

ELEXON response to National Grid's consultation of its 'System Needs and Product Strategy' – 18 July 2017

ELEXON sent the following responses to National Grid in relation to its 'System Needs and Product Strategy' (SNaPS)¹.

The views expressed below are those of ELEXON Limited, and do not seek to represent those of the BSC Panel or BSC Parties.

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General observations on SNaPS

National Grid's SNaPS is driven by key, recognisable themes: changes in market participation, which in turn puts pressure on the effectiveness and costs of existing Balancing Services, and concerns by market participants with the transparency, complexity and access to providing existing Balancing Services.

We share in the concerns summarised by National Grid with the current set of Balancing Services and so support National Grid's proposal to review and simplify them. We believe this is important to ensure a clear, coherent and consistent set of products and markets. These will then allow participants of all sizes and types to understand the purpose of, opportunities to provide and use (historically, currently and forecast) of Balancing Services by National Grid. We also believe that simplifying Balancing Services to ensure a level playing field is consistent with the requirements of the European Third Package and related European Network Codes and Guidelines.

We believe that National Grid should consider the use of existing, common industry arrangements and systems when setting out the terms or for providing information about simplified existing Balancing Services and new Balancing Services. That is, the industry is already the subject of detailed common arrangements and systems, which are described in industry codes and agreements. National Grid and market participants may benefit in terms of transparency, consistency and certainty from setting out the rules, processes and systems related to some or all Balancing Services in a common code or agreement.

There may also be more practical reasons for centralising the arrangements for Balancing Services. That is, common arrangements may enable a consistent and efficient means of collecting metered data to demonstrate a service has been discharged and accurately billed for, to provide assurance to parties providing and receiving services and to enable the timely and detailed publication of data and information about the service(s) to the provider or the market in general.

The BSC already sets out common requirements for the collection of metered data, assurance and provision of data and information in support of the BM and Imbalance Settlement. Over time, rather than duplicate the BSC arrangements, data collected, assured and published under the BSC has been used (and developed) for other purposes, notably network charging, EMRS and to enable compliance with regulatory data publishing requirements (REMIT and Transparency). These additional 'users' avoid the costs of replicating arrangements and are able to take advantage of established and

¹ <http://www2.nationalgrid.com/UK/Services/Balancing-services/Future-of-balancing-services/>

common rules, processes and systems, and influence the development of the arrangements through open governance rules.

ELEXON recognises that as the industry evolves, the requirements/needs for collecting metered data, assurance and data publication are evolving too. We are beginning to work with industry to see how the existing BSC arrangements may be developed to support these changing needs. For example, we are considering how existing requirements for metering, the registration of metering and assurance of metered data might be extended to include metering not traditionally used for Settlement purposes, e.g. on-site, sub-boundary metering. Development in this area may also support the metering requirements for Balancing Services.

In order to provide transparency to BSC Parties, other market participants and interested parties, the BSC requires that important forecast and imbalance settlement data is published on the Balancing Mechanism Reporting Service (BMRS). The BMRS provides free access to users at all times to support their investment and operating decisions.

Over time the BMRS has been used to support more than the publication of imbalance settlement data. It's also become an important tool for publishing and reporting REMIT and Transparency data.

Earlier this year, ELEXON completed a project that reviewed and upgraded the technology that provides the BMRS. The upgrade ensures that the BMRS remains up to date and able to serve the growing numbers of users who rely on it for timely and detailed market data.

SNaPS proposes to improve the transparency of data and information necessary to enable market participants to understand and participate in the provision of Balancing Services. This is likely to require National Grid to review how it publishes data about existing and new services. We strongly believe that the BMRS should be considered as a means for supporting National Grid's reporting and publishing requirements. This is because the BMRS provides an existing, established and recently upgraded tool for publishing, viewing and downloading important market data. By making best use of existing infrastructure, National Grid would likely save costs (i.e. rather than building new systems or websites) and simplify access to Balancing Services data and information by market participants.

ELEXON is at the core of the electricity market in Great Britain. We compare how much electricity generators and suppliers said they would produce or consume with actual volumes. We establish a price for this electricity and settle around £1.5bn of funds accordingly. Our work ensures the smooth operation of the market, supports new entrants and innovative business models and ensures a level playing field for electricity wholesale market players. Our data supports wider industry cost recovery and validation mechanisms, is shared transparently and used to report on market trends.

Q11. What are your views on the possibility of trialling different procurement approaches such as cleared price auctions and day-ahead markets?

Trialling and learning from different procurement approaches is a sensible way of understanding how they might operate in practice.

Any such trial would need to be clearly defined and communicated, and be sufficiently realistic of the final scheme, in terms of participation, operation and scale, to ensure it provides useful feedback for National Grid and potential participants.

