Promoting choice and value
for all gas and electricity customers

National Grid Electricity Transmission System Operator Incentives from 1 April 2011

Final proposals

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Overview:

National Grid Electricity Transmission (NGET) is the System Operator (SO) for the electricity transmission system in Great Britain (GB). This document sets out our final proposals for an SO incentive scheme for NGET to apply from April 2011, including statutory licence modification consultations.

If NGET consents to our final proposals, and subject to responses to this consultation, the incentive scheme will be effective retrospectively from 1 April 2011 until 31 March 2013. If NGET does not consent to the licence modifications, thereby not accepting our final proposals, we will have to decide whether to consult again on revised proposals, to refer the matter to the Competition Commission, or to rely on our existing powers for the purposes of regulating NGET.

Context

These proposals form part of our work to regulate monopolies effectively. We consider that it is important for the electricity markets that the role of the System Operator (SO) is correctly identified and that the SO has the appropriate tools available to it to undertake this role.

Any interventions in the market by the SO can lead to costs being incurred, both directly by the SO and more widely by the market. Since customers ultimately bear these costs it is important to keep them as low as possible. Based on our experience over recent years, we consider that the best way of achieving the lowest costs to customers is by providing the SO with commercial incentives whereby it shares some of the gains (or losses) from cost reductions (or increases).

Associated documents

- 2010/11 Electricity System Operator Review – Preliminary Conclusions from Phase 1, 5 July 2010, Reference 80/10. http://www.ofgem.gov.uk/Markets/WhlMkts/EffSystemOps/SystOpIncent/Documents1/Phase%201%20recomendations%20doc%204.pdf

- Electricity SO Incentives Initial Proposals for 1st April 2011, National Grid, 24 November 2010.

- Addendum to the Electricity SO Incentives Initial Proposals for 1 April 2011: Modelling Transmission Constraints, National Grid, 13 December 2010.

- Ofgem's initial comments on National Grid's Electricity System Operator Incentives Initial Proposals, Ofgem, 15 December 2010. http://www.ofgem.gov.uk/Markets/WhlMkts/EffSystemOps/SystOpIncent/Documents1/Open%20letter%20re%20Ofgems%20view%20on%20NGETs%20proposed%20scheme%202011.pdf

- Electricity SO Incentives Initial Proposals for 1st April: Consultation Report, National Grid, 31 December 2010.

- A methodology for determining the ex-ante or ex-post treatment of modelling input, National Grid, May 2011.

- A methodology for the modelling of constraint costs, National Grid, May 2011

- A methodology for the modelling of energy costs, National Grid, May 2011.

Contents

Executive Summary

This document sets out our final proposals for the electricity transmission System Operator (SO) incentive scheme for National Grid Electricity Transmission (NGET) to apply from 1 April 2011 until 31 March 2013. We consider that our proposals represent a fair balance of risk and reward between NGET and its customers.

Ofgem's final electricity SO incentive proposals

In April 2010 we put in place a licence requirement for NGET to cooperate with a comprehensive review of its incentive methodology, including its models and modelling approach. As a consequence of our review substantial improvements have been made to the incentive methodology.

We are proposing to implement a two year incentive scheme based on this improved incentive methodology. We are also proposing that the scheme should be applied retrospectively from 1 April 2011. We have come to this position following consideration of NGET's Initial Proposals and the additional analysis that it has undertaken, responses to NGET's Initial Proposals and our own analysis (aided by an independent consultant).

A key aspect of the improved methodology is that it will allow NGET to take into account the impact of unpredictable and uncontrollable external factors affecting its cost base, thereby reducing the scope for windfall gains and losses. This will be done by allowing the incentive target to be adjusted at the end of the scheme period for these factors. This means that NGET will be incentivised to more actively control the costs within its control and that action it undertakes to reduce its costs are not diluted by external factors. This is a particularly important development given the potential benefits we see in developing multi year incentive schemes.

Importantly, the models that we are proposing to use as part of the incentive scheme have been redeveloped to more accurately capture the drivers of NGET's costs relative to previous schemes. Specifically, NGET has improved its modelling of energy costs and has replaced its suite of bespoke constraints models with a single model that considers the GB system as a whole.

The proposed incentive methodology will ensure that NGET remains incentivised to operate in an economic and efficient manner. NGET will continue to be incentivised to beat a target, although this final target cost will only be known at the end of the scheme, once the impact of unpredictable and uncontrollable external factors has been taken into account.

We recognise that the proposed approach to incentivisation outlined in the final proposals represents a significant change relative to previous SO incentive schemes. We consider that the proposal improves both the accuracy and the transparency of the scheme and reduces the scope for windfall gains and losses. We also consider that it will:

- allow NGET to take a more strategic view of its operation of the electricity system;
- strengthen NGET's incentives to reduce costs;
- incentivise NGET to consider actions that have higher upfront costs which will be paid back over a longer period;
- allow for greater alignment with other regulatory decisions, such as RIIO–T1; and
- reduce the administrative burden in the longer term.

Given the change in the proposed methodology, particularly its capacity to reduce the scope for windfall gains and losses, we are proposing that the parameters of the incentive scheme change. We consider that for this two year incentive scheme that the sharing factors can be strengthened, the caps and collars increased and the deadband reduced:

Deadband	Upside sharing factor	Downside sharing factor	Profit cap /loss floor
±£5m[1]	25%	25%	£50m

Despite the improvement in the incentive methodology outlined in these final proposals we are looking to impose new licence conditions on NGET to work with us to further refine its methodology. These refinements have been identified as part of the process associated with the further development of this scheme. We consider that these refinements are likely be to the ultimate benefit of consumers.

Next Steps

Subject to responses to this consultation, if NGET consents to these final proposals the licence modifications will take effect retrospectively from 1 April 2011. If NGET does not consent, we will have to decide whether to consult again on revised proposals, refer the matter to the Competition Commission or rely on direct regulation of NGET's SO costs based on our existing powers.[2] We will be publishing a consultation document in June 2011 setting out our initial views with respect to the incentivisation of NGET as SO from 1 April 2013.

[1] For example, if the Incentivised Balancing Cost for the scheme was £1b, a deadband of ±£5m would mean that NGET would not be incentivised between £995m and £1.005b.

[2] A new licence modification and appeals process applicable to standard, standard special and special licence conditions for gas and electricity will be introduced as part of the Third Package of energy reforms. At the time of publication, it is expected that the implementing Regulations will not come into force until autumn 2011. In the event that a licence modification referral is made pursuant to section 12 of the Electricity Act 1989 to the Competition Commission before the implementing Regulations come into force then the provisions of section shall continue and the reference shall be considered and reported on by the Competition Commission.

1. Background

Chapter Summary

This chapter provides background on the process so far and the proposed way forward.

Question box

Question 1: There are no specific questions in this chapter.

Background

1.1. National Grid Electricity Transmission (NGET), a subsidiary of National Grid plc (NG), is the system operator (SO) for the high voltage electricity transmission system in Great Britain (GB). It is responsible for making sure that electricity supply and demand stay in balance and the system remains within safe technical and operating limits.[3] The transmission licence of NGET requires it to act in an efficient, economic and co-ordinated manner in performing its role. In addition to its licence requirement, we also incentivise NGET financially to operate the electricity system in the most economic and efficient manner.

1.2. Since 2001, when the New Electricity Trading Arrangements were introduced, electricity SO incentive schemes have taken the form of a single target for the Incentivised Balancing Cost (IBC) with sharing factors, a cap and a floor.[4] The incentive schemes for each year along with outturn payments to/from NGET are shown in Table 1.1.

1.3. In recent years, and particularly since the introduction of the British Electricity Trading and Transmission Arrangements in 2005, electricity SO costs have generally risen and become more volatile. As a result, it has become increasingly difficult to set an appropriate target and parameters for the SO incentive scheme. At the same time, it has become ever more important to provide appropriate incentives on NGET to manage SO costs efficiently in the face of new challenges giving rise to potentially higher and more volatile SO costs.

[3] NGET is also the owner of the high voltage electricity transmission network in England and Wales. In Scotland, the transmission networks are owned by Scottish and Southern Energy and Scottish Power.

[4] If NGET's external costs are below (or above) the IBC target, NGET receives a percentage of the saving (or pays a percentage of the excess cost) determined by the sharing factor. The cap and floor are the respective maximum payment and loss that NGET is permitted to receive (or pay) due to the SO incentive scheme. A deadband has also been used in recent years to manage the uncertainty associated with an agreed ex ante forecast of incentivised costs.

Table 1.1: Historical external SO incentive schemes[5,6]

	Target IBC £m	Sharing factors		Cap £m	Floor £m	Payment to / from NGET £m	Actual IBC £m
		Upside (%)	Downside (%)				
2001/02	382	40	12	46.3	–15.4	46.3	263
2002/03	367	60	50	60	–45	48.6	286
2003/04	340	50	50	40	–40	32.2	281
2004/05	320	40	40	40	–40	12.2	289
2005/06	378	40	20	40	–20	–4.0	427
2006/07	No scheme agreed[7]						495
2007/08	430–445	20	20	10	–10	–1.2	451
2008/09	530–545	25	25	15	–15	–15	827
2009/10	586.43–616.43[8]	25	15	15	–15	15	417
2010/11	511.1–566.1[9]	15	15	15	–15	15	282[10]

1.4. In May 2009, we published an Open Letter[11] that noted that continuing with predominantly annual incentive schemes was not optimal and that longer term schemes had more benefits. We considered that longer term incentives would, amongst other factors, encourage longer term actions, increase information transparency, reduce administrative burden and facilitate alignment with the transmission price controls from 1 April 2012 (now 2013).

The SO review

1.5. As part of setting the 2010 electricity SO incentive scheme, a special licence condition (AA5I) was placed on NGET in relation to a review of its methodology. The SO review had three objectives:

- in terms of the methodology: to develop an appropriate methodology for an SO incentive scheme suitable for application to multi year incentive schemes;

[5] Targets and actual IBC before 2005–06 have been recalculated to include net transmission losses.
[6] All data in money of the day.
[7] In 2006–07 NGET and Ofgem did not agree on an IBC target. Ofgem proposed two schemes, one with a target of £390m, the other with a target of £410m. NGET's IBC forecast at the time was £451m for 2006–07. As NGET did not consent we chose to monitor this aspect of NGET's activities, rather than refer this issue to the Competition Commission.
[8] The target was amended from £600–630m in November 2009, as a result of the implementation of automatic adjusters put in place at the time the scheme was agreed. The use of automatic adjusters also makes direct comparison between years more difficult.
[9] The target was amended from £550–605m in December 2010, as a result of the implementation of automatic adjusters put in place at the time the scheme was agreed.
[10] This amount is subject to final reconciliation.
[11] This open letter is available at: www.ofgem.gov.uk.

