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Smart grid capital expenditure within price controls

1 Introduction

This paper outlines how smart grid capital expenditure is determined in the price controls that govern the operations of system operators in Northern Ireland, Great Britain and the Republic of Ireland. Whilst the focus on the paper is smart grid investment initiatives, the paper also provides information on smart meter roll out.

2 Northern Ireland Electricity

Northern Ireland Electricity (NIE) is subject to a price control by the utility regulator. Due to NIE's monopoly position, the Utility Regulator in consultation with stakeholders sets the amount of revenue NIE can earn. The aim of the price control mechanism is to ensure that NIE cannot abuse its *'monopoly position by charging prices which are excessive, and also to ensure that an appropriate level of service is provided to customers'*.

In addition to setting the amount of money the company can earn in a given period, the price control also sets the amount of capital expenditure (CAPEX) NIE can spend in the same period.

In its final determination for RP5 the Regulator separated NIE's CAPEX into three funds dependent on the type of activity:

- Fund 1: planned and unplanned asset replacement and refurbishment;
- Fund 2: load related investment, metering (excluding smart meters), connections and less predictable investment; and
- Fund 3: large projects for renewable generation or interconnection, where there is material uncertainty over the timing and level of expenditure.¹

Capital expenditure on smart grid trials was included in Fund 3. Fund 3 recognised that the amount of investment required in the areas it covered was uncertain. As such, it was proposed that Fund 3 projects would be assessed on an individual basis, 'as the need and cost is determined' by NIE during the lifetime of the RP5 period.² On this approach, the Regulator has stated:

Fund 3 is intended to cover large projects for which there is even greater uncertainty than in Fund 2, both as to timing and cost. This covers, in particular, smart metering and investments in the network required to accommodate the expansion of renewable energy that is anticipated to take place in order to satisfy EU renewable energy targets. The operation of this fund is straightforward: there are no allowances at this stage, but NIE T&D has complete freedom to present proposals for projects at any stage in RP5 and they will be approved to the extent that they are necessary and efficient. This approach insulates NIE T&D from essentially all of the (substantial) risk associated with these projects.³

Due to this approach, the allocated expenditure for smart grid investment included in the Regulator's RP5 Final Determination was designated 'to be determined'.⁴

On the 30 April 2013, the Regulator referred the NIE RP5 price control determination to the Competition Commission (CC), following NIE's rejection of the final determination. The CC's final determination changed the approach to smart grid investments during the price control period. Rather than a project-by-project approach, the CC included smart grid investments in its upfront cost assessment. Explaining this change of approach the CC stated:

...while we included NIE's proposed smart grid initiatives as part of our upfront cost assessment... there may be further potential smart grid initiatives and opportunities that NIE had not identified in its submission to us which could arise during the price control period. However, we were

¹ The Utility Regulator RP5 Final Determination Main Paper

http://www.uregni.gov.uk/uploads/publications/RP5_Main_Paper_22-10-12_FINAL.pdf

² *Ibid*

³ The Competition Commission Northern Ireland Electricity Limited price determination <https://assets.digital.cabinet-office.gov.uk/media/534cd495ed915d630e00003f/final-determination.pdf>

⁴ The Utility Regulator RP5 Final Determination Main Paper

http://www.uregni.gov.uk/uploads/publications/RP5_Main_Paper_22-10-12_FINAL.pdf

concerned that a project-by-project approval process for such initiatives could bring detailed regulatory micro-management and administrative burden during the price control period...⁵

In setting out the NIEs CAPEX requirements, the CC determination allowed for an expenditure of £3m on smart grid initiatives.⁶

The Regulator also included smart metering CAPEX in fund 3. The amount of CAPEX allowed for smart metering rollout was designated 'to be confirmed'. Again, the purpose of including this CAPEX in fund 3 was to allow a determination within the price control period. On the smart meter programme, the CC stated:

Our determination is that a form of volume-driver mechanism is appropriate for NIE's CAPEX in relation to electricity meters. In addition to upfront forecasts of NIE's CAPEX on electricity meters, the revenue restriction in NIE's Licence conditions will adjust mechanistically according to the out-turn volumes of metering investments that NIE carries out. The adjustment will be calculated by reference to unit cost allowances for different categories of metering CAPEX. This mechanism helps address substantial uncertainty about the volumes of metering investment that NIE will need to carry out.

The mechanism we determined for metering CAPEX is focused on conventional electricity meters (including keypad meters) and is not intended to accommodate a potential future transition to smart meters. If the smart meter programme in Northern Ireland means that changes are needed to NIE's maximum regulated revenue before 30 September 2017, we expect the UR and NIE to make use of either the change of law provision in the existing licence conditions (which we propose to retain) or a licence modification.⁷

This approach was taken as both NIE and the Regulator's submission to the CC noted that there was currently insufficient information available to allow for an upfront forecast of smart metering costs up to 2017. As such, the cost remains within fund 3 with the proviso that a change of law or licence modification will be secured should within period determination be required.

3 Great Britain

OFGEM regulates the transmission and distribution companies in GB. Their price controls set out the allowed revenue for each company; they also include incentives to ensure system operators innovate and operate in a more efficient way.

