ services$$

3.25. Ofgem's Capacity Assessment 2013 estimates the EEU under various sensitivities. However, it is not clear what the EEU would be after new balancing services are procured. NGET, in their formal consultation, have proposed that they would procure roughly up to DECC's draft reliability standard of 3 hours LOLE. However, as the reliability standard is measured in LOLE, we use two methods to estimate the potential reduction in EEU.

Method 1: Calculation using "typical outage"

3.26. For the first method, we calculate the value of a typical outage, which we regard as any time when emergency actions would be required. It does not necessarily equate to customer disconnections as emergency actions may be able mitigate the supply and demand imbalance. We can calculate the value of proposed new balancing services through the below calculation:

$$\Delta LOLE \times MWh\ outage \times VoLL = value\ of proposed\ new\ balancing\ services$$

3.27. London Economics' 2013 VoLL study assumes that a typical outage would be 1GW for one hour, with a split of 2/5ths domestic consumption, 2/5ths large industrial consumption and 1/5th SME consumption. By weighting the values

[14] LOLE is often interpreted in the academic literature as representing the probability of disconnections after all mitigation actions available to the System Operator have been exhausted. We consider that a well functioning market should avoid using mitigation actions in regular basis and as such we interpret LOLE as the probability of having to implement mitigation actions

[15] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/238867/Consultation_on_the_draft_Delivery_Plan__amended_.pdf

of lost load for each customer type by their split of consumption, we can find the weighted average value for a typical outage:

$$Value\ of\ typical\ 1\ hour\ outage\ =\ 1{,}000MWh\left(\frac{\frac{2}{5}£10{,}000}{MWh}+\frac{\frac{2}{5}£1{,}500}{MWh}+\frac{\frac{1}{5}£50{,}000}{MWh}\right)=£14.6m$$

3.28. This figure is only an indication and uses estimates for a peak winter workday.

3.29. For example, taking one of the more pessimistic sensitivities - the high demand sensitivity – from the Capacity Assessment 2013, the LOLE is 8.73 hours. Using the above formula, we subtract the reliability standard from this to give the reduction in LOLE and multiply this by the value of a typical outage.

$$Value\ to\ consumers = (8.73-3)\times £14.6m = £84m$$

3.30. London Economics' 2013 VoLL study also suggests there are reasons for dropping I&C customers from the calculations of values to consumers, for instance because there are demand response opportunities which will lower the impact for these customers. In the study they give a weighted average VoLL figure for domestic and SME customers of £17,000/MWh. This is also the figure used in DECC's draft reliability standard.

$$Value\ of\ typical\ 1\ hour\ outage\ =\ 1{,}000MW\left(\frac{£17{,}000}{MWh}\right)=£17m$$

Using the same example above this gives:

$$Value\ to\ Consumers = (8.73-3)\ \times £17m = £97m$$

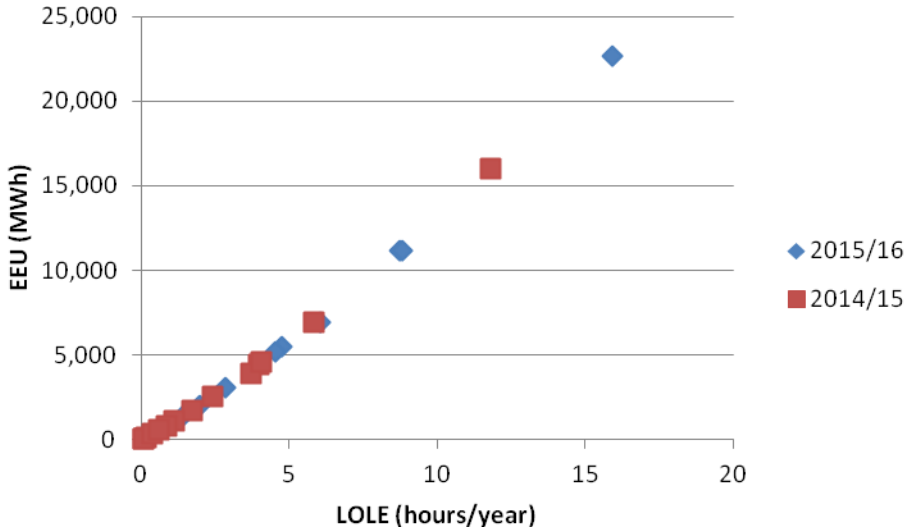
3.31. We can calculate these figures for a range of sensitivities within the Capacity Assessment. By doing so we determine the indicative benefit of bridging the gap in LOLE between each sensitivity and DECC's draft reliability standard. While this gives an indication of the range of benefits it heavily relies on the underlying assumptions used in each of the sensitivities of the Capacity Assessment, which we have used here for illustrative purposes only. Further, by using the value of lost load we implicitly assume that all hours of lost load result in disconnections. Therefore it is possible the actual benefits could well be lower. However we also note these calculations do not include the value of avoiding the cost of emergency actions such as maximum generation. As such, these figures should be treated as indicative only. The resulting calculations can be found in table 3.2, at the end of the next section.