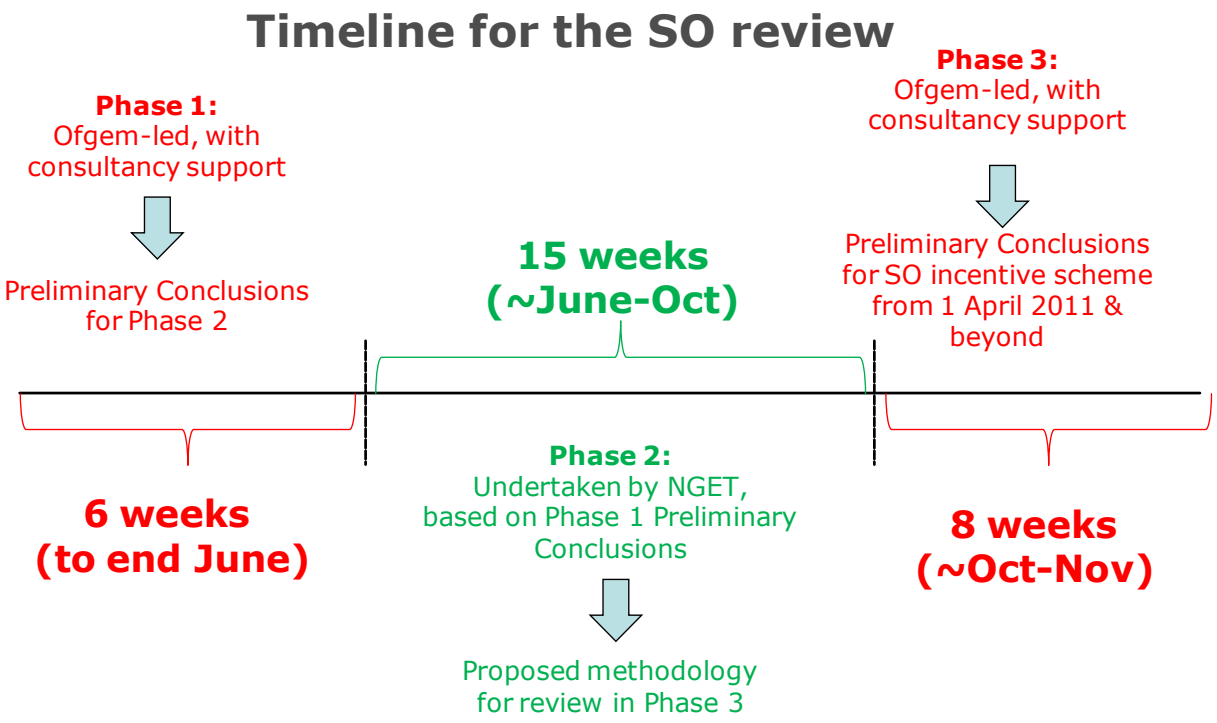
- in terms of the modelling: to develop NGET's modelling tools to provide reliable analysis to support setting scheme parameters for the given methodology; and
- in terms of the application: to develop a workable approach for the application to a SO incentive scheme for implementation on 1 April 2011.

1.6. Ofgem led the review process which involved three phases:

- Phase 1: related to Ofgem examining NGET's current methodology and considering its appropriateness for the development of multi year incentive schemes
- Phase 2: related to NGET developing its methodology and modelling approach based on Ofgem's preliminary conclusions from Phase 1
- Phase 3: related to Ofgem reviewing the methodology put forward by NGET under Phase 2.

1.7. The original timescales for, and the interactions between, the three phases of the SO review is illustrated in Figure 1.1.

Figure 1.1: Phases of the SO review



1.8. On 5 July 2010, we released our 2010/11 Electricity System Operator Review – Preliminary Conclusions following Phase 1 (Preliminary Conclusions). The

Preliminary Conclusions proposed a new incentive methodology to enable multi year schemes to be implemented.[12] Amongst other issues, it outlined that NGET should:

- improve its energy models, including updating the inputs and calculations within its models and the relationships within its models;
- replace its current suite of constraints models with a GB-wide fundamental model to allow an unconstrained and constrained schedule based on the merit order across GB to be derived on an internally consistent basis; and
- improve its methodology to allow implementation of a SO incentive scheme suitable for application to multiple years – this included improving the approach it used to select data for use in its models and improving how to control for inputs that are difficult to control and forecast.

1.9. Phase 2 of the SO review was scheduled to finish on 15 October 2010, with NGET being required to submit its proposed methodology for a multi year electricity SO incentive scheme by that date. However, delays with NGET's analysis prevented it from delivering the constraint components of its proposed methodology on time.

1.10. On 24 November 2010, NGET published its Initial Proposals (IP). However, within the IP it noted that it would release, in December 2010, an addendum on its approach to modelling constraint costs. Following the release of this document NGET held an Electricity SO Incentives workshop in London. It also published a constraints addendum. NGET received eight responses to its IP and constraints addendum. [13]

1.11. On 15 December 2010, we published an Open Letter[14] providing our initial comments on the IP. In that letter we noted, amongst other factors, that:

- NGET appeared to have considered the Preliminary Conclusions;
- we were encouraged to see that NGET had proposed a two year scheme; and
- the proposed governance arrangements appeared reasonable (at that stage).

1.12. On 15 February 2011, NGET provided industry with its thoughts on the level of Balancing Services Use of System charges costs in 2011–13. These cost scenarios were based on hypothetical ex post data.

1.13. On 31 March 2011, we released a letter to industry outlining that NGET had experienced delays in developing its methodology and that we had determined that it was not appropriate to put forward final proposals at that time. We also noted that

[12] This document is available at: www.ofgem.gov.uk/Markets/WhlMkts/EffSystemOps/SystOpIncent/Documents1/Phase%201%20recomendations%20doc%204.pdf

[13] Respondents to NGET's IP and Constraints addendum were: Centrica; EDF; E.ON; International Power; RWE; Scottish and Southern Energy; Scottish Power; and RenewableUK. Respondents' submissions are available at: www.nationalgrid.com/uk/Electricity/soincentives/docs/.

[14] This open letter is available at: www.ofgem.gov.uk.

we were continuing to work with NGET to complete the required analysis in a timely manner.

1.14. Ofgem has since scrutinised NGET's proposed incentive methodology and the results of which are contained within this document. Importantly, this document also represents the conclusion of Phase 3 of the SO review. In coming to our views we have undertaken our own analysis, have considered the IP, the views of the independent consultant engaged to assist us, material subsequently provided by NGET and the views of respondents' to the IP.

1.15. Importantly, NGET is still in the process of verifying the accuracy of the proposed constraint cost modelling calculations. We are therefore consulting on the basis that this verification process does not result in material changes to the overall scheme.

Structure and approach

1.16. This final proposals document consists of six chapters. This chapter provides the background to our proposals, outlines the process we followed in developing the SO incentive scheme for NGET from April 2011, and sets out the structure of the document and next steps.

1.17. In chapter 2 we discuss the incentive methodology to apply from 1 April 2011. In chapter 3 we discuss the approach to modelling energy and constraint costs to apply from 1 April 2011. In chapter 4 we discuss the scheme design and governance arrangement to apply from 1 April 2011. In chapter 5 we discuss the transmission losses and black start service targets to apply from 1 April 2011. In chapter 6 we summarise the issues explored in earlier chapters. In all relevant chapters we explain how our final proposals have been informed by the IP, the views of market participants and the additional information provided by NGET.

Next steps

1.18. Appendix 2 of this document contains a statutory notice of our proposal to modify by agreement NGET's electricity transmission licence under section 11 of the Electricity Act 1989. This statutory modification notice proposes to implement the proposals set out in this document (subject to responses to this consultation).

1.19. We welcome the views of interested parties on our proposed modifications. Responses should be sent to gb.markets@ofgem.gov.uk and should be received no later than 8 July 2011. Details of how to respond can be found in Appendix 1.

1.20. Section 11 of the Electricity Act 1989 specifies a period of not less than 28 days during which interested parties can make representations or objections to the proposed licence modifications, and during which the Secretary of State may direct us not to make the proposed modifications. Following any such

representations, objections or direction, we may make such revisions to the proposed licence modifications as we consider appropriate and carry out a further statutory consultation on the new proposed licence modifications.

1.21. NGET must consent to the proposed modifications to its licence before they can be implemented. If NGET does not consent to the proposed licence modifications we can consult on revised proposals or refer the proposed SO incentive scheme modifications to the Competition Commission for final adjudication. Alternatively, we could allow the incentive schemes to fall away.

1.22. If the incentive scheme falls away, NGET will be able to pass through the costs of operating the system to the parties using it. We would, however, continue to monitor the performance of NGET as SO under the relevant licence conditions. For the avoidance of doubt, in the event that we found that NGET was not operating its system in an efficient economic and coordinated manner we could still take enforcement action notwithstanding the absence of a SO incentive scheme.

1.23. If NGET consents to the proposed licence modifications, we intend, subject to any representations made during the consultation and any direction received from the Secretary of State, to direct the relevant modifications to NGET's transmission licence in line with the proposed licence modifications shortly after 8 July 2011. The new licence conditions would apply retrospectively from 1 April 2011. We consider that this would have no detrimental effects on the incentive scheme.

1.24. While we consider that our proposals for the SO incentive scheme to apply from April 2011 represent a fair reflection of risk and reward between NGET and customers, we consider that further refinement to this approach is possible. We are therefore proposing to introduce a licence condition on NGET to require it to refine its incentive methodology.

1.25. We are also currently considering longer term options for the incentivisation of NG's gas and electricity SO roles that align with RIIO–T1 from April 2013. We consider there are advantages from aligning the incentives on NG as SO with the incentives on the Transmission Owners in recognition of the interactions between these roles. We expect to publish an initial consultation document on options for longer term SO incentive arrangements shortly.

2. Incentive methodology

Chapter Summary

This chapter outlines NGET's proposed incentive methodology for electricity external SO costs for 2011–13. It provides our views on NGET's proposed incentive methodology to apply from April 2011.

Question box

Question 2: Do you consider that the final proposals' proposed incentive methodology for the SO incentive scheme is reasonable?

Question 3: Do you consider that the proposed licence modifications appropriately reflect the final proposals as described in this chapter?

Background

2.1. In the 2010/11 Electricity System Operator Review – Preliminary Conclusions following Phase 1 (the 'Preliminary Conclusions'), we outlined improvements we considered necessary for the development of a SO incentive scheme suitable for application to multiple years. Specifically, we outlined that NGET needed to improve its methodology so that the incentive target could be adjusted to take account of unpredictable and external factors, reducing NGET's exposure to windfall gains and losses.

2.2. We considered NGET's proposed models could include ex post actuals as inputs if NGET did not have any control over them.[15] We considered this was particularly important, especially if the scheme was to be implemented for any longer than a year, as multi year schemes could increase the level of uncertainty and therefore the scope for windfall gains and losses. In practice, we considered this would mean that while NGET would develop a forecast of energy and constraint costs at the start of the scheme, the final target for external costs would be determined at the end of the scheme period, once the outturn values of volatile and unpredictable cost drivers (ex post inputs) had been taken into account.

2.3. Given the significance of the changes we proposed in the Preliminary Conclusions we considered that NGET should, as part of Phase 2, provide criteria by which to assess which inputs should be considered on an ex ante basis and which on an ex post basis. We therefore asked NGET to put forward criteria for identifying ex ante and ex post inputs. We also noted that NGET should improve its methodology for estimating ex ante inputs.

[15] The only exception to this would be variables that NGET can control to some extent but which are too difficult to forecast.

2.4. We also recommended that NGET should undertake a number of improvements to its energy and constraints modelling, including:

- re-examining the relationships between underlying cost drivers and costs themselves;
- improving the approach it used to select data for use in its models;
- improving how to identify inputs that are difficult to control and forecast; and
- replacing its suite of bespoke constraints models with a GB-wide model based on economic fundamentals.

2.5. We considered that the design of the scheme should include a number of specific features. In summary, we outlined that the scheme should be bundled, be suitable for application in a multi year scheme and, provided our recommendations were adopted, reduce NGET's exposure to windfall gains and losses, thereby allowing for higher profit caps, loss floors and sharing factors and reduce the need for a deadband. Importantly, we noted that NGET would remain incentivised against a target of costs.

2.6. In proposing these improvements, we recognised that the development of a suitable incentive methodology would be difficult. However, we considered that this was necessary to ensure NGET's actions were efficient over both the short and long run. We also noted that the development of a new methodology was closely linked to, and largely dependent upon, other improvements to NGET's modelling approach. Importantly, we noted that any improvements made to NGET's incentive methodology should lead to cost reductions that could be passed on to consumers over the long term.

2.7. By adopting this new methodology we considered that the incentive regime would retain the incentive on NGET to manage the impact of its cost drivers efficiently. That is, it would ensure that NGET's performance was measured by how efficiently it carried out it actions, taking into account the external factors that it faced. This would mean that the incentive would be focused on NGET's behaviour rather than achievement of a cost 'number', which would be exposed to external factors beyond its control.

