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Electricity System Operator Incentives 2013-14: System Operator Innovation Roll-Out Mechanism Determination

Final decision

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Overview:

This document sets out the Authority's determination regarding the applications received under the System Operator Innovation Roll-Out Mechanism (SO-IRM).

On 31 March 2014 National Grid Electricity Transmission (NGET) submitted two applications under the SO-IRM. The Authority has determined that neither application should receive funding.

This document sets out the process and analysis behind the determination.

Context

In its role as system operator (SO), National Grid Electricity Transmission (NGET) is responsible for balancing the GB electricity system on a continuous basis. Ofgem incentivises the SO to carry out this responsibility efficiently and economically by way of an incentive scheme. The current incentive scheme began on 1 April 2013 and will conclude on 31 March 2015. The scheme sets an annual cost target with NGET sharing a proportion of any under- or over-spends against the target up to a cap on returns or floor on losses.

Alongside this cost target, as part of the current incentive scheme we introduced the System Operator Innovation Roll-Out Mechanism (SO-IRM)[1]. This was designed to provide the SO with an opportunity to implement new techniques which would enable it to go beyond business-as-usual operation of the system and consider operation of the system beyond the two year length of the scheme. The SO-IRM achieves this by providing up to £10 million of funding for the roll-out of proven innovations that the SO can demonstrate will provide enduring benefits to consumers and would be uneconomic for the SO to roll-out during the current two year incentive scheme.

On 31 March 2014 the SO submitted two applications under the SO-IRM, for a funding total of £3,312,900. This document sets out the determination made by the Authority on these two applications.

Associated documents

Guidance Document

[1] Special Condition 4J of NGET's Transmission Licence

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Executive Summary

The System Operator Innovation Roll-Out Mechanism

Under the current Balancing Services Incentive Scheme (BSIS) the SO is able to apply for additional funding for the roll-out of proven innovations. The licence requires that the Authority is satisfied that the roll-out:
a) will deliver carbon benefits or environmental benefits;
b) will provide long-term value for money for electricity consumers;
c) will not lead to the licensee receiving commercial benefits; and
d) will not be used to fund ordinary SO activity.

Applications must be by way of a notice to the Authority. The notice must meet certain requirements under the licence, including:
a) Demonstrating how each of the four criteria above would be met; and
b) Proposing relevant outputs or other end products against which the SO Roll-Out would be assessed.

National Grid's SO-IRM applications

On 31 March 2014, NGET submitted two applications under the SO-IRM. The total funding for which NGET applied amounts to £3,312,900. Table 1 summarises the proposed roll-outs and the associated funding request.

Roll-Out	Summary description	Funding Request
Demand Turn Up	Aggregation of 10MW of demand turn up services in Scotland to reduce wind constraint costs.	£712,500
Demand Side Frequency Response	Aggregation of 13MW of domestic storage heaters in West London to provide frequency response services.	£2,600,400

Table 1: Summary of SO-IRM applications submitted by NGET

The Authority's determination

The Authority has determined that neither application should be awarded funding.

In both cases the licence requirement that the application must demonstrate that the roll-out would deliver long term benefits to consumers was not met.

While both applications involved innovations with conceptual merit, the cases presented were insufficient. As a result the Authority was not satisfied that the approval of funding would result in long term benefits to consumers and determined that no funding should be awarded.

1. Background

Chapter Summary

In this chapter we provide background to the SO-IRM and summarise NGET's applications. We also set out the process that we have followed to reach the Authority's determination. Finally, we summarise the structure of this document.

The SO-IRM

1.1. The current SO incentive scheme was introduced on 1 April 2013 and will expire on 31 March 2015. The incentive sets an annual cost target, with NGET sharing a proportion of any under- or over-spends against this target. Alongside this core financial incentive we also introduced the SO-IRM, which allows the SO to apply for funding for the roll-out of proven innovations.

