

Managing intermittent and
inflexible generation in the
Balancing Mechanism

About this document

This document explores the issues that National Grid as System Operator has encountered when faced with increasing quantities of intermittent and inflexible generation and invites views on the despatching of such generation.

National Grid welcomes views on the issues contained within this document. Specific questions relating to the document can be found in Section 6. If you have any questions about this document please contact:

Balancing Services team (balancingservices@uk.ngrid.com)

Responses should be submitted to balancingservices@uk.ngrid.com by **17:00 on 18 October 2011**.

The response proforma can be found on the following link:

<http://www.nationalgrid.com/uk/Electricity/Balancing/consultations/>

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1 Executive Summary

- 1.1 Historically, low levels of renewable generation have resulted in minimal requirements for National Grid to utilise such generation when balancing the electricity Transmission System. However, the proportion of generation from renewable power sources is now reaching a level at which National Grid needs to have the ability to manage the output from such generation under a number of operational scenarios. Furthermore, the available transmission capacity can be limited on a regional basis and any additional generation connecting may be subject to localised constraints. In these areas of localised constraints, there may be a greater proportion of renewable generation leading to a higher probability of needing to take actions on such generation.
- 1.2 Recent experience of taking balancing actions on renewable generation has raised some concerns around the lack of participation of renewable generation within the Balancing Mechanism (BM) and, for some generation participating in the BM, the level of Bid prices submitted. For example on 5/6th April 2011 and also more recently on 10th - 13th September 2011, having exhausted more economic options on conventional plant, there was a requirement for National Grid to curtail wind generation in Scotland due to localised constraint issues. During these periods National Grid took actions on plant with high negative Bid prices and a number of Emergency Instructions were required to be taken to reduce generation. Accepting high negative bid prices results in higher balancing costs borne by the industry.
- 1.3 As National Grid has to balance the Transmission System in an economic manner, this consultation explores whether costs could be lowered to the industry through the existing management of the Balancing Mechanism and whether changes are required to the various industry codes. A possible solution for managing the hierarchy of actions for the re-despatching of generation for balancing purposes is presented, and feedback is invited from stakeholders on this, and issues over why generators are submitting high priced negative Bids or choosing not to participate in the BM.
- 1.4 This consultation also aims to highlight the impact of generation that does not participate in the Balancing Mechanism on the operation of the electricity Transmission System.

The Balancing Mechanism (BM)

- 2.1 The BM is National Grid's main residual balancing tool and is the means by which the acceptance of Offers and Bids to increase or decrease electricity generation can be made. Under the Grid Code, any party who is responsible for a BM Unit (BMU) is deemed to be a BM Participant; however this does not mean that they have to actively participate within the BM (i.e. submit Bids and Offers). Generally a BMU is used to describe a single generator; however they may consist of several generating units depending on its size and configuration. BMUs can also be associated with demand sites which import electricity from the Transmission System. BM Participants require electronic communication systems (Electronic Data Transfer, or EDT) in order to provide National Grid with operational data such as Physical Notifications (PN). Additionally, BM Participants who wish to actively operate in the BM require an electronic despatch mechanism (Electronic Despatch Logging, or EDL¹) which allows the submission of data to and receipt of instructions from National Grid in a fast and efficient manner.
- 2.2 The main purpose of the BM is to provide National Grid with a mechanism that enables supply and demand to be balanced across the electricity Transmission System whilst also allowing the management of system security, for example through resolving system constraints. National Grid aims to balance the Transmission System in the most efficient and economic manner. The cost of balancing the system, including that of operating the BM, is spread across all the market participants by recovery through Balancing Services Use of System (BSUoS) charges.

Physical Notifications (PNs)

- 2.3 Within the BM there is a requirement for all large generators and all small and medium generators that have a Bilateral Connection Agreement (BCA) or Bilateral Embedded Generation Agreement (BEGA) to submit their PN for each settlement period. Their PN is a best estimate of what their output level is likely to be within each half hour settlement period and provides National Grid with a view of the projected generation. This PN may be revised by a party on an ongoing basis to reflect their changing circumstances; the PN becomes fixed at gate closure for the relevant settlement period (the Final Physical Notification, or FPN) and it is this FPN that Bids and Offers are instructed against.