NGET's proposed methodology

2.8. NGET's proposed methodology sought to address the findings outlined in the Preliminary Conclusions. Specifically, in its IP it proposed a methodology that it considered would allow the implementation of a multi year SO incentive scheme as it:

- replaced difficult to forecast cost drivers that are outside of its control with actual values (ex post inputs) in its models;
- re-examined and re-specified many of the relationships between its costs and the factors that affect them (cost drivers); and
- improved the approach it uses to select data for use in its models.

2.9. For example, while forecasts will be produced for all of NGET's cost components (and these forecasts will be based on relationships that have been re-examined and often re-specified) NGET's proposed approach permits factors outside of its control (e.g. market length[16]) to be replaced with ex post actuals.[17] NGET will then use this combination of forecast and actual data in its model to derive its final cost target.

2.10. NGET noted that under its approach no IBC target would be agreed between it and Ofgem prior to the start of the scheme – rather, it would be the relationships between NGET's external cost drivers and its costs that would be agreed with Ofgem. Consequently, NGET noted that its final cost target would only be known at the end of the scheme, once the uncontrollable external factors affecting its cost base were known and had been reflected in the model.[18]

2.11. NGET noted that its proposed methodology was an expansion of the previous approach to adjusting incentivised cost targets, which was based on the use of a single automatic adjuster (the Net Imbalance Adjustment) and additional ad hoc adjusters to manage specific areas of risk.

2.12. Given the significance of replacing volatile and difficult to forecast data with actual data, NGET proposed criteria by which it could assess which inputs to its cost models should be forecast at the beginning of the scheme (ex ante inputs) and which should be input at the end of scheme using actual data (ex post inputs).

2.13. Specifically, NGET explored the mechanisms it considered it could use to influence its cost drivers. For each input, NGET considered that its ability to forecast should be based on the availability of data, the volatility of drivers and the applicability of historic data trend analysis. It then considered the tools it had at its disposal to manage or influence the requirement for, and cost of, the actions it takes for SO purposes.[19] It noted that the greater the degree of control, the more suitable a tool is likely to be for incentivisation.

2.14. NGET identified six categories of BSIS costs to structure its assessment of the underlying cost drivers.[20] These categories formed a framework in which each cost driver could be assessed for suitability as an ex post or ex ante input based on its

[16] Whether as a result of levels of generation or demand the market itself is short or long.
[17] The only exception to this would be variables that NGET can control to some extent but which are too difficult to forecast.
[18] That said, on 15 February 2010, NGET released information that outlined where its BSUoS costs may be for 2011–13. Its estimates were based on hypothetical ex post variables though it is important to recognise that these target costs are not part of the proposed scheme. The latest available estimates for BSIS costs are available Appendix 6.
[19] Key tools NGET considers that it can use to control inputs are: the balancing mechanism, trades, balancing services contracts, transmission system planning/operation, changes to operating policy, changes to industry codes and information provision.
[20] The six categories are generation availability, generation running, demand level, demand volatility, transmission availability and transmission capability.

overall effect on BSIS costs. NGET considered that this framework could also be used to assess any new cost drivers that may be identified. Importantly, NGET also developed an ex ante and ex post methodology statement to help explain its approach by which it determines whether a variable should be considered as an ex post or an ex ante variable. This methodology is available on NGET's website.

2.15. In terms of how this distinction between inputs would work in practice, NGET proposed that:

- ex ante inputs would be set prior to the start of the scheme in the same way as the current scheme. This would mean that the same dataset would be used whenever the models were run and would not normally be updated during the scheme; and
- ex post inputs would be collated on a monthly basis and, combined with the ex ante dataset, would be run through its models to determine the target level of costs that it is incentivised against.

Respondents' views on NGET's proposed methodology

2.16. Most respondents welcomed NGET's efforts to improve the modelling of SO external costs and their underlying drivers. The majority of respondents also supported the principle of using ex post model inputs in areas where NGET had no control. However, all of those that supported NGET's efforts qualified their support, by noting the need for continued scrutiny of the modelled relationships, noting that where inputs cannot currently be forecast with confidence NGET should be incentivised to improve its forecasting ability or recommending that the scheme should only be implemented for one year to 'test' the new methodology.

2.17. A number of other concerns with NGET's proposed methodology were expressed by respondents, including the length of time provided to consult on the proposed methodology (which resulted in their submissions being less robust than they possibly could have been), the transparency of the scheme (which respondents also considered limited the scope for them to provide detailed comments), the strength and therefore appropriateness of the relationships determined by NGET, the length of the proposed scheme (including issues around the scope for alignment of SO and TO incentive schemes), and the proposed scheme parameters. While a number of these concerns are explored below, issues surrounding the strength of identified relationships are explored in chapter 3 while issues around the duration of the scheme and scheme parameters are explored in chapter 4.

Ofgem's views on NGET's proposed methodology

2.18. We consider that NGET's proposed methodology is suitable for implementation for a period greater than a year. We consider it is suitable as it has met the requirements set out in the Preliminary Conclusions by:

- re-examining and re-specifying many of the relationships between its costs and the factors that affect them;
- proposing an approach to incentivisation that would replace the volatile and difficult to forecast cost drivers with actual values (ex post inputs);
- improving the approach it uses to select data for use in its proposed models, including the development of criteria to determine which inputs should be treated as ex ante or ex post; and
- replacing its suite of bespoke constraints models with a GB-wide model based on economic fundamentals.

2.19. We consider that these improvements in NGET's incentive methodology will ensure it is appropriately incentivised to operate the system in a cost efficient manner over a period greater than a year. Importantly, we consider that these changes should ensure that NGET is less exposed to windfall gains and losses and that it will allow for strengthened incentives to be placed on it. For example, we consider that this methodology will reduce the need for a deadband within the SO incentive scheme (an area within which NGET is not incentivised) and increase the level of payments that is available to and from NGET. We consider that any savings that will accrue will be able to be passed on to consumers via reduced charges to system users.

2.20. We consider that NGET's proposed approach will, in general, ensure that it remains incentivised to continually improve its performance. We consider that the use of ex post variables to control for factors outside of its control will ensure that it is focusing its effort to improve efficiency in areas where it has some control. We note that just because a variable is treated as ex post it does not mean that NGET has no incentive in relation to the impact of the variable on costs in general. Rather, it means that:

- NGET will not be exposed to uncontrollable volatility in the variable itself; and
- actions undertaken by NGET to reduce its costs are not diluted by changes in factors that are outside of its control.

2.21. We also see merit in NGET's criteria for deciding whether a variable should be ex post or ex ante. We consider that it provides a sufficiently robust framework for consideration of both current and new cost drivers.

2.22. Notwithstanding the use of specific criteria there is one clear exception to the use of the proposed criteria and that is the use of ex post prices for actions taken in the Balancing Mechanism (BM). We consider there are a number of issues associated with the proposed use of ex post BM prices for constraint costs that warrant caution – this issue is explored in chapter 3.

2.23. We note and agree with the concern raised by several respondents that NGET should not be allowed in principle to consider inputs as ex post purely on the grounds that they are difficult to forecast. This concern was specifically raised with respect to the wind input, which NGET proposed to treat as an ex post input due to difficultly in forecasting this particular input.

2.24. We consider that the proposed methodology continues to provide an incentive for NGET to improve its planning and forecasting activities (as part of the margin and constraint models). However, we will continue to expect NGET to improve its forecasting and planning capabilities, particularly with respect to wind, given that wind connections are expected to increase going forward. We therefore intend to place a licence requirement on NGET to improve its modelling capability, including with respect to its ability to model the impact of hydro and wind generation – see chapter 6.

2.25. We note the concerns raised by respondents regarding the level of consultation allowed by NGET on the IP and the level of transparency associated with aspects of NGET's proposed methodology. In terms of the level of consultation provided, we accept that ideally the timeframe permitted for consultation would have been greater and we will be encouraging NGET to improve its planning to address such issues going forward. However, we also note that NGET undertook a number of presentations on its proposed approach and volunteered to provide interested parties with one-on-one discussions on any aspect of its proposals. With respect to transparency, we note the concerns expressed by respondents but consider that the level of detail that was, and will be, available to industry through this approach is an appropriate balance between the needs of industry and Ofgem and the level of information that can be released without undermining NGET's ongoing responsibility as SO.

2.26. We also consider that NGET's proposed approach is more transparent relative to the approach that was previously adopted. Relationships between costs drivers and costs have been reconsidered and the variables that are used, and the sources of data are outlined in the methodologies that underpin the proposed approach. For example, we welcome NGET's development of an ex ante and ex post methodology – we consider this is a significant improvement on the current approach and will help reduce the 'black box' concern identified in the Preliminary Conclusions. We also note that NGET will be releasing for consultation three methodologies to explain and support its proposed approach – these methodologies are available on NGET's website.[21]

2.27. More broadly, we consider that NGET's proposal for a multi year scheme increases the scope for benefits to arise from longer term action, information revelation and administrative costs. This is particularly important given the interaction with RIIO–T1. We consider there are advantages from aligning the incentives on NGET as SO with the incentives on the Transmission Owners in recognition of the interactions between these roles.

[21] The three methodologies that NGET has developed are: (1) a methodology for determining the ex-ante or ex-post treatment of modelling input; (2) a methodology for the modelling of constraint costs; and (3) a methodology for the modelling of energy costs.

3. Modelling energy and constraint costs

Chapter Summary

This chapter outlines NGET's proposed approach to modelling energy and constraint costs as part of incentive methodology for electricity external SO costs for 2011–13. It provides our views on NGET's proposed approach to modelling energy and constraint costs as part of its incentive methodology.

Question box

Question 4: Do you consider that the approach to modelling energy and constraint costs as detailed in the final proposals are reasonable?

Question 5: Do you consider that the proposed licence modifications appropriately reflect the final proposals as described in this chapter?

Background

3.1. The previous SO incentive scheme grouped SO costs in a number of cost components corresponding to the range of actions the SO takes. Specifically, NGET used one model to forecast a range of energy related costs[22], with the constraint costs[23] forecast using a suite of bespoke models.[24]

Energy cost modelling

3.2. In terms of estimating energy related costs, NGET previously used estimates of volumes and prices to calculate forecasts of costs. These estimates were based on a combination of historic evidence and future expectations. Examples of inputs into the model included: historic distribution of Net Imbalance Volumes (NIV i.e. market length); expectations of future NIV; forward prices of power and gas; historic relationships between prices on the power exchanges and the prices paid by NGET for actions in the BM; historic breakdown of actions by fuel type, and the expected level of wind generation on the transmission system.

[22] In terms of energy related SO costs there are seven main components – energy imbalance, margin, footroom, response, fast reserve, reactive power and black start. Transmission losses are also included in the SO incentive but these are modelled separately. Black start and transmission losses are explored in chapter 5.

[23] A constraint arises where the system is unable to transmit the power supplied to the location of demand due to congestion at one or more parts of the transmission network. In the event that electricity is unable to flow in the way required, NGET will take action to either increase or decrease the amount of electricity at different locations on the network.

[24] NGET used five models to forecast constraint costs in 2010–11, with each of these models referring to different regions and/or outages.

3.3. The Preliminary Conclusions outlined a number of areas of NGET's energy modelling that required improvement if it was to be used in a multi year scheme. The key area of improvement was however improving the relationship between the drivers of NGET's costs and the costs themselves, for example, the relationship between NIV and margin volumes and hence margin costs.

3.4. We also outlined that NGET could improve the reliability of its modelling to provide a more solid foundation for the adoption of a new framework by:

- giving further consideration to how the inputs into its model are forecast[25];
- streamlining its models, particularly in areas where developments may have occurred over time and may have become redundant;
- determining the appropriate granularity for calculations, particularly for those models which may use a combination of ex post and ex ante input variables; and
- taking forward specific improvements to components of the energy model relating to margin costs and the level of free margin available as a result of the length of the market (i.e. the extent to which the market is long or short).

3.5. Other, more general, modelling concerns we identified included:

- the models were very detailed and essentially a 'black box';
- the outputs of the energy model were very sensitive to the inclusion of a few additional historic values; and
- the calculations within the models did not give sufficient consideration to the underlying relationships in the data and the extent to which this may be particular to prevailing market conditions or the extent to which the underlying drivers might change going forward.