Method 2: Estimating an EEU for the draft reliability standard

3.32. To test the assumptions of the methodology above we can also calculate the benefits using an alternative methodology. This will help to give a range of the likely benefits. This is especially helpful as we have limited information on the value of a "typical outage".

3.33. We can estimate an EEU associated with the reliability standard by finding similar values of LOLE within the capacity assessment. Below we present a chart plotting the LOLE and EEU of various sensitivities from the 2013 Capacity Assessment, split by year. Figure 3.2 shows the indicative relationship between LOLE and EEU is roughly linear allowing us to linearly interpolate between two values of LOLE to find a reasonable estimate of EEU. We note this is to indicatively assess the value of potential new balancing services and not to set a standard of EEU.

Figure 3.2: The indicative relationship between EEU and LOLE for different sensitivities in the 2013 Capacity Assessment



3.34. We can calculate an EEU equivalent to DECC's draft reliability standard of 3 hours by picking two points within the same year which sit either side the standard of LOLE and linearly interpolating between them. For example, in table 3.1 we take two sensitivities for 2015/16 and using the below formula we can interpolate an EEU for the draft reliability standard.

Table 3.1: Two sensitivities of the 2013 Capacity Assessment around DECC's Draft Reliability Standard LOLE of 3 hours/year

Sensitivity	LOLE (hrs/yr)	EEU (MWh)
Reference Scenario 2013	2.85	3,070
High Demand	8.73	11,130

$$EEU\ equivalent = 3070 + (Draft\ Reliability\ Standard - 2.85)\frac{(11{,}130 - 3{,}070)}{(8.73 - 2.85)}$$

$$= 3{,}280\ MWh$$

3.35. If we use the same example as method 1, where potential new balancing services are procured from the high demand sensitivity in 2015/16 to the draft reliability standard, the EEU would drop from 11,130 to 3,280. The value of this would be:

$$Value\ to\ consumers = (11{,}130 - 3280) \times £17{,}000 = £133m$$

3.36. Table 3.2 estimates the benefits to consumers for both methods for three sensitivities from the Capacity Assessment in 2014/15 and 2015/16. We choose the 2013 Reference Scenario, the High Demand sensitivity, which shows the risks if demand reductions do not materialise and the worst case sensitivity presented in the report, low availability of conventional generation.

Table 3.2: Benefits to consumers per year by sensitivity

	2014/15		**2015/16**	
	Method 1	**Method 2**	**Method 1**	**Method 2**
Reference Scenario 2013	£0*	£0*	£0*	£0*
High Demand	£18m	£23m	£97m	£133m
Conventional Generation Low Availability	£150m	£216m	£220m	£330m

Note: * The benefits are measured as £0 under sensitivities where DECC's draft reliability standard would already be met. This is not a reason to reject the application as approving amendments to the C16 documents does not necessarily mean NGET would procure those services.

Costs to consumers

3.37. This section focuses on the costs of implementing new balancing services and the impact this has on consumer bills. We have based our quantitative analysis on NGET's own cost estimates, but note in some areas reliable quantification is not possible and would lead to spurious accuracy. Instead, where necessary we provide qualitative assessment.

Potential Costs of New Balancing Services

3.38. In their consultation, NGET estimates the total cost of procuring new balancing services would be around £75m each year as set out in table 3.3. This does not include the internal costs for NGET to provide these services.

3.39. There is likely to be a large range around this figure, as the costs will depend on the amount of new balancing services needed, the frequency and size of any tight period, the response of DSBR and the tenders. There is a non-linear relationship between margins and risk (LOLE). A 1GW increase in margins has a smaller effect on LOLE than a 1GW drop. As such, this means the relationship between different sensitivities is also non-linear.

3.40. No assessment is given to the split of costs between years, as this requires further detailed analysis of likely scenarios and assumptions about NGET's tendering, such as the length of contracts. The 2013 Capacity Assessment shows that risks are highest in 2015/16 and so we expect costs to be higher than in 2014/15.

3.41. NGET implicitly assume in the utilisation calculation that all of the potential new balancing services are used in each event. In reality, the utilisation cost will depend on the size of the event and the response of service providers. As the Capacity Assessment 2013 suggests, the nature of the GB system means that any shortfalls in electricity are likely to manifest themselves as a number of small events, rather than one large event. Therefore we consider it likely that the true utilization figures will be lower than those suggested by NGET.

Table 3.3: External costs of new balancing services per year

	Set-up/Availability*	Utilisation	Total/year
Both	£36m	£39m	£75m
DSBR	£10m	£15m	£25m
SBR	£26m	£24m	£50m

Note: These figures do not include NGET's internal costs, if any
**Set-up refers to fixed payments to DSBR, availability refers to fixed payments to SBR*

Distribution of Costs between Consumers

3.42. We convert the external cost figures to impacts on consumer bills and present the results in table 3.4. Note that these estimates do not include NGET's internal costs for the products. We use the same methodology as in NGET's consultation[16].