ELEXON has over 17 years' experience delivering and supporting market operations in the electricity industry. This experience is mainly focused on the operation and development of existing settlement schemes, i.e. the BSC and EMRS, but is also based on its involvement in and guidance on the wider retail and wholesale market arrangements, including the development and implementation of the European Network Code arrangements.

ELEXON welcomes the opportunity to participate in any trials National Grid considers running. We believe we could support National Grid either as a trusted, independent industry expert, or as an experienced market operator with a proven track record for effective delivery and customer service.

Q12. What other changes need to be made to other markets, such as the Balancing Mechanism, wholesale market and capacity market?

Given the Balancing Mechanism's longstanding role and relationship with other Balancing Services, we are concerned that your SNaPS does not:

- elaborate on your observations (that access to flexibility is reducing and costs rising);
- provide direction on how the BM might be improved to overcome these observations; and
- provide more information on how your plans for other Balancing Services should affect the future role and operation of the Balancing Mechanism and the calculation of Imbalance Settlement and Imbalance Prices.

Role of the BM alongside other Balancing Services

The Balancing Mechanism (BM) is a longstanding and an integral Balancing Service, which National Grid uses to fine-tune the balance of energy on the System close to real time. Its design and operation is closer to that of an open market, where all participants with a BM Unit (BMU) can participate and can flexibly vary their participation; whereas other Balancing Services tend to be limited to particular providers, who must successfully win a contract, often many months or even years before being called on.

In addition to supporting National Grid's fine-tuning of energy imbalances, National Grid also uses the BM as the mechanism for dispatching other Balancing Services, e.g. BM STOR.

The BM is more than just a tool used by National Grid. Through the publication of BM activity and the calculation of imbalances and System Prices (in accordance with the BSC Section T), its operation provides important investment and operating signals to the wholesale market - e.g. through its operation it provides insight into market and balancing behaviours, and enables cost and price discovery.

The calculation of System Prices reflects the marginal cost(s) incurred by National Grid to balance energy on the System. In particular, ELEXON calculates System Price using the most expensive costs of individual actions taken by National Grid, i.e. acceptances in the BM and Balancing Services taken outside of the BM. The costs of BM and non-BM actions included in the calculation of System Prices are either set according to the actual price of the action or in certain circumstances re-priced, e.g. to reflect the Value of Lost Load.

The BM's role and interdependency with other Balancing Services means that National Grid should take particular care to ensure that any review of individual Balancing Services or a review of all Balancing Services should ensure that the BM's position amongst Balancing Services is considered and updated where appropriate. This is not only to ensure the range of Balancing Services remain coherent but also that use of the BM's outputs by the market for other operational and investment purposes are maintained and preferably enhanced (unless National Grid believes this is better achieved through other routes?).

Balancing Mechanism: Case for change

SNaPS makes two observations about the Balancing Mechanism; that availability of flexibility is i) reducing, or ii) becoming more costly. And that these concerns are driven by changes in market

participation (reduction in number or availability of traditional, thermal, transmission connected participants and growing numbers of smaller providers on the distribution systems and non-traditional business models) and the historical nature of the current arrangement's design.

It is clear that market participation is changing. Below, our summary analysis demonstrates how, through our administration of the BSC arrangements, participation in the BSC and in the BM has changed in recent years. However, we are not convinced that SNaPS or our summary analysis provides a clear case that participation by flexible plant in the BM has become more limited or costly. We note that we have not completed a more detailed assessment of participation (e.g. analysis of all accepted and unaccepted bids and offers available, i.e. to assess the 'depth of the market') and would welcome further evidence by National Grid that demonstrates its observations. In turn this evidence can help to better understand the nature of any problems and identify targeted solutions.

In the following paragraphs we have also highlighted work by ELEXON and BSC Parties that is or was aimed at improving access/participation or the efficiency of the market.

Access to the BSC and BM

We can see from the numbers of new BSC Parties and BM Units registered that participation, particularly by renewable and embedded generators, and parties operating non-traditional business models are growing.

In 2016, 12 new generators became BSC Parties and we are currently in discussions with a further seven generators. We also recorded the energisation of 38 new generation BM Units, of which 16 were embedded BMUs, and the majority of these BMUs belonged to windfarms. This is significant because in the past, embedded generation would typically be connected and registered as part of a Supplier's BMU or Additional BMU. Whilst the growing number of dedicated generation BMUs may be because these parties are required to meter their imports and exports specifically for EMR purposes, it may also indicate that they are choosing to operate independently and (potentially with the intent of) actively participating in the BM.