Bids and Offers

- 2.4 Generators who wish to signal to National Grid that they can either increase or decrease their output do so through the submission of Bids and Offers within the BM. A Bid represents a price (or range of prices) in £ per MWh that a generator is willing to pay in order to reduce their output and operate at a level below their FPN. A negative price means that National Grid would have to pay the generator to reduce their output if the Bid was accepted. Conversely an Offer represents a price (or range of prices) in £ per MWh that the generator would be paid by National Grid to increase their output if their Offer was accepted.

¹ The user provides and installs an EDL terminal at its premises (known as the Control Point), consisting of a computer and relevant software. National Grid provides the necessary communication links and connection equipment connecting to an EDL terminal at the User's control point. Initial installation costs to a user are around £30k per site, with some (variable) ongoing costs. Approximate costs to NGET of installing EDL and Control Telephony are £30-£40k per site with ongoing costs of around £7k.

- 2.5 PNs and Bid/ Offer data is submitted to National Grid via EDT, which all BM Participants are required to install to allow submission of data to National Grid (including those generators which do not wish to actively participate in the BM). If a BM Participant wishes to actively participate in the BM, they must also ensure EDL is installed to allow the submission of instructions from National Grid (in accordance with the Grid Code provisions: BC1.4.2 (d)).
- 2.6 A Bid or Offer changes the contractual position of a participant by the volume of the Bid or Offer to avoid a participant being out of balance. Hence a bid or offer price does not need to reflect any imbalance exposure, but would reflect fuel costs, wear and tear, etc and in the case of a renewable generator, the loss of Renewables Obligation Certificates (ROCs)².

Industry Governance

- 2.7 There are several industry codes and documents which National Grid and the industry adhere to when balancing the Transmission System. This includes the Balancing Principles Statement (BPS)³ which indicates the broad framework against which balancing decisions are made. This document is governed by the National Grid Electricity Transmission Licence under standard condition C16 and is complementary to the Grid Code which sets out the technical requirements for day to day operation and use of the Electricity Transmission System. In the event of any inconsistencies between the Grid Code and the BPS, the Grid Code takes precedence. The rules for trading electricity are governed by the Balancing and Settlement Code (BSC). The Connection and Use of System Code (CUSC) defines the agreement types for generators wishing to connect to the electricity Transmission System which allow for varying degrees of participation within the BM.

Connection Agreement Types

- 2.8 The following connection agreement types are applicable in GB:
- **Bilateral Connection Agreement (BCA).** A BCA must be entered into by Users who have plant or apparatus directly connected to the National Electricity Transmission System. This may include generators, demand sites and distribution networks. The User who holds a BCA is liable for transmission charges in accordance with the CUSC, including Balancing Services Use of System (BSUoS) charges and must register BM Units with Elexon for the purposes of trading and imbalance settlement.
 - **Bilateral Embedded Generation Agreement (BEGA).** This must be entered into by Users which have licensed embedded generation connected to distribution systems but have transmission access rights. The User who holds a BEGA is liable for transmission charges in accordance with the CUSC, including BSUoS charges and must register BM Units with Elexon for the purposes of trading and imbalance settlement. However if the User is an Embedded Exemptable Large Power Station (EELPS) which holds a BEGA then they are only liable for BSUoS charges.
 - **Bilateral Embedded Licence Exemptable Large Agreement (BELLA).** Large embedded generators which are deemed to be Licence Exemptable who appoint either a Supplier or trading party to be responsible for their output are obliged under the CUSC⁴ to enter into a BELLA with National Grid. Essentially a BELLA is designed to connect large embedded power stations with the minimum of regulatory obligations and is only available to generators connecting in Scotland due to the

²http://www.decc.gov.uk/en/content/cms/meeting_energy/renewable_ener/renew_obs/renew_obs.aspx

³<http://www.nationalgrid.com/uk/Electricity/Balancing/transmissionlicencestatements/>

⁴ CUSC Section 1 – Paragraph 1.3.1

different MW threshold for England and Wales. The Grid Code defines the minimum MW threshold which classifies a power station as large and this is different across the two transmission owners in Scotland. Below are the MW values which show the minimum thresholds in Scotland (hence applicable for a BELLA):

- Scottish Hydro Electric Transmission Limited (SHETL) – 10MW or greater
- Scottish Power Transmission (SPT) – 30MW or greater

