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for energy consumers

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Dear Company Secretary,

**Decision on funding for work package 2.4 of the Enhanced Frequency Control Capability (EFCC) project**

I am writing with details of our decision on funding for one of your innovation projects.

On 25 August 2014 you, National Grid Electricity Transmission (NGET), submitted the project 'Enhanced Frequency Control Capability (EFCC)' for funding through the Electricity Network Innovation Competition (NIC). Following a recommendation from our Expert Panel<sup>1</sup>, we awarded funding for the project on 19 December 2014, subject to you complying with the Project Direction.<sup>2</sup>

Work Package 2.4 represents a significant proportion of the project costs and is stated in the EFCC full submission as:

*"The capabilities of storage resources will be tested and demonstrated with local and external control."*

In making the decision to fund this project, we and the Expert Panel raised some concerns about the construction of a new battery storage facility instead of using an existing one and also about the economic benefits of any potential learning. The following condition was therefore set as part of the Project Direction:

*"The Funding Licensee must secure consent from the Authority before accessing the funds, £1,122,820, for work package 2.4. The Funding Licensee must submit an application to the Authority which presents options for work package 2.4. As part of this application, the Funding Licensee must conduct an investigation into existing battery storage facilities and trials in the UK, considering both technical and commercial information, to determine if existing facilities and/or trials can be used for the Project. The Funding Licensee must also present cost benefit analysis of potential learning from this work package against the cost to consumers. The Funding Licensee must present this information in a report to the Authority by 30 June 2015."*

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<sup>1</sup> Electricity Network Innovation Competition: 2014 funding decision  
[https://www.ofgem.gov.uk/sites/default/files/docs/2014/11/electricitynic\\_decision\\_document\\_2014\\_0.pdf](https://www.ofgem.gov.uk/sites/default/files/docs/2014/11/electricitynic_decision_document_2014_0.pdf)

<sup>2</sup>Project Direction ref: NGET / Enhanced Frequency Control Capability / 19 December 2014  
[https://www.ofgem.gov.uk/sites/default/files/docs/2015/01/enic\\_project\\_direction\\_efcc\\_final\\_0.pdf](https://www.ofgem.gov.uk/sites/default/files/docs/2015/01/enic_project_direction_efcc_final_0.pdf)

*Based on the Funding Licensee's application the Authority will determine whether the funds for work package 2.4 will be released. If the Authority determines not to release these funds, the funds will be returned to customers."*

The condition, therefore, has two components:

- 1) Investigation of existing storage facilities; and
- 2) Cost benefit analysis

### **Investigation of existing storage facilities**

To satisfy the requirements of the condition, on 30 June 2015, you submitted a Battery Storage Investigation Report to us, which we assessed. You emphasised that the innovation comes from pairing storage with solar PV and we were satisfied that there were no other suitable existing storage facilities available for this aspect of the project. In this respect, you had met the first component of the condition: you had demonstrated that existing facilities and/or trials would not be suitable for the project.

### **Cost benefit analysis**

The condition stipulated that you provide a cost benefit analysis of potential learning against the cost to consumers of this work package. In your initial report, you produced a cost analysis only. None of the benefits discussed in the report were monetised.

We asked some supplementary questions on 14 August 2014 and subsequently arranged to have a meeting on 1 October 2015 with your EFCC project team. At the meeting we set out our requirements clearly and were in agreement with the EFCC project team regarding the detail in the cost benefit analysis which we expected. We also agreed that you should include an evidenced-based projection of the number of solar farms that would roll out the hybrid solution which would provide an input to the CBA. We gave you an opportunity to submit an updated report.

You submitted an updated report on 6 November 2015 to us, which we have reviewed. A summary of our assessment is below.

We asked you to show how economically viable it may be for a solar farm to invest in battery storage. We expected to see the potential learning from this NIC project and the related monetised benefits, to a developer, of investing in battery storage. You presented a cost benefit analysis which included only the payment for enhanced frequency response as a benefit.

We also asked you to identify the number and MW capacity of existing solar farms of the minimum practical size or greater for the deployment of this solution. You identified that the minimum practical size would be 4MW based on the trial. You provided a graph showing a combination of both existing farms and those in all stages of development. There is no isolated figure for the number and MW of existing solar farms of the minimum practical size and you did not provide an explanation for this.

The CBA hinges on an assumption that the combination of solar PV and battery storage will represent 30-45% of the market share for enhanced frequency response. Battery roll-out projections are based on meeting this. There is no justification or explanation of this market share figure and, should the outturn market share be different, as you acknowledge in your report, the benefits will also be different. There is therefore considerable uncertainty over a key driver of, and the subsequent potential scale of, the available benefits.

The capital cost of a battery is identified as £1,122,820 which you have predicted will come down in future, but you have made no projection of the estimated decrease in cost. We expected to see justification of all figures used.

The benefit is identified as the payment for frequency response, which you have assumed to be ██████████ as this is the approximate current cost of existing frequency response. You note that this could change significantly in the future and you assessed the future costs of frequency response using both linear and quadratic models. The quadratic model suggests that costs will peak at some point and then decrease. Your assessment forecasts costs peaking at just under £1bn/year, but there is no indication of how the costs may decrease or an explanation of how you derived the specific quadratic equation used in the analysis.

We expected a broader investigation of benefits to developers and for these to be either included or disregarded from the CBA with justification. This would inform overall understanding of the economic viability of solar farm developers investing in battery storage.

You included a spreadsheet showing the battery storage NPV calculations with the report, but have not provided an explanation of the spreadsheet. An accompanying discussion was necessary as there are several figures in the spreadsheet which are unexplained.

In summary, the CBA includes a number of assumptions that have not been explained and/or supported by evidence. Although we acknowledge the inevitable uncertainty with any assumptions, we would expect to see thorough analysis and robust justification of the assumptions adopted to make the case. We made this expectation clear at the meeting on 1 October 2015. Absent such justification, we are not satisfied that you have presented a robust cost benefit analysis of potential learning from this work package against the cost to consumers.

## Decision

We have reviewed your submissions in accordance with the requirements set out in the Project Direction. We conclude the following:

- 1) you have made the case for the requirement for a new storage facility for this trial; but
- 2) you have not made a convincing economic case for Work Package 2.4.

As you have not been able to satisfy both components of the condition, we have decided not to release the funds for work package 2.4. £1,122,820 of the project costs will be returned to customers using the NIC Funding Direction for 2016.

Yours faithfully,



Andy Burgess  
Associate partner, Energy Systems Integration  
For and on behalf of the Authority