Between 2001 and 2016, the BSC Panel approved 50 non-standard BM Unit configurations, with 11 approved between 1 January and 22 November 2016. The majority of non-standard BMUs approved in the last 12 months have been to register multiple, small Generating Units as a single BMU, rather than individual standard BMUs. The registration of non-standard BMUs can indicate changes to the configuration of an existing site to adapt to a change in circumstance or the connection of a site with an unusual or novel configuration, e.g. a non-traditional business model. Based on our projections, we expect the number of non-standard BM Units (particularly aggregation of many small Generating Units) to double in the next six years.

We can also highlight from data published on the BMRS that the fuel mix is changing as the operation of renewable sources are displacing traditional forms of energy. For example, wind generation has now become the fourth largest contributor to the fuel mix and on 25 March 2017, solar energy's contribution was large enough to reduce the peak midday demand below the peak night-time demand for the first time ever.

However whilst we are seeing growing numbers of embedded and renewable generators becoming BSC Parties and registering BMUs, transmission-connected sites still dominate participation in the BM.

Bids to reduce energy

In line with overall changes in the fuel mix, accepted bids from wind power increased from 1% in 2012 to 10% by end of Q1 2017. However, gas-powered plants remain the main fuel type (48%-61%) bidding to decrease their output. (Figure 1)

Accepted bids from renewable generators and other non-‘Big 6’ generators have increased taking their combined market share to 37%, reducing Big Six’s share from 78% in 2012 to 63% in Q1 2017. However, the volume of accepted bids by embedded BMUs only accounted for between 1-1.5% of all accepted bids between 2013 and 2016. (Figure 2)

Offers to increase energy

Between 2013 and 2016, gas, coal and pumped storage generation were the main providers of accepted offers (on average 99.2% of all accepted offers) and continue to be the plant that can produce both flexibly and on short notice. There is very little participation by wind or other renewables to increase generation output as they depend on external factors (e.g. wind speed) to generate electricity. (Figure 3)

However we note that in future, growing interest in using on-site storage may mean that renewable generators will have greater flexibility to not only offer to reduce their production but also increase their output at short notice.

In terms of the diversity of participants offering to increase production, the proportion of ‘Other generators’ (i.e. independent but not renewable) share has gradually increased to over 35% by the end of Q1 2017. The volume of accepted offers by Embedded BMUs has typically remained steady at around 2.1% of accepted offers between 2013 and 2016. (Figure 4)

Changes in market participation challenge the way existing arrangements across the industry work and whether they enable fair access to all. Through BSC Modifications, ELEXON’s support of the BSC Panel’s Strategic Plan and its close support of existing and potential BSC Parties, concerns about access to and participation in the BM are being actively engaged by BSC Parties, interested parties and ELEXON.

As part of BSC Modifications P344², P354³ and P355⁴, ELEXON and BSC Parties are considering how participation in the BM and operation of Imbalance Settlement should change to reflect changes in market participation. These Modifications, particularly P344 and P355, are considering fundamental questions to do with who can and how they can participate in the BM. We note that National Grid is already represented on the Workgroups for these Modifications. We’d welcome National Grid’s thoughts on how it plans to coordinate its thinking and provide direction on the key issues facing the BM to ensure the consistent development of the BM through these Modifications and of its Balancing Services more generally as part of its SNaPS.

² [P344 ‘Project TERRE implementation into GB market arrangements’](#)

³ [P354 ‘Use of ABSVD for non-BM Balancing Services at the metered \(MPAN\) level’](#)

⁴ [P355 ‘Introduction of a BM Lite Balancing Mechanism’](#)

Figure 1 Proportion of accepted bid volumes by fuel type (Source – ELEXON)