3.6. Given these concerns we had limited confidence in NGET's models being used as the basis of a longer incentive scheme. We noted that our proposed improvements should be seen as prerequisites for the adoption of any ex post inputs to the energy model and that it would be necessary for NGET to address issues in relation to the extension of the modelling horizon.

Constraint costs modelling

3.7. In terms of estimating constraint costs, NGET's previous models first calculated the expected volumes – making several assumptions about key variables such as local demand, conventional, new and wind generation and transmission

[25] This included consideration of available granularity of input data versus required granularity of forecast data: whether to specify inputs directly and if so what data sources to use; whether to model uncertainty using multiple scenarios and/or Monte Carlo simulation and in the latter case what is the probability distribution and central values used in this; whether to calculate the model inputs directly from modelled relationships and what the basis for those calculations should be, including the role of historical and forward looking information in formulation or applying such relationships.

outages. The models then calculated the costs of resolving the constraints by multiplying the expected volume of constraints with the expected price of resolving the relevant constraint – this price was based on assumptions about the BM bid and offer prices, margin prices, long term contract and intertrip prices that NGET had with several generators. These prices were based on forward looking data but also on NGET's judgement of future market conditions.

3.8. In the Preliminary Conclusions, we outlined that our proposed way forward was for NGET to develop a GB-wide fundamentals model in which a fully functioning dispatch model would be used to schedule plant according to marginal costs. We considered this would enable an unconstrained and constrained schedule across GB to be derived on an internally consistent basis. We also noted that such a model would increase transparency on constraint costs, thereby informing future work in other areas, such as the impact on constraint costs of, for example, the connect and manage arrangements for transmission access.

3.9. We proposed that any new constraint costs model should consider the expected costs of resolving any constraint, taking into account the options available to NGET. We noted that the revised modelling approach needed to ensure that the incentive remained on NGET to resolve constraints in the most efficient and economic manner.

3.10. We outlined that in modelling the constrained schedule, NGET would need to consider whether the cost of resolving a specific constraint should include any premiums paid for certainty as part of a contract.

3.11. We also expected NGET to specify this model such that changes to the generation background and developments to the transmission network could be accommodated in a robust and transparent way, including decisions taken at the SO/TO interface affecting transmission boundaries. Finally, we noted that there may be scope for NGET to develop its models to provide improved modelling of wind generation – however, we recognised this could be difficult within the timeframes available.

NGET's proposed approach – energy cost modelling

3.12. Consistent with the Preliminary Conclusions, NGET's approach to modelling energy costs focused on re-examining and re-specifying many of the relationships between its costs and the factors that affect them, and improving the approach it uses to select data for use in its proposed models. It also looked to improve the energy imbalance forecast model, develop new margin models and simplify the frequency response, fast reserve, and footroom models.

3.13. NGET outlined that it had used:

- regression analysis to determine the type and strength of relationships between variables;

- a range of statistical methods to test the statistical significance of the chosen variables ('the goodness of fit'); and
- historical outturn data, along with modelled data, to demonstrate that its models reflected, as closely as possible, the real cost of system operation ('back testing').

3.14. NGET also proposed that the relationships between the chosen variables within the models that form part of the methodology would be agreed at the start of the scheme. Therefore, each of NGET's energy models will comprise an ex ante defined relationship between a number of variables. The variables themselves will comprise a number of ex ante and ex post inputs. These defined relationships and variables will be used throughout the duration of the scheme to calculate a cost target for balancing services.

3.15. The final value of the cost target will be calculated at the end of the scheme period, once the values of all ex post inputs are known. NGET will be incentivised against this final target. The latest estimate of energy balancing costs is given in Appendix 6, though it is important to note that these values do not constitute the final target against which NGET will be incentivised.

3.16. NGET produced an energy model methodology to provide a more technical explanation of its modelling approach – this document is available on NGET's website. More detailed information on NGET's energy models is also available in Appendix 3.

Respondent's views – energy cost modelling

3.17. The majority of respondents supported the principle of using ex post model inputs as part of the incentive methodology in areas where NGET had no control over or ability to forecast. However, all qualified their support by either noting the need for continued scrutiny of the modelled relationships or noting that where inputs cannot currently be forecast with confidence NGET should be incentivised to improve its forecasting ability.

3.18. All respondents stressed the need for continued review of NGET's models and the relationships that underpin them. Some questioned whether the relationships presented were sufficiently robust, while one suggested the models should pay greater attention to improving wind generation forecasts.

3.19. Respondents suggested a number of ways for industry to gain assurance over the quality of models. Some called for the establishment of an industry-led 'expert group' while others considered that Ofgem should be responsible for reviewing NGET's modelling in detail.

3.20. Many respondents noted the need for further detail/analysis and greater transparency, as well as more time to provide a meaningful response to the consultation.

Ofgem's views – energy cost modelling

3.21. We consider that NGET has significantly improved its energy cost models and that they are fit for use in a multi year scheme. NGET has, for example, re-examined and re-specified many of the relationships between its costs and the factors that affect them, and has improved the approach it uses to select data for use in its proposed models. NGET has also improved the energy imbalance forecast model and the margin models, and has simplified the frequency response, fast reserve and footroom models. More information on NGET's proposed approach to modelling, including the data it has used is outlined in the three methodologies that it has developed to help explain and support its proposed approach – these methodologies are available on NGET's website.

3.22. One of the concerns we set out in the Preliminary Conclusions was NGET's exposure to windfall gains and losses associated with factors outside its control and whether this was preventing the implementation of longer terms schemes. We note that the proposed methodology largely mitigates this risk through the use of ex post inputs for such factors, including market length, wholesale power price and market provided headroom. Information on the inputs we consider should be treated as ex post and which should be treated as ex ante inputs is set out in Appendix 4.

3.23. Another concern identified in the Preliminary Conclusions was that NGET's estimates of costs were very sensitive to small changes (one or two months) in the size of the sample period used to estimate costs. In discussions with us NGET agreed to resolve this issue by constructing its energy cost models using six years of data (April 2005 to March 2011).[26] We consider this approach improves the robustness of the modelled relationships, making them less susceptible to changes in data from one year to the next within the sample period.

3.24. The Preliminary Conclusions also identified that the calculations within the models that NGET used to estimate energy costs did not give sufficient consideration to the underlying relationships. NGET's proposed methodology has largely addressed these concerns – it has tested alternative relationships, adjusted the models or sample period to take account of structural changes and has proposed the use of historic average values in cases where a robust relationship could not be found.

3.25. However, there are some areas of NGET's proposed approach that we consider would benefit from further refinement – these refinements would help generate benefits that could be to the ultimate benefit of consumers. For example, we consider that there may be merit in NGET trying to develop a short term forecast of wind generation, so that wind output can be an ex ante input (instead of ex post). We consider that this refinement could ensure that NGET would be better incentivised to procure balancing services in an economic and efficient manner.

[26] While the sample period of April 2005 to March 2011 was chosen for most models, some models (such as margin volume and fast reserve bid price) feature different periods to take account of structural changes in the data.

3.26. As part of our monitoring of NGET's SO operations, we will continue to review performance under the scheme throughout the incentive period. We will also review the performance of NGET's models against actual data and costs on an ongoing basis.

NGET's proposed approach – constraint cost modelling

3.27. NGET considered that it had addressed the concerns raised in the Preliminary Conclusions – it replaced its current suite of constraint cost models with a single fundamentals based model that would consider the GB system as a whole. However, NGET also noted that its model was an 'interim' solution and that it would seek to refine its constraint costs model so that an 'enduring' solution could be developed in a timely manner.

3.28. NGET considered that its proposed approach would allow it to derive the cost of constraints by comparing an unconstrained model (where the generation schedule is based on plants' marginal cost and there are no transmission limits) with a constrained model (where generation has to be reallocated because the ability to transport electricity around the network is subject to transmission limits and planned maintenance outages).[27]

3.29. NGET outlined that its model had been tested and calibrated against actual data for 2009–10 to ensure that its representation of plant characteristics and fundamentals was suitable for modelling activities taking place in future years. It also noted that the transmission limits that are expected during the incentive period have been applied to a zonal representation of the GB system.[28]

3.30. NGET sought views from industry about the treatment of planned generation and transmission outages. NGET noted that using a single snapshot (ex ante) of outages at the start of a two year scheme had the advantage of providing NGET with an incentive to schedule generation and transmission works in a cost minimising way. However, since maintenance schedules are subject to change by generators and transmission operators, using a single snapshot at the start of a two year scheme may lead to windfall profits and losses. NGET also suggested a 'rolling ex ante' approach where the transmission plan is input ex ante but it is updated on an annual basis to reduce its exposure to maintenance schedules 13–24 months ahead.

3.31. Unfortunately, NGET identified that its procured model was not capable of estimating headroom costs – the costs associated with replacing margin that is behind constraint boundaries.[29] NGET therefore developed another model to address

[27] In the unconstrained model, plants compete on the basis of short run marginal cost.
[28] A zonal representation of GB network means that the GB network is split into zones that are separated from each other by boundaries, each of which has a limited transmission capacity. Importantly, NGET noted that given more time it would be able to refine its representation of the GB network by modelling it on a nodal basis.
[29] Margin cannot be used if it has to be transmitted along a congested transmission line.

this shortcoming.[30] It noted, however, that given more time it would be able to address the need for this bespoke model by refining the model that it had procured.

3.32. NGET outlined options for determining the cost of constraints through the BM – that is the price that NGET has to pay for reallocating generation from the schedule predicted by the unconstrained model. Options included:

- modelling BM prices ex ante – this would incentivise NGET to improve on the modelled relationship but could lead to windfall gains/losses depending on the strength of the modelled relationship; and
- modelling BM prices ex post – this would reduce windfall gains/losses but, since NGET would not be exposed to price changes it would have less incentive to explore alternative constraint management options.

3.33. NGET noted that it had attempted to model BM prices ex ante but had been unable to determine a robust relationship. It investigated a number of different relationships to try and determine a viable relationship, including examining bids/offers made by all GB generators, generators at specific locations and generators that adopted different technologies. Despite this effort, NGET was unable to identify a robust relationship.

3.34. Given the difficulty in determining a robust relationship NGET proposed the use of ex post BM prices as an input into the models. However, it considered that the use of a discount factor would be appropriate to take account of the fact that the actual cost of managing constraints (a mixture of contracts and BM actions) is likely to be lower than the modelled cost, as that is based only on undertaking BM actions.

3.35. While NGET did not suggest a specific value for a discount factor in the IP, it subsequently proposed a discount factor (excluding headroom costs) of 30%. This figure was proposed on the basis of two factors – that resolving a constraint through contracting delivers a cost saving relative to undertaking BM actions and that historically some of NGET's constraint costs (excluding replacement of sterilised headroom) have been resolved through contracts. Following discussions with NGET this discount factor was subsequently increased to 41%.

3.36. Importantly, as part of the analysis that was undertaken to determine the appropriate discount factor NGET outlined that it could not influence the BM through the contracts that it entered into. It noted that these contracts consisted of both volume and price contracts, with the vast majority of them being volume contracts. It also noted that while there was often a BM pricing requirements stated in some of

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Therefore, NGET must pay to reallocate both generation and margin that is located on the wrong side of a constraint boundary.

[30] The inputs for this model are explained in Appendix 3.

its volume contracts these were of limited importance to it when determining whether or not to use a particular contract.

3.37. The final value of the constraint cost target will be calculated at the end of the scheme period, once the values of all ex post inputs are known. NGET will be incentivised against this final target. The latest estimate of constraint costs is given in Appendix 6, though it is important to note that these values do not constitute the final constraint cost target against which NGET will be incentivised.

Respondent's views – constraint cost modelling

3.38. All the respondents agreed that taking a single snapshot of generation outages, generation faults and transmission plans may lead to windfall gains/losses for NGET and that a rolling ex ante approach may be better suited. Some respondents also noted that the operation of these rolling ex ante inputs need to be clearly explained; otherwise it could be considered as another ex post adjuster.