2.9 Importantly, a BELLA does not commit users to adhere to the Balancing and Settlement Code (BSC) as a BELLA does not give the customer rights to operate autonomously in the electricity market. Furthermore, a BELLA does not pay for transmission access (i.e. Transmission Network Use of System (TNUoS) charges) and do not have explicit Transmission Access rights. At present, the only means of curtailing output from a BELLA is via an Emergency Instruction as provided for in the Grid Code. As BELLAs do not actively participate in the Balancing Mechanism, they do not submit prices that can be applied to Emergency Instructions. Physically, such instructions are issued via telephone rather than electronically.

Commercial Contracts for Ancillary Services

2.10 Generators are able to sign up to commercial contracts for provision of Ancillary Services (such as constraint management services) with National Grid regardless of whether they have signed up to such agreements as BCAS, BEGAs and BELLAs. Examples of such services include:

- **Constraint Management Service:** The constraint management service (CMS) is designed to manage price risk during constraints. In exchange for an availability payment, generation output and/or energy prices are required to be within set limits. The CMS is targeted at sites within constrained zones, as this is where the cost risk for the system operator lies. The CMS caters for both import and export constraints and can be provided by generation (including those that do not participate in the BM) and demand sites. The service is procured via a tender..;
- **Commercial intertrips:** this type of commercial contract utilises Intertrips to automatically disconnect generation to prevent thermal overloading on the system following a fault on the system. Depending on the bilateral arrangements these would be installed by National Grid and payment would be made to the generator post fault following the use of the intertrip. One advantage of intertrips over the use of Bid and Offers is that they only change generation output post-fault, hence they can result in lower balancing costs as bids are not required to be taken pre-fault in anticipation of the fault occurring.

Restrictions on Availability

2.11 Where a generator has signed up to either a BCA or BEGA with National Grid, they may request a connection which is a variation from the standards set out in the Security and Quality of Supply Standard (SQSS) (typically a lower standard). This is a document which sets out the technical standards for connection as required by National Grid's Transmission Licence.

2.12 In circumstances where a generator has requested a lower standard than set out in the SQSS, a clause will be inserted into the user's agreement which can allow National Grid to restrict their generation output if localised outages occur in specific circuits as detailed in their agreement. It is important to note that this obliges the generator to revise their output according to the outage at no cost to National Grid to reduce the

output of the generator (and subsequently no impact to BSUoS costs) but would expose the generator to the cost of replacing the energy..

- 2.13 As each agreement will have a differing circuit(s) which the clause relates to, it cannot be used for wider system balancing and can only be used to resolve localised constraints. However, where local constraints occur, any generators with a variation from the connection design would be included, where necessary within the hierarchy of actions for instructing plant for balancing purposes.

3 The Issue – BM Participation

Accessing Sufficient Plant in the BM

- 3.1 As renewable generation becomes an increasingly significant part of the generation mix, it will, like other types of generation, be required to undertake balancing actions to allow the system to be managed in an efficient way. Currently, the Renewables Obligation (RO) drives renewable generation to seek to maximise output; a knock on of which is that many renewable generators do not wish to have their output potentially curtailed in the BM.
- 3.2 Active BM participation is currently optional for all, although the requirement to register BM Units with Elexon depends on a generator's connection agreement type. Those generators with BELLAs do not register BM Units with Elexon or have the systems in place to participate in the BM. However those with BCAs and BEGAs do register BM Units with Elexon and may choose to participate in the BM if they so wish.
- 3.3 National Grid uses the BM to ensure a balance between generation and demand and to ensure the Transmission System is operated within specific criteria (to ensure satisfactory thermal, voltage and stability performance). Where generators choose not to actively participate, this can contribute to difficulty in balancing the system in times where there are localised transmission constraints or negative reserve issues.
- 3.4 Generally, the acceptance of these Offers and Bids is taken in price order to ensure that the balancing costs are managed efficiently. Instructions are sent electronically (via EDL) – this is to enable formulation, issue and logging of instructions in a timely and efficient manner and is particularly important at times of system stress, providing benefits that cannot be realised through issuing instructions by telephone.
- 3.5 However issues can arise in situations where the amount of priced generation within the BM is not sufficient to manage specific issues, such as reducing the flow across a thermally-constrained boundary, as there may be a lack of generation available to instruct within the BM. Furthermore, there may be significant balancing costs involved if there are a large proportion of negative Bids (which may not necessarily be priced based on market fundamentals) available on relevant plant within the BM, meaning that generators would be paid to reduce their output if such Bids were taken by National Grid.
- 3.6 Where the Bid/Offer price stack has either been exhausted or does not contain enough flexible plant to be instructed within the BM, as a last resort National Grid may have to issue Emergency Instructions to the generators which would best alleviate the system problems. Such instructions are priced at the last known prevailing BM prices for the remainder of the period for which the BM 'gate' has closed, hence if that generator is not a BM Unit, it will have no price to apply to the instruction. In this case, the instruction would be unpriced, therefore at no cost to National Grid to reduce the output of the generator (and subsequently to BSUoS costs) but would expose the generator to imbalance costs. An issue with Emergency Instructions is that these may be issued on a more regular basis to manage localised issues, e.g. in an area which contains insufficient Bids to resolve a constraint, which introduces a price discrepancy between those who have submitted Bids and Offers and those who cannot.
- 3.7 If an increasing number of generators choose not to participate in the BM, it will increasingly present difficulties to National Grid in balancing the system efficiently.