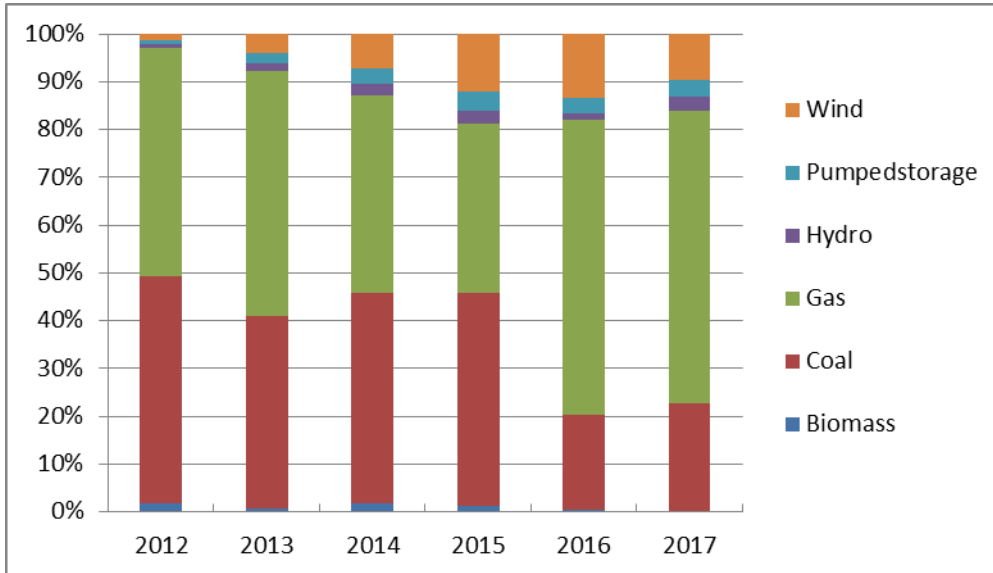


Figure 2 Proportion of accepted bid volumes by company type (Source – ELEXON)

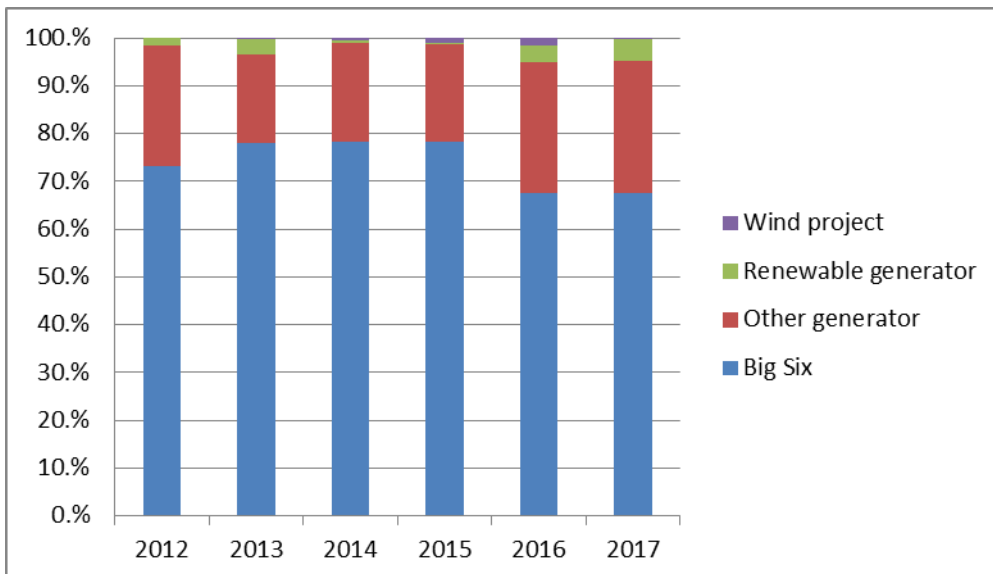


Figure 3 Proportion of accepted offer volumes by fuel type (Source – ELEXON)

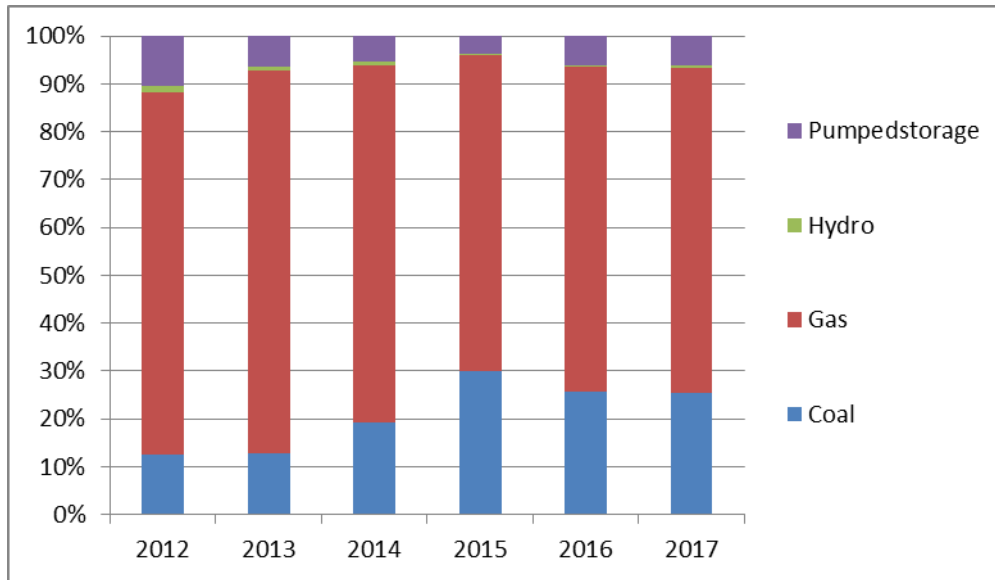
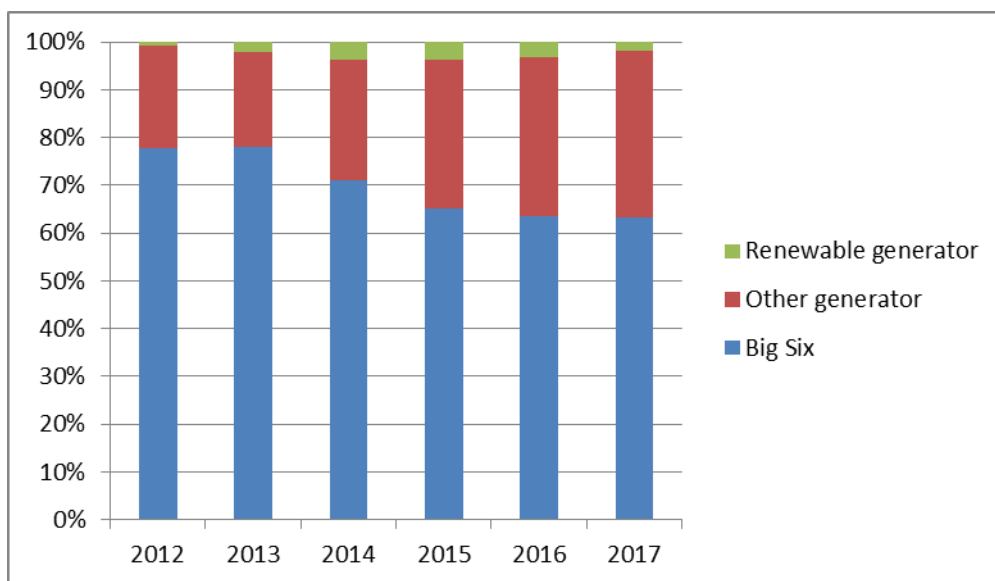