3.39. With respect to the approach to costing constraints, some respondents noted the difficulty of modelling BM prices using a fundamentals approach and suggested the use of ex post BM prices with a discount factor. Respondents agreed with the principle that NGET should be incentivised for resolving constraints outside the BM, pointing out the potential for achieving this through constraint management innovations such as improved wind forecasting. Respondents also noted the constraints implications of interactions between the roles of SO and TO in scheduling of outages and network reinforcement.

3.40. Respondents did not disagree with NGET's IP about the calibration and modelling of boundary limits. They also stressed the importance of NGET's suggestion that the IP's 'interim' models be replaced in future schemes with 'enduring' models that would include more detailed representation of the transmission network. With respect to the modelling of wind, one respondent called for this to be improved given the expected increase in wind generation. Respondents also called for greater transparency, as well as more time to provide a meaningful response to the consultation.

Ofgem's views – constraint cost modelling

3.41. We welcome NGET's proposed approach to constraints – it has replaced its suite of bespoke constraints models with a GB-wide model that is capable of calculating the constrained and unconstrained merit order on an internally consistent basis, based on the principles of competitive market behaviour. We also recognise the significant effort that NGET has exerted in seeking to ensure that its model appropriately reflects conditions in the GB electricity market.

3.42. We consider that NGET's proposed approach to constraints is reasonable for this scheme – it will provide an incentivised target for constraint costs that minimises the scope for windfall gains and losses. The use of ex post inputs will, in general,

also reduce the scope for windfall gains and losses and will continue to incentivise NGET to reduce the cost of constraint management in the areas that it can control. The proposed treatment of each variable can be found in Appendix 4.

3.43. The proposed scheme will incentivise NGET to try to incur costs that are lower than the costs determined by its proposed constraints model. Taking the value of ex post inputs into account, the model calculates the cost of managing constraints in the BM. NGET therefore has an incentive to reduce constraints costs by reducing constraints volumes. For example, it may be able to reduce its constraints costs through smarter maintenance scheduling, procurement of intertrip services or trading with other SOs.

3.44. We consider that NGET's proposed approach to constraints is in principle suitable for incentivising economical constraint management action. However, we note that NGET is in the process of verifying the accuracy of the proposed model's calculations. We are consulting on the basis that this process does not result in material changes to the overall scheme.

3.45. We consider that BM prices should be ideally treated on an ex ante basis. However, given the current inability to determine an appropriate method to forecast BM prices, we consider that modelling BM prices ex post is acceptable at this time since this will reduce the scope for windfall gains/losses.

3.46. We also consider that the scope for NGET to enter into price and volume contracts that have conditions on the BM prices that a generator can submit is problematic. As NGET can influence pricing in the BM via its pricing contracts the inclusion of such could result in NGET gaming the incentive for its benefit. We therefore consider that a temporary restriction on this distortion is warranted.

3.47. While we are not generally disposed to imposing a temporary restriction on such behaviour, we consider that the scope for gaming and NGET's indication that it rarely uses such contracts means that this can occur with very limited impact on NGET's day to day commercial activity. Importantly, NGET accepts our concerns and has indicated that action to limit this activity, until this issue can be resolved, is appropriate.

3.48. We are therefore proposing to amend NGET's licence (and NGET has signalled its consent) with a condition that limits, for the duration of the scheme, its ability to enter into any contract that places conditions on the prices at which a generator (or other market participant) will submit offers or bids in the BM in respect of any BM unit.

3.49. NGET's proposed model also assumes all constraints will be resolved through BM actions, while in practice it resolves some of its constraints more economically through other mechanisms – contracts and intertrips. We therefore consider that the use of a discount factor, which incentives NGET to reduce constraints costs by reducing constraint volumes and resolving constraints through other mechanisms that are more efficient, is an essential part of the scheme.

3.50. Based on analysis undertaken by NGET, analysis undertaken by the independent consultant engaged to assist us and on our own analysis, we consider that a discount factor of 41% is appropriate. This is higher than the 30% initially proposed by NGET and the 38% proposed by the independent consultant engaged to assist us. We consider that a 41% discount factor is appropriate for this scheme as it ensures that NGET is rewarded only for performance that is better than it has achieved in the past.

3.51. We note the options raised by NGET regarding the treatment of outage plans in its models (see paragraph 3.29). Based on our own analysis, the material provided by NGET and the views of the independent consultant engaged to assist us, we consider that this is best managed in the following manner:

- Planned transmission outages for the incentive scheme period will be entered into the model prior to the start of the scheme. We consider that NGET has sufficient influence over transmission outage planning, in its capacity as GB SO and transmission owner for England & Wales, for a two year ex ante input to be appropriate.[31]
- Planned generation outages will be entered into the model as an ex ante input, but will be updated annually, to reflect the fact that generators' outage plans are subject to change and are beyond NGET's control.[32] This means that planned generation outage data will be updated at the end of scheme year one.
- Unplanned outages will be an ex ante input entered into the model as a stochastic simulation[33] based on normal historic breakdown rates. While we recognise that NGET is not in a position to control and forecast unplanned outages, we believe it is reasonable to incentivise NGET on the basis that a certain level of unplanned generation and transmission outages will occur in a given year.[34]

3.52. With regard to wind generation, we note that NGET's ability to forecast and manage increased levels of wind will become an increasingly important part of forecasting constraint costs going forward. As per paragraph 2.24 , we consider that NGET should seek to improve its expertise in this area and have therefore placed a new licence requirement on it to do this.

3.53. Importantly, we note that the constraint costs model that NGET has proposed is an 'interim' solution. We therefore welcome NGET's intention to further develop its constraints model over the coming months so that an 'enduring' solution is developed – a solution that will involve (amongst others) more detailed representation of the transmission system and will have the capacity to estimate the

[31] This data will be input using the Final Transmission Outage Programme agreed by NGET in engineering week 48 of the previous year.
[32] The Final Generation Outage Programme, agreed by NGET on 31 March 2012 will be used as input data.
[33] Stochastic simulation is a mechanism for dealing with uncertainty. In this case, it uses estimated breakdown rates for each power plant to predict unexpected outages.
[34] More information on these issues is available in Appendix 5.

cost of constrained headroom.[35] To ensure that this occurs we are proposing to place a special licence condition on NGET to undertake further refinements to its constraint costs modelling.

[35] It should also be able to model transmission losses.

4. Scheme design and governance arrangements

Chapter Summary

This chapter outlines NGET's proposed approach to scheme design and governance arrangements as part of NGET's overall incentive methodology for electricity external SO costs for 2011–13. It provides our views on NGET's proposed approach to scheme design and governance arrangements as part of NGET's overall incentive methodology for electricity external SO costs to apply from April 2011.

Question Box

Question 6: Do you consider that the final proposals' scheme design and governance arrangements for the SO incentive scheme to apply to NGET's external SO costs are reasonable?

Question 7: Do you consider that the proposed licence modifications appropriately reflect the final proposals as described in this chapter?

Background

4.1. The previous SO incentive scheme set a target for bundled energy and constraint costs. Under this approach NGET received no payment when outturn costs were within the deadband. However, when outturn costs were below (above) the deadband then NGET received (paid) 15% of the difference subject to a maximum of £15m.

4.2. In setting the previous scheme we acknowledged that there were areas of uncertainty over which NGET had no control, particularly with respect to constraint costs. We therefore included two automatic adjusters in the scheme, whereby the target would be adjusted downward in the event that wind volume output in Scotland and the volume of exports across the IFA were lower than anticipated.

4.3. In the Preliminary Conclusions we outlined that the SO incentive scheme should:

- be a bundled scheme in which NGET is incentivised to minimise the total of its external SO costs, across all cost categories;
- be suitable for application over a two year period; and
- provided our recommendations were adopted, reduce NGET's exposure to windfall gains and losses, thereby allowing for higher profit caps, loss floors and sharing factors and reducing the need for a deadband. We also noted the scheme parameters should be equal across the two years of the scheme.

4.4. We noted that control and governance were key uncertainties with our proposed approach. In particular, we were concerned with who would have ownership of the models, which inputs would be based on actual outturns, and how these would be considered within the modelling framework and the setting of the scheme.

NGET's proposal – scheme design

4.5. NGET agreed with the Preliminary Conclusions on scheme design and proposed:

- a bundled two year scheme – it noted that while unbundling of the scheme may allow more targeted incentives (given that SO activities can often affect several cost categories under the scheme) unbundling could affect its broader view of the impact of specific balancing actions;
- sharing factors of ±25%[36] – a level that it considered reflected the significant change to incentivisation being proposed and a level that facilitated alignment with the sharing factors being proposed under the RIIO–T1 work; and
- a profit cap/loss floor of ±£50m over the two years – a level it considered sufficient to place a strong incentive on it to innovate and deliver value but also a level that represented an appropriate balance between risk and reward.

4.6. In response to issues raised by respondents to the IP, NGET outlined that:

- its proposed approach to incentivisation should place greater focus on whether its actions are efficient and that it would make it more difficult for it to achieve a profit, although the increased duration of the scheme, coupled with a higher profit cap/loss floor, would encourage it to pursue higher risk/greater reward strategies with the ultimate aim of lowering costs to customers;
- there was an important distinction between removing the potential for windfall profit or loss and de-risking the actions taken by the SO; and
- its view on the appropriate level of the sharing factors to be applied would be determined following further discussions with Ofgem.

Respondents' views – scheme design

4.7. In general, respondents considered that moving to a longer term incentive scheme was premature, and that keeping the scheme to one year was appropriate.[37] Concerns regarding bundling were, however, limited. One respondent suggested consideration should be given to setting an incentive for each of the major elements that make up the SO incentive. Another respondent suggested targeted incentives

[36] Following the decision to use ex post BM prices in its constraints modelling, NGET revised its proposed sharing factor to ±35%.
[37] The concerns were based on a number of factors, however, we summarise these as being the robustness of NGET's modelling and concerns over the level of consultation on the IP.

could be established for projects that the current one year bundled scheme failed to encourage (due to its relatively short timeframe).

4.8. With respect to a deadband, respondents, in general, indicated that a reduced deadband to cover modelling errors/limitations of the ex ante relationships was reasonable.

4.9. There were mixed views on NGET's proposed sharing factors. Two respondents suggested NGET's proposed approach was, in general, reasonable. Two others considered that the sharing factors should be lower. In general, the remaining respondents highlighted the lack of justification for the proposed sharing factors.

4.10. There were also mixed views on NGET's proposed profit cap/loss floor. One respondent supported NGET's proposed profit cap/loss floor of ±£50m while another supported a profit cap/loss floor of ±£30m. The remaining respondents either questioned whether the caps should be lower due to modelling risk or highlighted the lack of justification for the level being proposed by NGET.

Ofgem's views – scheme design

4.11. We consider that it is appropriate to incentivise NGET against a single target covering all cost categories as several SO activities can affect, to some extent, several cost categories. A bundled scheme therefore provides NGET with perspective across all its SO activities to enable it to create additional benefits that can be passed on to consumers. Furthermore, a bundled scheme will encourage NGET to consider trade-offs between its activities. We do not therefore see any reason to move to a less bundled approach at this time.

4.12. We note the concern raised by a number of respondents that moving to a longer term incentive scheme was premature, and that keeping the scheme to one year was appropriate. We consider that the proposed methodology, including the models and inputs, has been subject to sufficient review, recognising that validation of the constraint cost model remains to be completed. We also consider that implementing a two year scheme will allow us to observe the effectiveness of the methodology in practice, including its suitability for future, multi year incentives.

4.13. We consider that moving to a longer term scheme will bring a number of benefits which will be to the ultimate benefit of consumers. Specifically, we consider that a bundled two year scheme will:

1. improve transparency, with a longer incentive period leading to increased information discovery on costs that will enable the scheme to become more targeted over time;
2. allow NGET to take a more strategic view of its operation of the electricity system over a longer period;
3. set stronger incentives on NGET with regard to its contracting strategy;

4. incentivise NGET to consider actions that have higher upfront costs, and which can be paid back over a longer period;
5. allow for greater alignment with other regulatory decisions, such as RIIO–T1; and
6. reduce administrative burden in the longer term, as the scheme would not be set on an annual basis.