Electronic Despatch Logging (EDL)

- 3.8 National Grid raised Grid Code change C/10 in May 2010⁵. The proposal sought address the concern with the risk of increasing amounts of intermittent generation connecting but choosing not to participate in the BM and therefore not required to install EDL equipment. As a result, a significant percentage of the plant mix would not be able to efficiently provide balancing services which National Grid may need to operate an efficient, economic and coordinated transmission system. The proposed solution, which was directed for implementation by Ofgem on 8 September 2011, requires generators with a connection completion date of 1 January 2013 and after to install EDL if they are required to provide Part 1 System Ancillary Services (frequency response and reactive power), this will typically cover all generators of 50MW and above.
- 3.9 For generators who that are already connected, or are connecting before 1 January 2013, the Grid Code Connection Conditions only requires installation of EDL for a user that wishes to participate in the BM. Any user who chooses not to participate in the BM is not required to install EDL equipment.
- 3.10 National Grid has recently been encouraging additional participation in the BM by manually accepting bids from generators without EDL (whilst they continue to progress the installation of EDL). Whilst this interim mechanism had been working for low levels of despatch instructions, experience over the period 10th to 14th September has shown that issuing multiple despatch instructions to generators by manual methods is impractical. During this period, it was taking too long to issue the manual instruction which in turn was putting the system at risk. As a consequence, it was determined from a security point of view that this interim arrangement was not appropriate and instead the provisions of the Grid Code were used to issue Emergency instructions on plant without EDL.

PN Submission

- 3.11 The Grid Code requires all BM Participants (essentially all large generators and all small and medium generators that have a BCA or BEGA, plus licence-exempt plant in Scotland with a BELLA that specifies the requirement to be a BM Participant) to submit a Physical Notification (PN) for each settlement period. However during real time operation, a generator may be operating at an output above or below their PN which may cause balancing issues, particularly when managing localised constraints.
- 3.12 This may be further exacerbated by multiple generators operating above or below their PN. The Grid Code provisions require that all BM Participants must provide to National Grid accurate information when submitting their PN. For wind generation this can be more of an issue as wind can be unpredictable and so their PNs can be assumed to have a larger margin of inaccuracy. This issue was originally discussed at a Grid Code Working Group⁶ titled "Physical Notifications (PNs) from Intermittent Generation" which issued a consultation that closed on 16 June 2011⁷. Following that consultation, a request to reconvene the Working Group will be tabled at the Grid Code Review Panel on 22nd September 2011.