Figure 4 Proportion of accepted offer volumes by company type (Source – ELEXON)



Costs of accessing flexibility

The SNaPS document observes that the cost of accessing flexibility through the BM is rising. Whilst one could draw this conclusion anecdotally, i.e. intermittent forms of generation, e.g. wind, have displaced more reliable generation capacity in the overall fuel mix, SNaPS did not provide any detailed evidence to support the observation or to highlight whether particular aspects of the BM are causing costs to rise.

Based on our role administering the BSC’s Imbalance Settlement arrangements, we have taken an initial look at the cashflows and volumes of acceptances in the BM between 2013 and 2016.

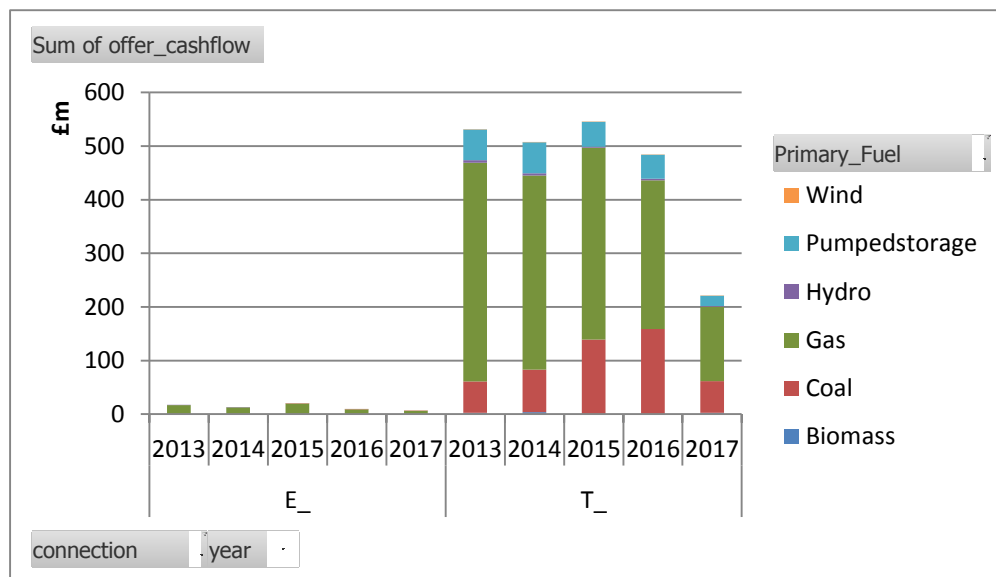
Our analysis shows that BM cashflow for accepted Offers has fluctuated between £493m and £565m per year between 2013 and 2016 with no clear upward or downward trend. (Figure 5) Furthermore, the volume of accepted offers steadily rose from 7.1TWh in 2013 to 8.8TWh in 2015 but then dropped off significantly to 5.8TWh in 2016. (Figure 6) Whilst this significant reduction in accepted volumes resulted in a clear rise in the cost per MWh of offers, from £64/MWh in 2015 to £85/MWh in 2016, the cost per MWh trend was decreasing in the preceding years (from £77/MWh in 2013 to £64/MWh in 2015). (Figure 9)