1.2. Paragraph 4J.6 of Special Condition 4J of NGET's Licence sets out the requirements that a proposed roll-out must fulfil in order for the Authority to determine that funding should be awarded.

1.3. The licence condition requires that the Authority is satisfied that the roll-out of the proven innovation:
a) will deliver carbon benefits or environmental benefits;
b) will provide long-term value for money for electricity consumers;
c) will not lead to the licensee receiving commercial benefits; and
d) will not be used to fund ordinary SO activity.

1.4. Applications must be by way of a notice to the Authority[2]. The notice must meet certain requirements under the licence, including:
a) Demonstrating how each of the four criteria above would be met; and
b) Proposing relevant outputs or other end products against which the SO Roll-Out would be assessed.

1.5. In December 2013 we also published a Guidance Document and pro-forma. The Guidance Document was published to provide clarity to stakeholders about the process that the Authority would follow in assessing applications made through the SO-IRM. The pro-forma provided NGET with a template for applications.

[2] This notice can propose up to three relevant adjustments (as defined in paragraph 4J.8 of Special Condition 4J of NGET's electricity transmission licence (NGET's Licence)) to the term ROV_t for the purposes of the formula set out in paragraph 4C.1 of Special Condition 4C of NGET's licence.

1.6. Special Condition 4J states that applications must be submitted by 31 March 2014 and that the Authority must publish its determination by 30 June 2014. NGET submitted its applications on 31 March 2014, and this determination document was published on 27 June 2014.

NGET's SO-IRM applications

1.7. On 31 March 2014, NGET submitted two applications under the SO-IRM. The total funding for which NGET applied amounts to £3,312,900. Table 3 summarises the proposed roll-outs and the associated funding.

Roll-Out	Summary description	Funding Request
Demand Turn Up	Aggregation of 10MW of demand turn up services in Scotland to reduce wind constraint costs.	£712,500
Demand Side Frequency Response	Aggregation of 13MW of domestic storage heaters in West London to provide frequency response services.	£2,600,400

Our assessment process

1.8. We have assessed NGET's SO-IRM applications against the requirements of the licence.

1.9. When evaluating whether the requirements of the licence had been met we also considered the criteria set out in the Guidance Document.

1.10. Throughout the assessment process we have engaged and consulted with NGET regarding their applications. This engagement was conducted via telephone, email, and in a number of dedicated SO-IRM meetings.

Structure of this document

1.11. This document addresses each application in turn. It gives a brief summary of the application and states Ofgem's determination. It then also presents a detailed summary of the application and a summary of Ofgem's analysis.

2. 'Demand Turn Up' Application

Chapter Summary

This chapter summarises the Authority's determination on the 'Demand Turn Up' SO-IRM application.

Summary of determination

2.1. NGET's 'demand turn up' application proposed the aggregation of 10MW of demand in Scotland. This demand would be accessible to the SO as a balancing tool for the purposes of addressing overnight periods of high generation and low demand.

2.2. The application sought SO-IRM funding for the purposes of installing the equipment required to aggregate the 10MW of demand. There were also other less significant costs including for service payments and professional services for which funding was also sought.

2.3. The Authority has determined that the 'demand turn up' application should not be awarded funding. The application did not sufficiently demonstrate how electricity consumers would realise long term benefits beyond the scope of the funding mechanism. The Authority is therefore not satisfied that the application meets the conditions of the licence and has determined that the proposal is not appropriate for funding[3].

Summary of application

2.4. NGET highlighted that the GB electricity market is on a path of significant change. A number of environmental measures and market developments have increased the amount of renewable generation on the system and have resulted in the closure of many thermal generation units.

2.5. Alongside this decarbonisation of generation, NGET also highlighted increasing customer engagement to electricity, with the demand side of the market developing into a competitive alternative provider of Balancing Services (BS).

2.6. NGET noted that Demand Side Response (DSR) has grown in recent years and now competes in considerable volume in the STOR market. However, this is true for demand turn down and embedded generation increase, but not for demand turn up.