⁵ <http://www.nationalgrid.com/NR/rdonlyres/76DCC614-2648-453E-8BB5-C6AE0E84C8F2/48966/C10D.pdf>

⁶ <http://www.nationalgrid.com/uk/Electricity/Codes/gridcode/workinggroups/archive/PNsIntermittentGeneration/>

⁷ http://www.nationalgrid.com/NR/rdonlyres/FD98743B-166A-46EC-8E07-4CFBC4C4ECAE/46972/C_11BMUnitDatafromIntermittentGeneration.pdf

Level of Bid price

- 3.13 There have been recent requirements for National Grid to curtail wind generation in Scotland due to localised constraint issues, having exhausted all of the more economic options. These actions have raised a number of issues with respect to reducing wind generator output, in particular the use of high priced negative Bids, or “sleeper” Bids (usually as a signal that the party does not want the Bid or Offer to be accepted) and when to take action on generators which do not actively participate in the Balancing Mechanism.
- 3.14 The concept of sleeper Bids arises where a trading party provides a signal to National Grid that they do not want their output to be curtailed by submitting high priced negative Bids. The Grid Code and the Balancing Principles Statement do not specifically account for how National Grid should treat these Bids, which could be considered as being prohibitively priced (submissions go as far negative as -£99,999/MWh). For example, moving from a -£999/MWh Bid to a -£9,999/MWh Bid would see the cost of a typical action (400MW for 4 hours) increase from £1.6m to £16m, with such costs being passed onto generators and Suppliers via BSUoS charges.
- 3.15 The impact of accepting these sleeper Bids is that it results in high costs which are ultimately passed to the industry via BSUoS charges. Furthermore, whilst recent actions have been to resolve constraints and therefore such actions are ‘tagged out’ of the cash-out calculation, in the future such actions may be required to manage energy balance and therefore would feed into cash-out prices. Therefore, a key area for industry consideration is whether National Grid should fully utilise the Bid stack containing such prices or whether there should be a price threshold beyond which Bids would not be issued.
- 3.16 Possible reasons for the submission of sleeper Bids may include:
- a desire to maximise generation, especially in the case of renewable generation. Currently Suppliers are required to pay a buy out price to Ofgem if they do not present sufficient ROCs to meet their obligations under the scheme. As non active BM Participants may consist of renewable generation, the curtailment of such generation could cause a Supplier to miss their targets, therefore there would be an incentive for Suppliers to ensure that they maximised their renewable generation through a bilateral agreement with each generator;
 - the need to manage technical inflexibility (for example nuclear generators, where the ability to operate in a flexible manner may be limited); or
 - due to the nature of bilateral agreements between a generator and a Supplier.
- 3.17 Operationally, a conflict may arise where the only actions that can be taken to resolve a particular issue are either on generators with high priced negative Bids or other generation not participating in the BM. If non-BM plant was instructed via an Emergency Instruction it would be at a zero cost, as no price would have been submitted (see below).

Emergency Instructions

- 3.18 In certain circumstances, in order to preserve the integrity of the Electricity Transmission System, National Grid may issue Emergency Instructions to Generators. This is undertaken in accordance with the Grid Code. Under the Grid Code, Emergency Instructions can only be refused on safety grounds which relates to either personnel or plant safety

3.19 In cases where an Emergency Instruction is required, the BPS sets out the steps which should be taken. The BPS guidance on Emergency Instructions (Paragraph 5) has been replicated below for reference:

- (a) We will instruct those BMUs that are most effective in relieving the system problem;
- (b) Where BMUs have a similar level of effectiveness in relieving the system problem we will select on the basis of submitted Bid-Offer Data;
- (c) Where it is not possible to differentiate between the effectiveness or cost of BMUs we will instruct on the basis of:

- Effect on power flows (resulting in the minimisation of transmission losses) – BMUs that would lead to the greatest reduction in transmission losses being instructed first.
- Reserve/Response capability – BMUs with a lower response/reserve capability being instructed in preference to BMUs with a higher capability;
- Reactive Power contribution – BMUs with a lower reactive power capability being instructed in preference to BMUs with a higher capability;
- Dynamic Parameters - BMUs with more appropriate dynamic parameters being selected in preference to those with less appropriate parameters.

3.20 In the ranking order above, there is no hierarchy for embedded and non embedded generation as Emergency Instructions are issued to those generators which best alleviate the system problems. For example in areas with localised constraints, there may be a mix of embedded and non embedded generation but the latter may be instructed off first.

Pricing of Emergency Instructions

3.21 It is important to note that generally, Emergency Instructions are used as a last resort if the Bid Offer stack is close to being exhausted in the BM or if the dynamic parameters associated with Bids and Offers within the BM would not resolve a particular system problem. These would be paid at the last available price submitted by the generator for the remainder of the period for which the BM 'gate' has closed; however for generators that cannot submit Bids or Offers within the BM, they would be undertaken at zero cost.