We observed a clearer trend when looking at accepted Bids. That is, between 2013 and 2016 the cashflow from industry to National Grid from accepted Bids has reduced year on year. (Figure 7) This is mainly because of the growing volume of accepted, negatively priced bids from windfarm operators. The growth in negative cashflows (i.e. from NG to Parties) for accepted bids rose from £33m in 2013 to £81m in 2016 and peaked at ~£91m in 2015. This increasing participation by wind in the BM will have reduced NG’s net revenue from accepting bids to reduce generation on the System.

Also, a simple review of the overall Balancing Services costs summarised in National Grid’s annual Procurement Guidelines Reports between 2013/14 and 2016/17 does not show any particular trend in yearly costs for using the BM. That is, costs (STOR and BM utilisation, BM Startup and BM Constraints) were £369m in 2013/14, fell to £329m in 2014/15 and rose through 2015/16 to £379m in 2016/17. Excluding BM Constraints shows that costs fell from £98m in 2013/14 to £51m in 2015/16 but then rose significantly in 2016/17 to £83m.

We appreciate that a simple review of BM cashflows and costs does not identify the underlying fundamentals and costs of the BM. For example, we have not carried out analysis of the depth of the BM, i.e. the overall level of active participation and the spread of available (accepted and unaccepted) bids and offers for NG to choose from. We’d welcome any further analysis NG can share that demonstrates its view that the BM is becoming more costly. This analysis would also help to put the costs and participation in the BM in context alongside other Balancing Services, and identify whether there are specific aspects of the BM that are proving costly (and therefore how we address this in parallel with changes to other balancing services).

Figure 5 Total cashflows from accepted offers (Source – ELEXON)



'E_' contribution by embedded BMUs; 'T_' contribution by transmission connected BMUs

Figure 6 Total volumes from accepted offers (Source – ELEXON)

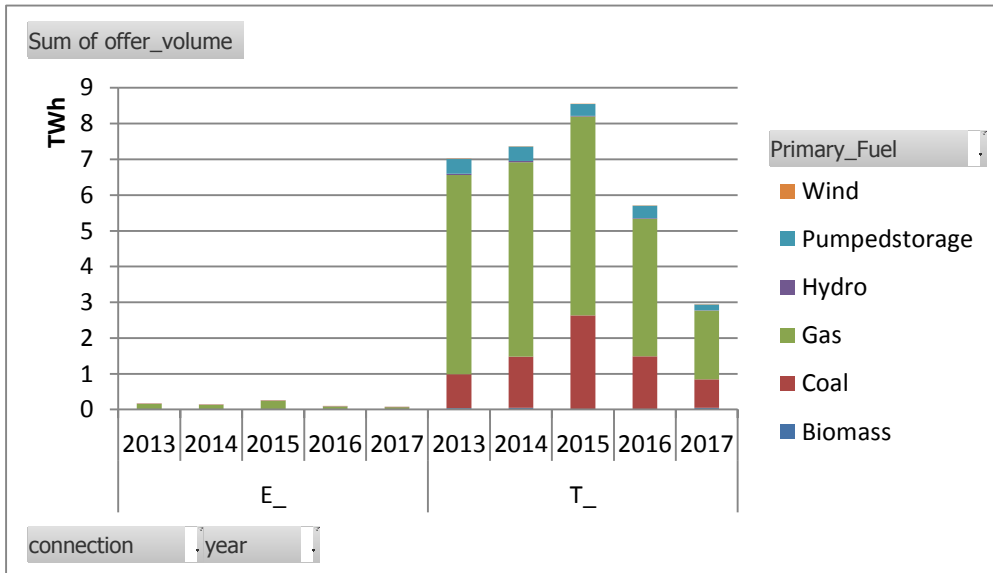


Figure 7 Total cashflows from accepted bids (Source – ELEXON)