4.14. With respect to the caps and floor, we consider there is merit in increasing these parameters as NGET has, in general, addressed the concerns we identified with its incentive methodology – its proposed approach is focused on the factors that it can control and also reduces the scope for windfall gains and losses. We consider that increasing these parameters will create a stronger incentive for NGET to innovate and deliver value in areas that it can control.

4.15. We note the concerns raised by a number of respondents regarding the lack of detail surrounding NGET's proposed caps and floors. As a result of these, and our own concerns, we sought further information from NGET on this issue. NGET responded by noting that its proposed cap and floor was appropriate due to (amongst other factors):

- increased transparency in the costs it incurs in undertaking balancing services;
- reduced volatility, and therefore reduced scope for windfall gains and losses, of the proposed scheme relative to more recent schemes; and
- the appropriate application of risk, and that any cap and floor set has to be considered as part of the overall level of incentivisation set.

4.16. Based on the subsequent material provided by NGET, and our own analysis, we consider that a profit cap/loss floor of ±£50m is appropriate for the two years. We consider that a cap and a floor of this level appropriately balance the risks associated with the new methodology, while maintaining a sufficiently robust incentive for NGET to improve its performance.

4.17. We consider that having a deadband to reflect modelling errors and the limitations of ex ante relationships is appropriate. Based on the information that we have considered and our analysis we consider that a deadband of £10m is reasonable.

4.18. With respect to the sharing factors, we consider that there is merit in strengthening the incentive faced by NGET. In particular, we consider that stronger sharing factors will ensure that NGET places greater focus on whether its actions are efficient. We also consider that there is an important distinction to be made between removing the potential for windfall profit or loss under the scheme and de-risking the actions taken by the SO.

4.19. We note the concerns raised by a number of respondents regarding the lack of detail provided to justify the level of NGET's proposed sharing factors. As a result of these, and our own concerns, we sought further information from NGET on this issue. In addition to the reasons outlined in paragraph 4.14, NGET noted that its

proposed sharing factors were appropriate as they represented an appropriate 'stepping stone' until the RIIO–T1 review process had been completed.

4.20. Based on the subsequent material provided by NGET, and our own analysis, we consider that symmetrical sharing factors of ±25% are appropriate. We consider that sharing factors of this magnitude are appropriate as they:

- appropriately balance the risks associated with the new methodology, while maintaining a sufficiently robust incentive for NGET to improve; and
- facilitate greater alignment with the sharing factors that have been identified in the RIIO-TI documents.

NGET's proposal – governance arrangements

4.21. NGET proposed a number of governance arrangements to increase the effectiveness and transparency of a multi year incentive scheme. Specifically, it proposed:

- governance arrangements that would need to be agreed prior to implementation of the proposed scheme;
- governance arrangements that would be required during the scheme (within scheme adjustments); and
- criteria by which variables would be treated in its proposed models.

4.22. With respect to agreements required prior to the implementation of the proposed scheme, NGET proposed that it would need to agree with us the models that would be used, the treatment of model inputs (as either ex post or ex ante) and the formulation of ex ante and ex post datasets. NGET noted that the criteria used to assess what drivers should be modelled ex ante or ex post should be public and subject to a formal governance process.

4.23. NGET considered that for cost drivers identified as being suitable for:

- ex ante treatment, that the basis of the relevant datasets would need to be agreed ('fixed') between it and Ofgem prior to the implementation of the scheme; and
- ex post treatment, that data sources and appropriate timescales and resolutions would need to be determined in a transparent and non-subjective manner – its proposed approach to determining the suitability of a cost driver to be ex post is detailed in chapter 2.

4.24. NGET proposed that a methodology statement (subsequently revised to three methodology statements), pursuant to its transmission licence, was the appropriate tool to use to manage governance arrangements. It considered this would facilitate transparency and allow the detail to be reviewed and updated using an established mechanism. It also proposed that the methodology statement lapse at the end of the scheme.

4.25. However, NGET considered that specific model parameters and the actual data it used should not be made public. It considered that this level of transparency would allow interested parties to determine its incentivised target costs and potentially influence its performance. It noted that these issues should be agreed through a bilateral agreement with Ofgem and referenced in its licence condition.

4.26. NGET proposed that the SO incentive licence condition should reference the model parameters and input data to be used in the scheme and contain the parameters describing the incentive scheme profile.

4.27. With respect to within scheme adjustments, NGET considered that there were circumstances where it would be appropriate to permit within scheme adjustments. While it initially considered within scheme adjustments should be managed via a 'scheme adjusting event', it later revised its approach and proposed that the current Income Adjusting Events (IAE) provisions were sufficient. NGET also highlighted a number of events (known unknowns) that were expected to occur during the scheme and which it considered difficult to model/quantify. NGET sought respondents' views on how to manage these events.

Respondents' views – governance arrangements

4.28. With respect to the agreements required prior to the implementation of the proposed scheme, three respondents agreed that the creation of an open, transparent statement describing NGET's methodology for determining whether model inputs should be treated on an ex ante or ex post basis had merit. One of these respondents also noted that there would be a need for appropriate regulatory governance for any changes to the methodology.

4.29. In general, respondents also considered that there was a lack of transparency with the proposed values of the ex post and ex ante variables, and the proposed models. Respondents considered that greater transparency would have merit.

4.30. With respect to within scheme adjustments, respondents generally considered that providing for limited scheme adjusting events was reasonable.[38] With respect to managing the 'known unknowns', two respondents responded to NGET's questions. Both respondents considered that NGET should be able to make a reasonable forecast of the impact of the known unknowns, with one of them also considering that a deadband should allow for reasonable variation in these elements.

[38] One respondent considered NGET's approach reasonable, another noted that two of the three known unknowns were reasonable and that it was unlikely that there would be a material shift in policy or regulation that could not have been reflected at the commencement of the scheme, another only agreed with the need to be able to adjust for material mistakes, and one noted moves to reduce exposure to these events would be welcome but did not provide any specific views on how to achieve this.

Ofgem's views – governance arrangements

4.31. With respect to agreements required prior to the implementation of the proposed scheme, we consider that NGET's proposed approach to releasing its methodologies and models is appropriate. While we note respondents' concerns regarding transparency, we consider that NGET's approach strikes the appropriate balance as to what can be released without undermining NGET's responsibility as SO.

4.32. With respect to the level of consultation provided, we accept the time for greater consultation could have been longer. However, we also note that NGET undertook a number of presentations on its proposed approach and also volunteered to provide interested parties one-on-one discussion on any aspect of its proposals.

4.33. Returning to the agreements required prior to the implementation of the proposed scheme, we therefore consider that:

- having three methodologies statements, pursuant to NGET's transmission licence, is an appropriate tool to manage governance arrangements and that these statements should lapse at the end of the scheme;
- the specific model parameters and the actual data used by NGET should not be made public and that these should be agreed with Ofgem and referenced in NGET's licence; and
- NGET's licence should refer to the model parameters and input data to be used within the scheme and that it should also contain the parameters describing the incentive scheme profile.

4.34. We recognise that the proposed approach to incentivisation is new and therefore unfamiliar but consider that this incentive methodology has been subject to a rigorous assessment process – by Ofgem, with the assistance of independent consultants (see Appendix 3 & 5). While we have considered respondents' views we consider that the proposed methodology is fit for purpose.

4.35. However, we also recognise that there is scope for further refinement to this incentive methodology. We therefore propose to place a new licence condition on NGET to further refine its methodology prior to the implementation of the next multi year SO incentive scheme. As part of this, we shall seek to ensure that appropriate consultation occurs as part of any consultation process that NGET undertakes.

4.36. With respect to within scheme adjustments, we consider that maintaining the current IAE approach is reasonable. We consider that this strikes the right balance between allowing the scheme to be reopened for factors outside NGET's control while providing regulatory certainty.

4.37. We would normally only expect NGET to raise an IAE in the event that there are unexpected and fundamental changes in wholesale energy markets. In the event that this occurred the Authority would then consider any IAE in accordance with the process set out in NGET's transmission licence.

4.38. As to managing 'known unknowns', we agree with the views expressed by respondents. We consider that NGET's modelling should be sufficiently robust to consider the impact of these issues and that a deadband will also allow for reasonable variation in these elements. We do not consider that any further amendments need to be made to allow NGET to manage 'known unknowns'.

5. Transmission losses and black start services

Chapter Summary:

This chapter outlines NGET's proposed approach to transmission losses and black start services as part of NGET's overall incentive methodology for electricity external SO costs for 2011–13. It provides our views on NGET's proposed approach to transmission losses and black start services as part of NGET's overall incentive methodology for electricity external SO costs to apply from April 2011.

Question box

Question 8: Do you consider that the final proposals' approach to transmission losses and black start services for the SO incentive scheme to apply to NGET's external SO costs are reasonable?

Question 9: Do you consider that the proposed licence modifications appropriately reflect the final proposals as described in this chapter?

Background

5.1. Black start services relate to the costs NGET incurs to procure services in order to restore the system after a partial or full shutdown of the transmission system. Transmission losses refer to the energy that is lost to the electricity transmission system due to the physical processes, such as resistive heating of transmission lines and magnetic and resistive losses in transformers.

5.2. The Preliminary Conclusions noted that transmission losses and black start should continue to part of the SO incentive scheme. While both these issues were not explored in detail in the Preliminary Conclusions, the concerns detailed within that document, particularly how to take into account uncertainty and increase transparency, are equally applicable to these issues.

NGET's proposed approach – transmission losses

5.3. In the IP NGET forecast that transmission losses for 2011–13 would be in the range of 11.8TWh (5.9TWh each year with a ±0.2TWh deadband). It noted that its forecast reflected the increased generation in the south of England since 2009–10

and the current France/GB price spreads. NGET provided no views on an appropriate reference price at this point.[39]

5.4. Subsequent to it publishing its IP, NGET revised down its proposed transmission losses for 2011–13 to 11.0TWh[40] (5.5TWh each year) with a deadband of ±0.5TWh. Following further discussions with Ofgem this was amended to 8.9TWh (4.6TWh and 4.3TWh for each year respectively) with a deadband of ±0.6TWh. This change in position was due to NGET's recognition of the relatively stronger than expected impact of new southern generation and slower than expected renewable connection in Scotland.

5.5. As part of discussions that we had with NGET it also proposed that the transmission losses reference price for 2011–13 be an ex post input. NGET considered this was appropriate as it would reduce the scope for windfall gains and losses, and that it was consistent with how it had proposed power prices be considered in its other models.

5.6. NGET considered that the using the average wholesale price of electricity (SPNIRP) for the whole period could be used to determine the cost of losses for the scheme.

Respondents' views – transmission losses

5.7. No specific comments were provided by respondents on this issue.

Ofgem's views – transmission losses

5.8. We consider that transmission losses of 8.9TWh ±0.6TWh for the proposed scheme over 2011–13 is an appropriate target. We consider this level of expected transmission losses is reasonable given the expected increase in southern generation, which will offset the expected wind growth in Scotland.

5.9. We also consider that the use of ex post prices is appropriate. This approach is consistent with other aspects of the methodology and will remove the scope for NGET to experience windfall gains and losses associated with changes in prices. This approach will continue to place an incentive on NGET to manage the volume of losses that it incurs.

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[39] Under the scheme, the reference price is multiplied by the difference between the actual and target volume of losses to calculate a total financial value of transmission losses. Previously the reference price has been based on the forward price at the time the incentive was set plus an adjustment to replicate the shadow price of carbon.

[40] This position was articulated by NGET on 15 February 2011, at its Balancing Services Use of System charges seminar in Claverdon.

5.10. In addition, we consider that using SPNIRP for the whole period is appropriate for this particular scheme. We note that NGET has access to and the capacity to collect information on transmission losses and SPNIRP on a half hourly basis – indeed the use of half hourly SPNIRP has been proposed by NGET in a number of different models. As such, we consider that going forward, the use of half hourly prices is an area where NGET should look to assess if it can determine a more accurate estimate of the cost of transmission losses that it incurs in undertaking its role as SO.