3.22 Aside from the scenario where an insufficient volume of Bids are available, there could also be a large volume of negatively priced Bids which if accepted would result in a high balancing cost and potentially negative imbalance prices (if the requirement was to manage energy rather than system issues). These high Bid prices provide a signal to National Grid that the generator is reluctant to reduce their output and therefore the option would be to either accept the Bid or issue Emergency Instructions to generators which do not participate within the BM. In localised constraint areas where a number of generators choose not to participate in the BM, it becomes increasingly difficult to manage the balancing actions in a cost effective way.

4 Priority of Actions

4.1 The BPS states that balancing measures are achieved through the list below in cost order where possible. For example, the call off of Ancillary Service contracts may be more cost effective than accepting a certain Bid or Offer. However, the Emergency Instruction remains a last resort and cannot be included in the cost order.

- Acceptance of Bids and Offers
- Call off of ancillary service contracts – these are contracted with National Grid in advance
- Call off of other services which assist in operating the Transmission System
- Instruction of emergency actions

4.2 Neither the BPS nor the Grid Code are unduly prescriptive in how National Grid should prioritise balancing actions for energy or for constraints. This allows for some flexibility in managing specific situations, but raises the issue of whether there should be a price threshold for accepting Bids within the price stack, thereby providing a signal to generators that Bid prices above a certain level will not be taken. If this was the case then there is still an issue of whether the next action would be to instruct generation which does not participate within the BM as this would be priced at zero cost to the industry. Therefore in this scenario a potential priority could be identified as follows which would replace the current cost order:

1. Valid, relevant and not prohibitively priced Bids or Ancillary service contracts;
2. Emergency Instructions to generators which do not participate in the BM;
3. Generators with prohibitively priced Bids above a defined threshold; and
4. Instructions to nuclear generators or cascade hydro schemes where water management is an issue of environmental concern;

Whilst this example attempts to follow the principles within the Balancing Principles Statement (a requirement of the licence), it does raise the question of what we might mean by 'prohibitively priced'. Furthermore, it raises an issue over the use and purpose of Emergency instructions since these, by definition, should be for emergencies and as such should not be intertwined with non emergency actions.

4.3 For localised constraints, there may be no option but to issue Emergency Instructions to maintain system stability as there may be no availability within the BM price stack to resolve issues in a particular boundary. However, in situations where there are specific localised constraints and there are generators with a variation from the connection design specific to that localised area, they would be included, where necessary within the hierarchy of actions for instructing plant for balancing purposes.

4.4 Under the Grid Code (BC2.9.4.4), Emergency Instructions for nuclear generators to de-synchronise are generally avoided unless all other options have been exhausted. However, where nuclear plant has offered to be flexible, they may be instructed but not ahead of the Bid/Offer price stack which would contain prices from non nuclear plant.

4.5 There may be instances where cascade hydro schemes need to generate for environmental reasons (i.e. where a failure to allow water to pass through the scheme may give rise to a risk of flooding). There is a question as to whether instructions to nuclear generators should be taken before or after instructions to cascade hydro schemes in this instance.

5 Potential Solution

- 5.1 The issues highlighted in this consultation have resulted in a potential option which may be adopted by National Grid as System Operator. However, this is not a firm recommendation by National Grid and this consultation does not seek to prescribe the actual solution. Views are invited on this option, along with suggestions for other options which may be pursued.
- 5.2 The solution seeks to resolve the issues of avoiding instructing generators with high priced negative Bids and the ability to instruct generators outside the BM on commercial terms (and therefore avoiding emergency instructions). The solution does not seek to resolve the issues over why generators are submitting high priced negative Bids or choosing not to participate in the BM (e.g. choosing not to install EDL and/or submitting Bid prices). We are seeking views on these areas in section 6.