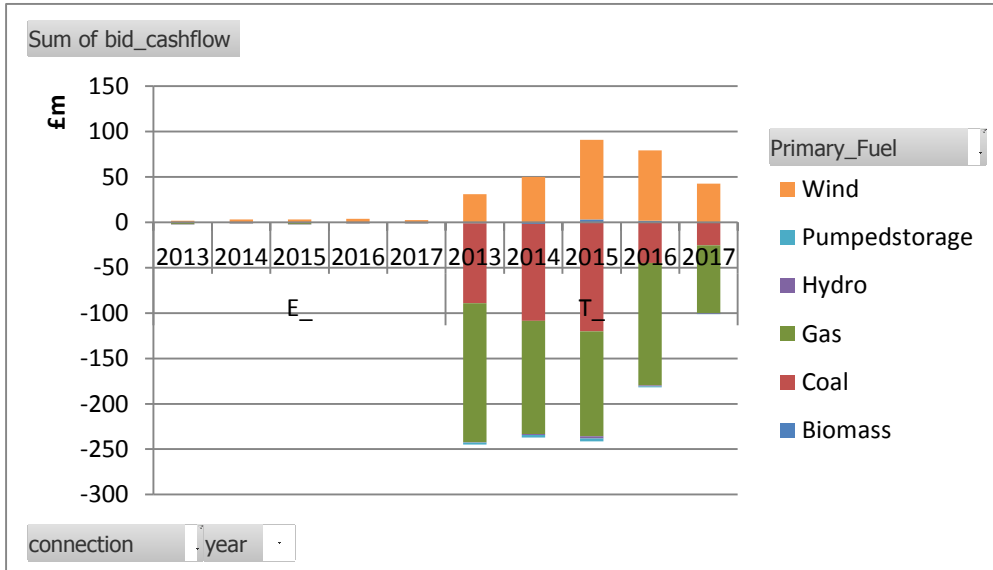


Figure 8 Total volumes from accepted bids (Source – ELEXON)

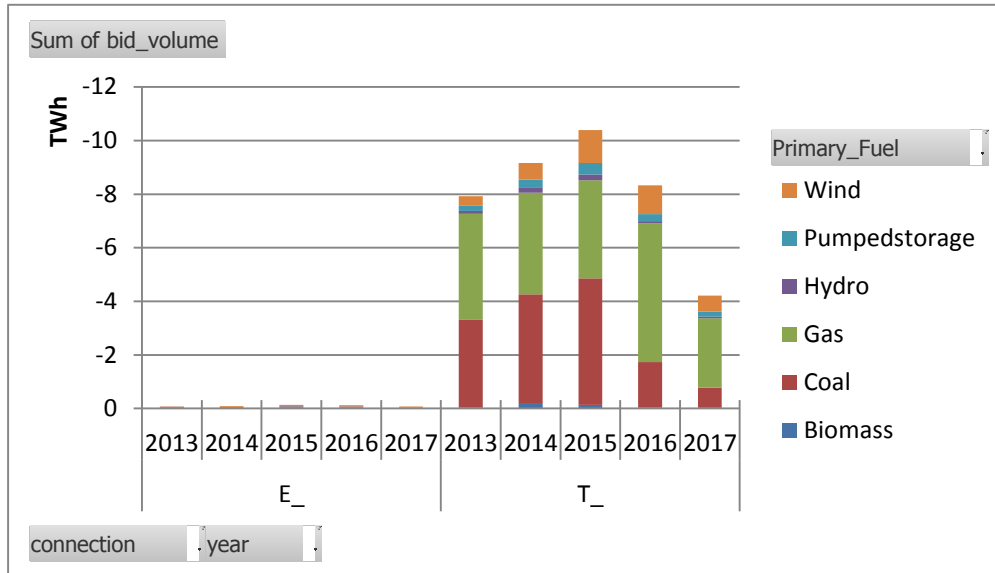
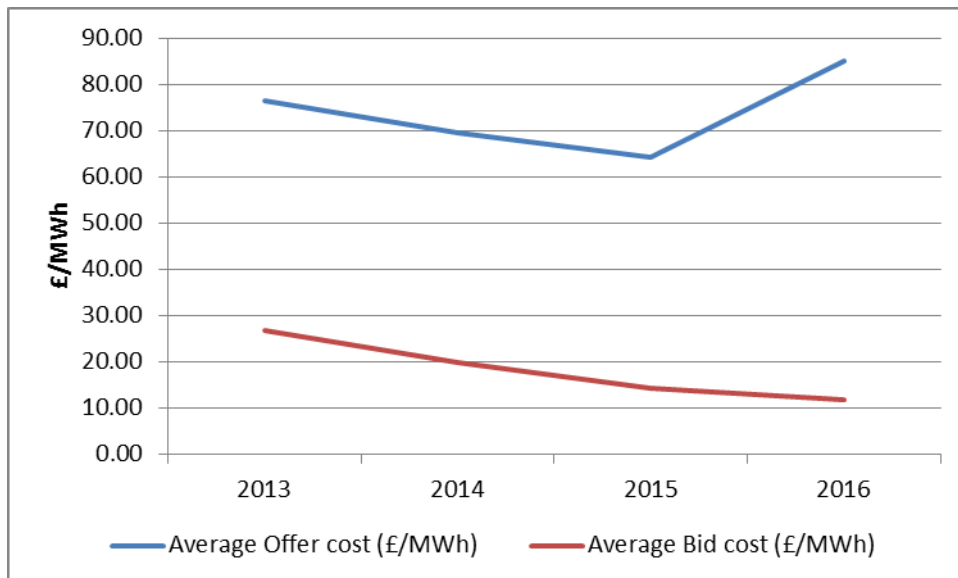