5.11. We note that NGET considers that it will be able to implement a more robust mechanism to forecast transmission losses following further development of its constraints modelling tool. We look forward to seeing this development prior to the commencement of the next multi year electricity SO incentive scheme. To this effect, we are proposing to implement a special licence condition on NGET to progress this issue in a timely manner.

NGET's proposed approach – black start services

5.12. In its IP NGET noted that the cost elements associated with providing black start services would continue to be forecast ex ante. However, no cost details were provided within the IP.

5.13. Subsequent to releasing the IP, NGET provided information to Ofgem on its black start services forecasts costs for the scheme. Following these discussions NGET proposed a forecast of £40m for black start services for the duration of the scheme. However, NGET also noted that it is facing a number of challenges in relation to procurement of black start services – specifically it noted that the expected retirement and/or costs of current providers of this service was resulting in challenges. NGET therefore proposed that a mechanism be developed to take into account the costs of procuring black start services from new black start service providers.

Respondents' views – black start services

5.14. No specific comments were provided by respondents on this topic.

Ofgem's views – black start services

5.15. We consider that the black start service costs that NGET has proposed are reasonable although note that we were required to ask numerous questions of NGET before we were reasonably satisfied that it could justify its proposals. We now consider that NGET has demonstrated that its forecasts are reasonably reflective of the costs that an operator in its particular circumstances would reasonably incur in undertaking its role as SO.

5.16. Based on the information provided by NGET and our own analysis we therefore agree with NGET's proposal and propose that target costs of £40m over the

duration of the scheme for black start services are reasonable. However, we also consider that it is appropriate to provide NGET access to a limited amount of additional funds for procuring black start services from generators not currently providing this service.

5.17. We consider there is merit in providing NGET access to a limited amount of additional funds for procuring black start services from generators not currently providing this service as it is facing challenges in this area, particularly with respect to undertaking feasibility studies and testing at current and new generators. However, given the difficulty of estimating the potential costs associated with this aspect of NGET's operation, we do not consider it appropriate at this time to allow NGET an allowance for these costs in its target. We do, however, consider that it is appropriate to place a special licence condition on NGET to develop an appropriate mechanism by which the provision of black start services is procured from other generators. We are therefore proposing to place a special licence condition on NGET setting that out.

5.18. We note that the limited information provided on black start services in the IP may have limited the scope for stakeholders to respond to NGET's proposals. However, we consider that this document should provide some information on this issue and we encourage stakeholders to respond to the information contained within. We also note that we will continue to work with NGET to facilitate the release of robust and timely information to maximise the scope for stakeholders to respond to issues.

6. Summary of final proposals

Chapter Summary

This chapter summarises our final proposals for NGET's electricity external SO costs for 2011–13. It provides our views on how we propose to take things forward.

Question box

Question 10: Do you consider that the final proposals for the SO incentive scheme to apply to NGET's external SO costs represent a fair balance of risk and reward?

Question 11: Do you consider that the proposed licence modifications appropriately reflect the final proposals as described in this chapter?

Final Proposals – summing up

Methodology

6.1. As set out in earlier chapters, we consider that the incentive methodology, including the models and inputs, outlined in this document is suitable for application to a multi year incentive scheme. This methodology takes into account the impact of unpredictable and uncontrollable external factors affecting NGET's cost base by adjusting the incentive target at the end of the scheme period for these factors, thereby reducing the scope for windfall gains and losses. A key aspect of this methodology is the criteria for deciding whether a variable should be ex post or ex ante. We consider this methodology represents a significant improvement on previous arrangements. It will maintain a strong incentive on NGET to undertake its role as SO, in both the short and long term in an efficient manner.

6.2. We also propose the use of a GB-wide fundamental model in which a fully functioning dispatch model is used to schedule plant according to marginal costs. This model will produce a cost estimate based on resolving constraints in the BM. Since we expect NGET to resolve some constraints at a lower cost (through contracting and intertrips), the final target will be set by applying a discount factor to the cost estimated by the model. We currently consider that a discount factor of 41% is appropriate.

6.3. Notwithstanding the expected improvements in the scheme that this new methodology will bring, we consider that there remains some uncertainty regarding costs. We are therefore proposing the inclusion of a deadband in this scheme.

6.4. As with previous schemes, we have included a mechanism (an Income Adjusting Event) by which the incentive methodology can be amended as a result of some specific (material) events occurring – we consider that this approach balances the need for regulatory certainty while providing scope to adjust the methodology to reflect factors outside of NGET's control.

Governance arrangements

6.5. As set out in earlier chapters, we propose that the governance arrangements prior to scheme commencement and for the duration of the incentive scheme are appropriate. We consider that the information contained in the licence modification as well as NGET's methodology statements, which are linked to NGET's licence, strike the appropriate balance between the commercially sensitive nature of some data and the need to provide information to interested parties.

Scheme design

6.6. As set out in earlier chapters, we consider it appropriate to continue to have a bundled scheme and that it be two years in duration – to achieve this we are proposing that the scheme be retrospectively applied from April 2011.

Deadband

6.7. As set out in earlier chapters we consider it appropriate to have a £10m deadband across two years.

Sharing factors

6.8. We have looked at the options put forward by NGET regarding sharing factors and have also consider that it is important to ensure that NGET remains incentivised over a wide range of costs. Taking into account NGET's proposed methodology, respondents' views and our own analysis, we consider that symmetrical sharing factors equivalent to ±25% should be implemented.

Cap/floor

6.9. As set out in earlier chapters we consider it appropriate to have a cap/floor at ±£50m across two years.

Transmission losses

6.10. We propose that the target volume for transmission losses should be 8.9TWh with a deadband between 8.3 – 9.5TWh for the 2011–13 scheme. We also propose that the transmission losses reference price be based on average actual SPNIRP for the whole period.

Black start

6.11. We propose that the black start services costs included in the target for the 2011–13 scheme should be £40m. However, we are also proposing to place a special licence condition on NGET that will require it to develop a mechanism by which it can

procure black start services from generators not currently providing this service – a limited amount of additional funds is associated with this special licence condition.

Proposed way forward longer term

6.12. As discussed earlier in this document, we consider that the implementation of multi year incentive schemes will have a number of benefits, not least that it will allow for greater alignment with other regulatory decisions. We consider that there are advantages from aligning the incentives on SOs with the incentives on the TOs in recognition of the interactions between these roles. This issue is being considered as part of the RIIO–T1 consultation process and will also be explored in another consultation document that we will be publishing shortly. This document will set out our initial views with respect to the incentivisation of NGET as SO from 1 April 2013.

6.13. We consider that if NGET accepts our final proposals we shall continue to aim to implement a multi year incentive scheme longer than two year scheme from April 2013. In doing this, we recognise that there are a number of hurdles that will need to be overcome before any extension to the scheme's duration can be made. However, we consider that it appropriate to start this process now rather than later. As such, NGET will be obliged to work with us to further improve its proposed SO methodology so that the incentives faced by NGET minimise the overall costs to consumers. We are therefore proposing to include a new condition in NGET's licence setting this out.

6.14. We are also proposing, as noted earlier in this document, that there are aspects of the incentive methodology outlined in the final proposals where further refinement could be possible. We are therefore proposing that NGET improve its incentive methodology by undertaking action to improve:

- its ability to forecast wind and BM prices;
- modelling of the network, specially progress towards nodal modelling;
- modelling transmission losses and modelling sterilised headroom; and
- how it will procure black start services going forward.

We are proposing new conditions in NGET's licence setting this out.

6.15. We consider that this approach will facilitate improvements in the SO incentive regime and that the improved incentives that NGET will be exposed to will help minimise the overall costs to consumers.

Appendices

Index

Appendix 1 – Consultation response and questions

1.1. Ofgem would like to hear the views of interested parties in relation to any of the issues set out in this document. We would especially welcome responses to the specific questions which we have set out at the beginning of each chapter heading and which are replicated below.

1.2. Responses should be received by 8 July 2011 and should be sent to gb.markets@ofgem.gov.uk for the attention of:

- Ian Marlee
- Partner, GB Markets
- Ofgem
- 9 Millbank
- London
- SW1P 3GE

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. Any questions on this document should, in the first instance, be directed to Giuseppina Squicciarini, Head of Regulatory Economics, GB markets (Ph: 020 7901 7366, email: giuseppina.squicciarini@ofgem.gov.uk) or Ian McNicol, Senior Economist, (Ph 020 7901 1718, email: ian.mcnicol@ofgem.gov.uk).

CHAPTER 1 – Background

Question1: There are no specific questions in this chapter.

CHAPTER 2 – Incentive methodology

Question 2: Do you consider that the final proposals' proposed incentive methodology for the SO incentive scheme is reasonable?

Question 3: Do you consider that the proposed licence modifications appropriately reflect the final proposals as described in this chapter?

CHAPTER 3 – Modelling: energy and constraint costs

Question 4: Do you consider that the approach to modelling energy and constraints costs as detailed in the final proposals are reasonable?

Question 5: Do you consider that the proposed licence modifications appropriately reflect the final proposals as described in this chapter?

CHAPTER 4 – Scheme design and governance

Question 6: Do you consider that the final proposals' proposed scheme design and governance arrangements for the SO incentive scheme to apply to NGET's external SO costs are reasonable?

Question 7: Do you consider that the proposed licence modifications appropriately reflect the final proposals as described in this chapter?

CHAPTER 5 – Transmission losses and black start

Question 8: Do you consider that the final proposals' approach to transmission losses and black start for the SO incentive scheme to apply to NGET's external SO costs are reasonable?

Question 9: Do you consider that the proposed licence modifications appropriately reflect the final proposals as described in this chapter?

CHAPTER 7 – Summing up

Question 10: Do you consider that the final proposals for the SO incentive scheme to apply to NGET's external SO costs represent a fair balance of risk and reward?

Question 11: Do you consider that the proposed licence modifications appropriately reflect the final proposals as described in this chapter?

Appendix 2 – Notice under Section 11 of the Electricity Act 1989

1.1. Please see separate document containing the notice.

Appendix 3 – Frontier economics report on energy modelling

1.1. Please see separate document containing the report *Moving towards a longer term SO incentive regime – review of NGET's Phase 2 proposals for the energy model* by Frontier Economics.

Appendix 4 – Proposed treatment of inputs

1.1. The table below represents the proposed treatment of inputs into the proposed methodology that forms part of the final proposals.

Model	***Variable***	***Ex ante/ Ex post***
Energy Imbalance	SPNIRP	Ex Post
	NIV	Ex Post
Margin	Headroom Volume	Ex Post
	NIV	Ex Post
	STOR Volume	Ex Ante
	Frequency Response Volume	Ex Ante
	Wind Volume	Ex Post
	Scottish Export Constraint Volume	Ex Ante (volume predicted by the constraints model to be used as input to margin model)
	SPNIRP	Ex Post
	Unsync MEL (sum of unsynchronised maximum export limits)	Ex Post
Frequency Response	NIV	Ex Post
	Headroom Volume	Ex Post
	SPNIRP	Ex Post
	Nuclear Generation	Ex Post
	Demand	Ex Ante
	Wind Generation	Ex Post
Fast Reserve	Historic Fast Reserve Bid Volume	Ex Ante
	Historic Fast Reserve Offer Price	Ex Ante
	SPNIRP	Ex Post
	Wind Generation	Ex Post
Footroom	Demand	Ex Ante
	Nuclear Generation	Ex Post
	Wind Generation	Ex Post
	Historic Footroom Prices	Ex Ante
Reactive Power	SPNIRP	Ex Post
	RPI	Ex Post
	Demand	Ex Ante

Model	***Variable***	***Ex ante/ Ex post***
Constraints	Demand	Ex Ante
	Wheeling Charges (charge for use of Interconnectors)	Ex Ante
	Interconnection Market Stacks (Characterisation of markets connected to GB)	Ex Ante
	Planned Outages (OC2 data) [Transmission outages input as two-year plan. Generation outages refreshed at the end of the first year.]	Ex Ante
	Unplanned Outages	Ex Ante (stochastic)
	Plant Efficiencies	Ex Ante
	Generator Start-up Costs	Ex Ante
	Plant Dynamic Parameters	Ex Ante
	LCPD Annual Capacity Factor Limit	Ex Ante
	Hydro Generation Modelling Assumptions	Ex Ante
	SPNIRP	Ex Post
	Wind Generation	Ex Post
	Fuel Prices	Ex Post
	Carbon Prices	Ex Post
	Electricity prices in the Balancing Mechanism	Ex Post

Appendix 5 – Frontier economics report on constraint modelling

1.2. Please see separate document containing the report *Moving towards a longer term SO incentive regime – review of NGET's Phase 2 proposals for the constraint model* by Frontier Economics.