[3] And therefore there should be no adjustment to the licence term ROV_t

2.7. NGET thus summarised its 'demand turn up' application as a proposal "to set up the technological and commercial functionality to allow the trial of a demand turn up Balancing Service".

2.8. NGET suggested that a demand turn up service could be of value both as an energy balancing tool and as a constraint management tool in the case of excess wind generation. The way that NGET currently manages these examples is "primarily through the reduction in generation plant" and so a demand turn up service would offer an alternative solution.

2.9. In order to achieve this new service, NGET proposed to partner with Honeywell Building Solution. This partnership would involve the use of Honeywell's Automatic Demand Response (ADR) solution, as well as use of Honeywell's expertise in managing, contracting and installing DSR capability with industrial and commercial end users.

2.10. Specifically, NGET stated that the project would contract for and install 10MW of demand turn up based in Scotland. This demand would be chosen so as to be geographically close to wind generation. NGET would use this demand turn up service overnight in times of excess generation, during which it would be able to dispatch secure internet signals instructing participating facilities to move electricity use to the overnight period. This would increase demand and reduce generation constraint. The SO would pay a utilisation fee to contracted providers for this service.

2.11. Overall NGET suggested that the project is designed to prove the concept that geographically dispersed industrial and commercial electrical loads can be aggregated together in order to provide a demand turn up BS.

2.12. NGET claimed that this service would provide a valuable additional tool to the SO in balancing supply and demand. NGET suggested that this pilot solution would enable a DSR BS to be applied across the entire GB market.

Determination on 'Demand Turn Up' SO-IRM application

2.13. The Authority has determined that the 'demand turn up' application should not receive funding.

2.14. The Authority considered that the underlying innovation had conceptual merit. However, the information provided in support of the innovation was not adequate. The application did not sufficiently explain how electricity consumers would realise long term benefits. In particular, the application did not adequately explain:

1) The potential for benefits beyond the scope of the SO-IRM – both the scale of potential services available and how attaining these services might be achieved

2) How the success of the project would be evaluated, and how this would feed into future system operator behaviour

2.15. As well as the lack of explanation of long term consumer benefits, the application also failed in a number of other areas:

1) The cost benefit analysis was insufficiently detailed, and costs were not benchmarked

2) The argument for why funding support was necessary was insufficiently articulated

3) We had concerns over stakeholder engagement – in the short term, we felt that the speed at which customers would need to be found was unrealistic; in the long term, it was not made clear to what extent there was further customer interest in providing such services

2.16. Given the above shortcomings of the application, the Authority has deemed that the application does not satisfy the conditions of the licence and is therefore not appropriate for funding.

3. 'Demand Side Frequency Response' Application

Chapter Summary

This chapter summarises the Authority's determination on the 'Demand Side Frequency Response' SO-IRM application.

Summary of determination

3.1. NGET's 'demand side frequency response' application proposed the aggregation of 13MW of demand in West London tower blocks for the purposes of frequency response service provision.

3.2. The application sought SO-IRM funding for installation and platform development costs as well as for smaller cost components such as service payments and professional services.

3.3. The Authority has determined that the 'demand side frequency response' application should not be awarded funding. The application did not sufficiently demonstrate the long term benefits that consumers would realise beyond the scope of the mechanism. The Authority is therefore not satisfied that the application meets the conditions of the licence and has determined that the application is not appropriate for funding[4].

Summary of application

3.4. NGET suggested that frequency control is "probably the most important role that the GB SO manages". NGET explained that it is required to maintain frequency between operational limits of 49.8Hz and 50.2Hz and that it achieves this through procurement of a range of services.

3.5. NGET suggested that the increasing generation from renewable sources brings with it frequency related issues. NGET said that a greater proportion of renewable generation compared to conventional generation within the energy mix introduces challenges with regards to the management of system inertia[5]. With fewer conventional generators in merit, additional costs will be incurred if conventional generation alone is used to manage system inertia issues.