Developing a means of instructing generators outside the BM

- 5.3 As the BPS and Grid Code do not reference prohibitive Bids or sleeper Bids within the principles for issuing Emergency Instructions, there may be scope to introduce a more formal mechanism for instructing generation that is not active in the BM ahead of the acceptance of the prohibitive Bids. In these situations it would not be classed as an emergency, and would need appropriate remuneration provisions and suitable electronic despatch. The mechanism could include generation which can not participate in the BM (such as those with BELLAs) as well as those BMUs who choose not to actively participate in the BM, although it would be preferable (and likely to be more efficient) to see such generation participate directly in the BM. The priority for National Grid could therefore be as follows:
1. Valid, relevant and not prohibitively priced Bids
 2. Instructions to generators outside the BM
 3. Emergency instructions
 4. Generators with prohibitively priced Bids
 5. Instructions to nuclear generators
- 5.4 A second issue is the priority between generators which participate in the BM and those which don't participate and whether one can be prioritised over the other. Views are invited on this in Section 6.
- 5.5 The advantage of this instruction mechanism is that it retains separation from an actual Emergency Instruction and allows the despatching of generators which do not actively participate in the BM. This could result in lower balancing costs to the industry as less high priced negative Bids would need to be taken. However, this can also be seen as a disadvantage to embedded generation as it may create investor uncertainty as it could lead to loss of revenue during times of curtailment which could not be predicted.
- 5.6 The creation of an instruction to generators outside the BM would require changes to the following:
- Balancing Principles Statement
 - Grid Code
 - Balancing and Settlement Code

Possible payment mechanism for the above

- 5.7 Currently under an Emergency Instruction, generators which have no submitted Bid price (or unable to submit such a price) and are instructed off the system are not

recompensed. Therefore there may be an option to provide a payment to these generators which could, for example, be calculated based on the price of a Renewables Obligation Certificate (ROC) if the generation being curtailed is renewable (or some other opportunity cost for other generation). This would however raise a potential concern that parties without explicit Transmission Access rights (such as a BELLA) being compensated for loss of Transmission Access.

- 5.8 Under the Government Renewable Obligations scheme⁸, Suppliers are required to pay a buy out price to Ofgem if they do not present sufficient numbers of ROCs to meet their obligations under the scheme. As non BM participants may consist of renewable generation, the curtailment of such generation could cause issues for generators and suppliers. Therefore it can be considered that the buy out price of a ROC could be used to recompense generators which have been instructed off the system.
- 5.9 The advantage of providing payment to generators that do not participate in the BM is that less constraint costs would be passed to the industry if these were instructed ahead of prohibitively priced generators. Whilst the compensation might be less than the market rate for generators that were not instructed off the system, using the ROC pricing would ensure that generators receive equivalent income for the ROC. Note however that Suppliers (and potentially generators depending on the nature of bilateral agreements) could still be at a disadvantage by the loss of the physical ROC.
- 5.10 The creation of this option may require changes to the BSC due to the new payment mechanism; and systems would potentially have to be installed both at National Grid and also at the trading party's site, which could have a long lead time for implementation. Additionally, changes may be required to the Grid Code and also the BPS.

⁸http://www.decc.gov.uk/en/content/cms/meeting_energy/renewable_ener/renew_obs/renew_obs.aspx

6 Views Invited

6.1 This consultation has provided an overview of the issues encountered by National Grid and views are invited from the industry in response to the consultation generally but also the specific questions, as set out below:

1. Do you believe that the current balancing arrangements for wind are sufficient?
2. What are your views regarding the reasons for high priced negative Bids?
3. Should the balancing arrangements be amended to deal with high priced negative Bids (and high priced offers), for example to limit the potential exposure to BSUoS and/or imbalance charges, and if so, what would you propose?
4. Should the balancing arrangements be amended to better deal with inflexible or intermittent generation, and if so, what would you propose?
5. What are your views regarding the reasons for parties not choosing to install EDL / participate in the BM?
6. Should generation not able to participate in the BM be despatched via some form of commercial mechanism rather than emergency instructions? If so, what mechanism would you propose?
7. What do you believe should be the priority list for despatch? Please give reasons for your answer.
8. Should there be a threshold for high priced negative Bids (prohibitively priced Bids) in this priority list and, if so, what should the value be?
9. Should National Grid differentiate in any way the treatment of Users between local and wider constraints?
10. Do you have any other suggestions on how the balancing arrangements can be developed or improved?

If you have any questions relating to this consultation please forward these to

Balancing Services team (balancingservices@uk.ngrid.com)

Responses should be submitted to balancingservices@uk.ngrid.com by 17:00 on 18 October 2011.