Appendix 6 – NGET's latest view of 2011–13 BSUoS charges

1.1. On 31 May 2011, NGET produced its latest BSUoS costs for 2011–13 based on hypothetical ex post costs:

- for energy costs, these costs were £508m in 2011–12 and £505m in 2012–13; and
- for constraint costs, these costs were £212m in 2011–12 and £158m in 2012–13.

Importantly, these costs included £40m for Black Start spread evenly across the two years period.

Appendix 7 – The Authority's Powers and Duties

1.1. This description summarises the primary powers and duties of the Authority. It is not comprehensive and is not a substitute to reference to the relevant legal instruments (including, but not limited to, those referred to below)

1.2. The Authority's powers and duties are largely provided for in statute (such as the Gas Act 1986, the Electricity Act 1989, the Utilities Act 2000, the Competition Act 1998, the Enterprise Act 2002 and the Energy Acts of 2004, 2008 and 2010) as well as arising from directly effective European Community legislation.

1.3. References to the Gas Act and the Electricity Act in this appendix are to Part 1 of those Acts.[41] Duties and functions relating to gas are set out in the Gas Act and those relating to electricity are set out in the Electricity Act. This description must be read accordingly.[42]

1.4. The Authority's principal objective is to protect the interests of existing and future consumers in relation to gas conveyed through pipes and electricity conveyed by distribution or transmission systems. The interests of such consumers are their interests taken as a whole, including their interests in the reduction of greenhouse gases and in the security of the supply of gas and electricity to them.

1.5. The Authority is generally required to carry out its functions in the manner it considers is best calculated to further the principal objective, wherever appropriate by promoting effective competition between persons engaged in, or commercial activities connected with,

- the shipping, transportation or supply of gas conveyed through pipes
- the generation, transmission, distribution or supply of electricity
- the provision or use of electricity interconnectors

1.6. Before deciding to carry out its functions in a particular manner with a view to promoting competition, the Authority will have to consider the extent to which the interests of consumers would be protected by that manner of carrying out those functions and whether there is any other manner (whether or not it would promote

[41] Entitled "Gas Supply" and "Electricity Supply" respectively.
[42] However, in exercising a function under the Electricity Act the Authority may have regard to the interests of consumers in relation to gas conveyed through pipes and vice versa in the case of it exercising a function under the Gas Act.

competition) in which the Authority could carry out those functions which would better protect those interests.

1.7. In performing these duties, the Authority must have regard to:

- the need to secure that, so far as it is economical to meet them, all reasonable demands in Great Britain for gas conveyed through pipes are met;
- the need to secure that all reasonable demands for electricity are met;
- the need to secure that licence holders are able to finance the activities which are the subject of obligations on them[43]; and
- the need to contribute to the achievement of sustainable development.

1.8. In performing these duties, the Authority must have regard to the interests of individuals who are disabled or chronically sick, of pensionable age, with low incomes, or residing in rural areas.[44]

1.9. Subject to the above, the Authority is required to carry out the functions referred to in the manner which it considers is best calculated to:

- promote efficiency and economy on the part of those licensed[45] under the relevant Act and the efficient use of gas conveyed through pipes and electricity conveyed by distribution systems or transmission systems;
- protect the public from dangers arising from the conveyance of gas through pipes or the use of gas conveyed through pipes and from the generation, transmission, distribution or supply of electricity; and
- secure a diverse and viable long-term energy supply, and shall, in carrying out those functions, have regard to the effect on the environment.

1.10. In carrying out these functions the Authority must also have regard to:

- the principles under which regulatory activities should be transparent, accountable, proportionate, consistent and targeted only at cases in which action is needed and any other principles that appear to it to represent the best regulatory practice; and

[43] Under the Gas Act and the Utilities Act, in the case of Gas Act functions, or the Electricity Act, the Utilities Act and certain parts of the Energy Acts in the case of Electricity Act functions.
[44] The Authority may have regard to other descriptions of consumers.
[45] Or persons authorised by exemptions to carry on any activity.

- certain statutory guidance on social and environmental matters issued by the Secretary of State.

1.11. The Authority may, in carrying out a function under the Gas Act and the Electricity Act, have regard to any interests of consumers in relation to communications services and electronic communications apparatus or to water or sewerage services (within the meaning of the Water Industry Act 1991), which are affected by the carrying out of that function.

1.12. The Authority has powers under the Competition Act to investigate suspected anti-competitive activity and take action for breaches of the prohibitions in the legislation in respect of the gas and electricity sectors in Great Britain and is a designated National Competition Authority under the EC Modernisation Regulation[46] and therefore part of the European Competition Network. The Authority also has concurrent powers with the Office of Fair Trading in respect of market investigation references to the Competition Commission.

[46] Council Regulation (EC) 1/2003.

Appendix 8 – Glossary

B

Balancing and Settlement Code (BSC)

Sets out the rules for governing the operation of the Balancing Mechanism and the Imbalance Settlement process and also sets out the relationships and responsibilities of all electricity market participants.

Balancing Mechanism (BM)

The mechanism by which the electricity System Operator procures commercial services (Balancing Services) from generators and suppliers post gate closure, in accordance with the relevant provisions of the Balancing and Settlement Code (BSC) and the Grid Code.

Balancing Services

The services that the electricity System Operator needs to procure in order to balance the transmission system.

Balancing Services Incentive Scheme (BSIS)

The incentive scheme under which NGET is encouraged to reduce the level of external Balancing Service costs below a target level.

Balancing Services Use of System charges (BSUoS)

The daily charge, levied by the System Operator on users of the transmission system, in order to recover the costs of operating the transmission system and procuring and utilising Balancing Services.

Black Start

The ability to start a generating plant without external power supplies.

C

Constrained Margin Management (CMM)

CMM refers to single actions taken by NGET which have the combined effect of replacing sterilised operating margin (situated behind a constraint boundary) and increasing the available quantity of positive operating reserve.

Constraints (also known as congestion)

A constraint occurs when the capacity of transmission assets is exceeded so that not all of the required generation can be transmitted to other parts of the network, or an area of demand cannot be supplied with all of the required generation.

Connection and Use of System Code (CUSC)

Constitutes the contractual framework for connection to, and use of, National Grid's high voltage transmission system.

E

Ex Ante / Ex Post Inputs

Ex ante inputs to NGET's models are those whose values are set prior to the start of the scheme and are not updated as the scheme progresses (except under specific agreed circumstances). Ex post inputs are collected on a monthly basis using outturn data. Ex ante and ex post data are combined with the agreed models to determine the level of costs against which NGET should be incentivised.

Energy Imbalance

Energy imbalance costs are those incurred by National Grid to correct for differences between the generation supplied by the market and the demand on the system (see also Market Length).

F

Fast Reserve

The fast provision of reliable power via increased generation or reduction in demand which can be provided within two minutes, at a delivery rate of less than or equal to 25MW/minute. The reserve needs to be sustainable for 15 minutes.

Frequency Response

The electricity SO has a statutory obligation to maintain system frequency between +/- 1% of 50 hertz. The immediate second-by-second balancing to meet this requirement is provided by continuously modulating output through the procurement and utilization of mandatory and commercial frequency response.

Footroom

Footroom refers to the MW reduction capability that NGET needs to possess in order to reduce generation in response to unexpected increases in system frequency.

I

Incentivised Balancing Cost (IBC)

The final IBC is the forecast of BSIS costs against which NGET is incentivised. This is produced by the energy and constraint models at the end of scheme period, once all ex post data is available.

Income Adjusting Event (IAE)

An event defined under the transporter or transmission licence that allows for an adjustment to be made to the relevant incentive scheme.

Interconnexion France-Angleterre (IFA)

IFA is the interconnector allowing import and export of electricity between Great Britain and France.

Intertrip

Allows for the automatic removal of a generating unit from the system usually as a result of a transmission system fault. Intertrips are required to strategically manage power flows on the system, and remove at short notice potentially vulnerable circuits.

IP

Initial Proposal

M

Margin

Margin is the need for NGET to ensure that the units synchronised at any given time have sufficient spare capacity to ensure that the Short Term Operating Reserve Requirement (STORR) is met. The STORR is set such that there is a risk of only 1 in 365 days that total demand will not be able to be met.

Market Length

Market Length refers to the volume of excess demand (or supply) that exists at the point of gate closure. If generators generate more energy than they have contracted for and suppliers' customers consume less energy than their supplier has bought on their behalf, then the net effect is that there is a surplus of generation on the system. This is often described as a 'long' market. Conversely, if generators generate less energy than they have contracted for and suppliers' customers consume more energy than their supplier has bought on their behalf, then the net effect is that there is a shortfall of generation on the system. This is often described as a 'short' market.

Maximum Export Limit (MEL)

MEL is the maximum power export level of a particular BM Unit at a particular time.

N

Net Imbalance Volume (NIV)

See Market Length

National Grid Electricity Transmission (NGET)

NGET is the Transmission System Operator for Great Britain. As part of this role it is responsible for procuring balancing services to balance demand and supply and to ensure the security and quality of electricity supply across the Great Britain Transmission System.

R

Reactive Power

Power generation creates background energy which absorbs or generates reactive energy as a result of the creation of magnetic and electric fields. Reactive power needs to be provided to assist in balancing the system and retaining its integrity.

RIIO–T1

RIIO–T1 will be the first transmission price control review under the new regulatory framework known as RIIO (Revenue = Incentives+Innovation+Outputs). The RIIO model builds on the previous RPI-X regime, but is designed to better meet the investment and innovation challenge by placing much more emphasis on incentives to drive the innovation needed to deliver a sustainable energy network at value for money to existing and future consumers.

S

Sharing factors

Sharing factors describe the percentage of profit or loss which the System Operator will be subjected to if the relevant incentive performance measure falls below or exceeds the relevant incentive target.

Single Price Net Imbalance Reference Price (SPNIRP)

SPNIRP is a measure of the wholesale power price in Great Britain for each settlement period. It is derived from the United Kingdom Power Exchange (UKPX) volume-weighted reference-price and defined in NGET's BSIS Reference Document.[47]

System Operator (SO)

The entity charged with operating either the Great Britain electricity or gas transmission system. NGET is the SO of the high voltage electricity transmission system for Great Britain. NGG is the SO of the gas NTS for Great Britain.

T

Transmission Losses

Electricity lost on the Great Britain transmission system through the physical process of transporting electricity across the network. The treatment of transmission losses is set out in the BSC.

[47] An Introduction to National Grid Electricity Transmission System Operator Incentives: Balancing Services Incentive Scheme Reference Document. http://www.nationalgrid.com/NR/rdonlyres/06D6679A-1304-48FF-AC23-701645507161/44157/BSISReferenceDocument2010.pdf

Transmission Owner (TO)

There are three separate high voltage Transmission Owners in Great Britain. NGET owns and maintains the high voltage electricity transmission system in England and Wales. Scottish Hydro–Electric Transmission Limited (SHETL) is the electricity transmission licensee in Northern Scotland and Scottish Power Transmission Limited (SPT) is the electricity transmission licensee in Southern Scotland.

Appendix 9 – Feedback Questionnaire

1.13. 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?

1.14. Please send your comments to:

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