[4] And therefore there should be no adjustment to the licence term ROV_t

[5]The inertia of the system is a measure of its momentum. Greater inertia means a greater resilience to frequency issues. Synchronous generation, such as large coal and gas fired stations, contribute considerably to system inertia, while wind farms and other renewables do not, meaning a more renewables heavy system has greater exposure to frequency issues.

3.6. NGET highlighted that while renewable energy sources can provide frequency response services this is not always on a reliable or cost-effective basis. NGET noted that demand side response has the characteristics to provide frequency response services, with significant potential for service provision in the domestic demand sector. Grid noted however that the technical and commercial frameworks for this sector remain in their infancy.

3.7. NGET proposed a roll-out in collaboration with VCharge and Westminster City Council. The roll-out would involve the installation of modified VCharge technology to 903 domestic flats in Westminster. This technology would aggregate 13MW of demand from electric storage heaters in these flats to provide an instructed dynamic frequency response service. The speed of this response would be <2s and so would contribute towards system inertia management.

3.8. NGET noted that the technology is well established in US markets where it is already used as a balancing tool. NGET would be able to access this aggregated domestic demand for the purposes of fast frequency response.

3.9. Overall Grid stated that this innovation roll-out would offer an opportunity to develop the domestic demand side response for the provision of frequency control services to assist the SO. Further NGET suggested that the roll-out would develop demand side ancillary service provision beyond the timescale of the roll-out mechanism.

Determination on 'Demand Side Frequency Response' SO-IRM application

3.10. The Authority has determined that the 'demand side frequency response' application should not be awarded funding.

3.11. The Authority considered that the underlying innovation had conceptual merit. However, the information provided in support of the innovation was not adequate. The application did not sufficiently set out the long term benefits that would be realised by consumers as a result of the roll-out. In particular, the application did not explain:

1) How the roll-out of the innovation would be scaled up after the SO-IRM

2) How future customers would be found/targeted and what this would mean for costs of service provision

3) What a successful roll-out would look like and how this would fit into the SO's business practices going forward

3.12. As well as the insufficient evidence for long term consumer value, there were a number of other issues with the application:

1) The cost benefit analysis was insufficiently detailed and did not provide convincing justification of the costs of the roll-out and beyond

2) There was a shortage of customer engagement

3.13. Given the above issues with the application, the Authority deems that the application does not satisfy the conditions of the licence and is thus not appropriate for funding.

4. Next Steps

Chapter Summary

This chapter considers issues with the SO-IRM and requests stakeholder engagement on ways forward for the mechanism.

4.1. On 17 June 2014 we published a consultation seeking views on the Electricity System Operator incentive scheme from 2015[6]. The consultation seeks views on the incentives including the SO-IRM.

4.2. We are seeking to learn from the experience of the initial process of considering applications under the SO-IRM. We would welcome feedback through the consultation from directly and indirectly affected parties regarding their experiences and views with respect to the SO-IRM.

4.3. We would particularly welcome views on some of the following areas:

1) The balance of time between the preparation of bids for funding, the assessment of those bids, and the roll-out of measures, and whether this balance has any impact on the possible innovations

2) The impact (if any) from the absence of a competitive element in the bidding, in particular on the quality of the ideas and applications submitted

3) The impact of a targeted funding mechanism on the incentive of the SO to innovate in a business as usual context

4) Whether there are alternatives to the SO-IRM that could better drive innovative system operation

4.4. If you have any views on these or any other issues in relation to the SO-IRM please respond through the "Electricity System Operator Incentives: Incentives from 2015" consultation which can be found through the link in the footnote below. The consultation closes on 15th July 2014.

4.5. Through responses to this consultation we would be interested in stakeholder views regarding what they see as the benefits and shortcomings of the SO-IRM. We are interested to learn how stakeholders see the role both of innovation generally and of this specific funding mechanism in incentives packages going forward.

[6] https://www.ofgem.gov.uk/ofgem-publications/88216/extensionconsultationjune2014final.pdf