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$$Impact\ on\ bill\ [x] = \frac{average\ consumption[x]}{total\ market\ consumption} \times total\ cost$$

Table 3.4: Potential annual impacts on average consumer bills

Type of Customer	*Estimated Impact on Bill per Year*	*As % increase on bill*
Domestic	**£0.75**	0.13%
SME	**£6.59**	0.26%

*Note: * we do not possess figures for large I&C customers. Demand for these customers differs significantly and any figures would not be accurate to the real increases in bills*

*** The total market consumption is assumed to be 3.3TWh, as given by NGET. Consumption figures for domestic consumers follow Grid's methodology and assume 3.3MWh/year. For SMEs we use an average of 29.4MWh/year, taken from the London Economics VoLL study. Average bill figures are also taken from this study and are £600 for domestic consumers and £2,500 for SMEs.*

3.43. These figures serve only as an indication and do not reflect the actual pass through of costs to consumers. It will be for suppliers to decide how costs are passed on through their tariffs and this can depend on the elasticity of demand of each customer type and the type of tariff they are on.

Vulnerable Customers

3.44. As our analysis in the sections above shows, the impact on consumer bills will vary in line with consumption levels. We note that the consumption levels of different types of vulnerable customers will vary significantly, and that it is not possible to differentiate the impact of this application on different types of vulnerable customers in a quantitative way that would be meaningful. However, we recognise that there are certain types of vulnerable customers who could be more significantly impacted by NGET's application than others. For example, those on low incomes, who are more likely to be in fuel poverty, would likely find any increases in their bills proportionately more difficult to bear than others.

3.45. We note that London Economics measures the value of lost load for vulnerable domestic customers at £12,000/MWh and finds this to be higher than the average for domestic customers at £10,000/MWh because they are more reliant on electricity. This suggests vulnerable customers would value balancing services more than an average domestic consumer.

Potential Costs from Competition Impacts

3.46. The impacts on competition and other unintended consequences on the market set out above could add further secondary costs to consumers. For example, if plant were to leave the wholesale market to take up an SBR contract, this might increase wholesale prices, which could in turn push up prices for consumers. However, these effects can be complex and we cannot reliably quantify them.

Other impacts

Impacts on sustainability and the environment

3.47. We note the potential for both positive and negative effects on carbon emissions resulting from the SBR and DSBR.

3.48. For example, the DSBR may, by encouraging greater demand side participation, reduce the need for more traditional generation. Some embedded generation could be low carbon but some may not be, for example, diesel generation. Overall, we note that there are several mitigating factors which would reduce any negative effects on the environment of the SBR and the DSBR. Firstly, NGET would only procure these services where there is a clear need. Secondly, NGET note that they expect the services to run very rarely. Thirdly, generation plant that operates in GB is subject to both domestic and European environmental legislation, for example, the Large Combustion Plant Directive and the Industrial Emissions Directive. The existence of such legislative requirements mitigates the extent that any plant participating in the SBR could negatively impact the environment beyond what this legislation already permits.

Impacts on health and safety

3.49. We think the only potential benefit to health and safety from NGET's application to introduce new balancing services is that it may avoid emergency actions and thus avoid running plant in non optimal way as may be the case under a maximum generation instruction.

Appendix 1 - Consultation Response

1.1. Ofgem would like to hear the views of interested parties in relation to any of the impacts and issues set out in this document.

1.2. The closing date for responses is **6 December 2013.** These can be sent to:

Julian Roberts
Economist
Wholesale Markets Policy
Ofgem
9 Millbank
London
SW1P 3GE
020 7901 7000
wholesale.markets@ofgem.gov.uk

1.3. Unless marked confidential, all responses will be published by placing them in Ofgem's library and on its website www.ofgem.gov.uk. Respondents may request that their response is kept confidential. Ofgem shall respect this request, subject to any obligations to disclose information, for example, under the Freedom of Information Act 2000 or the Environmental Information Regulations 2004.

1.4. Respondents who wish to have their responses remain confidential should clearly mark the document/s to that effect and include the reasons for confidentiality. It would be helpful if responses could be submitted both electronically and in writing. Respondents are asked to put any confidential material in the appendices to their responses.

1.5. Next steps: responses to this consultation will assist the Authority in deciding whether to accept or reject NGET's proposal to introduce two new balancing services. We will publish the Authority's decision along with a final impact assessment considering responses to this consultation in late December 2013. Any questions on this document should, in the first instance, be directed to Julian Roberts on the above contact details.

Appendix 2 - Feedback Questionnaire

1.1. Ofgem considers that consultation is at the heart of good policy development. We are keen to consider any comments or complaints about the manner in which this consultation has been conducted. In any case we would be keen to get your answers to the following questions:

1. Do you have any comments about the overall process, which was adopted for this consultation?
2. Do you have any comments about the overall tone and content of the report?
3. Was the report easy to read and understand, could it have been better written?
4. To what extent did the report's conclusions provide a balanced view?
5. To what extent did the report make reasoned recommendations for improvement?
6. Please add any further comments?

1.2. Please send your comments to:

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Ofgem
9 Millbank
London
SW1P 3GE
andrew.macfaul@ofgem.gov.uk