Figure 9 Weighted average costs of accepted bids and offers (Source – ELEXON)



Other areas for consideration – European requirements

The implementation of the EU Third Package and related European Network Codes affect many aspects of the GB arrangements. These changes already (or will) require that GB arrangements adopt European principles and requirements and in some cases introduce new products and markets to facilitate cross-border trading and balancing. The implementation of European requirements, products and markets is ongoing and so the development and implementation of SNaPS must have due consideration to the overarching European arrangements and timetable for their implementation. This is to ensure consistency and clarity in the development and implementation of SNaPS and European requirements.

In particular, ELEXON believes that National Grid should pay particular regard to an overarching European principle that the use of European products and markets should take precedence over national products and markets; and that the ongoing implementation of Project TERRE (being facilitated in part by BSC Modification P344) and the forthcoming Project MARI will have direct implications for the operation of the BM (and other Balancing Services).

In these regards, ELEXON is already working closely with National Grid to understand and coordinate the implementation of European requirements. We are aware that as TO and SO, National Grid continues to have an active role in developing and implementing the European requirements. However, we encourage National Grid to work closely with us, through your own Code Administration team as we have developed plans that are used by industry and Ofgem to identify, understand and influence interdependencies. We must ensure that any changes introduced through SNaPS work is developed and implemented efficiently and in line with current European changes.

Other areas for consideration – impact on System Prices

To the extent that Balancing Services agreed outside of the BM are included in the calculation of BSC System Prices, National Grid should give careful consideration to how updated or new Balancing Services should be reflected in the calculation of System Prices. For example, STOR actions taken to increase generation on the system are included and may be repriced to equal VOLL, but equivalent Balancing Services actions in the opposite direction, e.g. demand turn-up, are not explicitly included or repriced. We note that demand turn-up is a relatively new service but if its use increases (e.g. to manage growing levels of solar and wind, or a growing tendency for BSC Parties to hold a long imbalance position⁵) then there may be a case for explicitly recognising its costs in the calculation of BSC System Prices. Taking the opportunity to better reflect Balancing Services in the calculation of System Prices would improve the cost reflectivity of their calculation and provide a stronger signal to participants and observers about the costs of balancing the System.

Q13. What considerations should be made during this work to ensure that any future DSO developments (i.e. the procurement of balancing services by or from distribution networks) are coordinated?

As with your approach to developing Balancing Services, we believe that a similar focus should be applied to the development and coordination of DSO arrangements. That is, that these arrangements should be simple, common, coherent and scalable for Transmission System and Distribution System operation, and apply to all TSOs and DSOs. A single, common set of arrangements would clearly and consistently set out the individual roles, responsibilities, overlaps and hand-offs between operation of the Transmission Systems and Distribution Systems. Such arrangements would provide certainty and transparency to system operators, to users of the Transmission and Distribution Systems and market participants hoping to provide services to the TSO, DSO(s) or both.

⁵ 'The system has been long more frequently in 2015/16. The net imbalance on the system was long in 69% of Settlement Periods from December 2015 to November 2016, compared to 57% in the same period for the preceding year. In 2013/14 65% of Settlement Periods were long and in 2012/13 62%. Between December 2015 and November 2016, Parties long imbalances were 33% greater and short imbalances 10% greater compared to the same period from the previous year.' ['Summary and Key Points - Post Implementation Review Of P305'](#), February 2017

It is encouraging that National Grid is already working with DNOs, in particular through the Open Access work by Energy Networks Association, to explore the opportunities for developing DSO arrangements. In addition to this work, we encourage National Grid to work with other related parties and stakeholders to ensure a broad level of engagement, particularly at a time when the nature of market participation and total System Needs are evolving. This engagement should include independent DNOs, which may not be members of the ENA, market operators and industry code bodies that have experience operating and administering the arrangements that govern connection and use of the transmission and distribution networks and participation in both the wholesale and retail markets.

Furthermore, we believe the development of effective System Operation arrangements can only be achieved by considering how they interact with other aspects of the (future) industry arrangements. We appreciate that this is a moving feast but it is important that we do as much as possible to ensure the overall design of the (future) arrangements are co-ordinated and consistent to maximise certainty, transparency, opportunity and scalability, and minimise unintended consequences and inefficient design and operation.