⁵ The Competition Commission Northern Ireland Electricity Limited price determination <https://assets.digital.cabinet-office.gov.uk/media/534cd495ed915d630e00003f/final-determination.pdf>

⁶ *Ibid*

⁷ *Ibid*

The current distribution price control, which operates until March 2015, OFGEM established the Low Carbon Networks (LCN) Fund. The fund offers £500m in support to distribution network operators (DNOs) to trial new technology, operating and commercial arrangements. The fund places the cost of funding innovation on customers who typically fund 90% of overall project cost with DNOs funding the remaining 10%. To ensure that customers get the best return for their investment, DNOs are required to share any learning from trial projects to encourage the roll-out of successful trials and the realisation of network cost/carbon savings.⁸

OFGEM has divided the fund into two tiers. Tier one of the fund enabled first tier projects to recover a proportion of expenditure incurred on small-scale projects. Eligible trial projects include:

- A specific piece of new (i.e. unproven in Britain) equipment (including control and communications systems and software) that has a direct impact on the Distribution System;
- A novel arrangement or application of existing Distribution System equipment (including control and communications systems and software);
- A novel operational practice directly related to the operation of the Distribution System; and
- A novel commercial arrangement with a Distribution System User.⁹

Furthermore, to be eligible projects must demonstrate that they:

- Accelerate the development of a low carbon energy sector and have the potential to provide net financial benefit to future or existing customers;
- Have a direct impact on the operation of a DNO's Distribution System;
- Generate new knowledge that can be shared amongst all DNOs;
- Focus on network methods that are at the trial stage;
- Do not lead to unnecessary duplication; and
- Comply with the LCN Fund Governance Document.

Tier two of the fund provides annual competitive funding for *'the development and demonstration of new technologies, operating and commercial arrangements'*. Up to £64m has been made available each year. Funding is awarded to the *'best innovation projects which help DNOs understand what they need to do to provide environmental benefits, cost reductions and security of supply as Great Britain moves to a low carbon economy'*.¹⁰

⁸ OFGEM Low Carbon Networks Fund Governance Document v.6

<https://www.ofgem.gov.uk/ofgem-publications/45703/low-carbon-networks-fund-governance-document-version-6.pdf>

⁹ OFGEM Low Carbon Initiative First Tier projects <https://www.ofgem.gov.uk/electricity/distribution-networks/network-innovation/low-carbon-networks-fund/first-tier-projects>

¹⁰ OFGEM Low Carbon Initiative Second Tier projects <https://www.ofgem.gov.uk/electricity/distribution-networks/network-innovation/low-carbon-networks-fund/second-tier-projects>

At transmission level, the RIIO-T1 price control (2013-2021) introduced the Electricity Network Innovation Competition (NIC). The NIC is an annual opportunity for transmission companies to compete for funding to support the development and demonstration of new technology, operating and commercial arrangements. The fund provides up to £27m support. As is the case with the LCN, all customers fund successful NIC projects through transmission use of system charges.¹¹

In GB, the Department for Energy and Climate Change is responsible for smart meter roll out. The Department has outlined a programme for the installation of 50 million smart meters to homes and non-domestic sites by 2020. The energy supply companies are responsible for meter installation, with a newly formed Data and Communications Company responsible for development of shared infrastructure necessary for smart meters to operate consistently for all consumers, regardless of their energy supplier.¹² The total estimated cost of the project is £11.5bn, with cost recovered through customer bills.¹³

4 Republic of Ireland

The Commission for Energy Regulation (CER) is responsible for setting price controls for the distribution system operator (ESB Networks), the transmission system operator (TSO) (EirGrid) and transmission asset owner (TAO) (ESB Networks) in the Republic of Ireland. The current price control, known as PR3, runs from 2011 to 2015.

CER notes:

...under the PR3 determination the DSO was allowed an €18.2m fund to carry out research and development and sustainability activities. This was the first time the CER had made such a provision. The provision was made to allow for the DSO to explore technological advances in areas such as smart grids, generation integration and adaption of new network devices to support the integration of renewable generation into the network and to improve quality of supply.¹⁴

The DSO determination also included €500m increase in expenditure for smart metering development.¹⁵

¹¹ OFGEM Electricity Network Innovation Competition (NIC) - Funding Direction <https://www.ofgem.gov.uk/ofgem-publications/85453/signednicfundingdirection.pdf>

¹² DCC Factsheet http://www.smartdcc.co.uk/media/5694/dcc_factsheet_1_-_about_us_and_our_commercial_framework_-_layout.pdf

¹³ House of Commons Library Standard Note – Smart Meters 11 September 2014
<http://www.parliament.uk/Templates/BriefingPapers/Pages/BPPdfDownload.aspx?bp-id=sn06179>

¹⁴ Commission for Energy Regulation Mid-Term review of WACC applying to the Electricity TSO and TAO and ESB Networks Ltd for 2014 to 2015
<http://www.cer.ie/docs/000801/CER14026%20WACC%20Review%20Decision%20Paper%20Final.pdf>

¹⁵ Commission for Energy Regulation Decision on 2011 to 2015 distribution revenue for ESB Networks Ltd
<http://www.cer.ie/docs/000046/cer10198.pdf>

The TSO was allocated €2M for promotion of research over the PR3 period, the determination was not specific with regard to what this money was to be spent on.

CER are currently:

... in the process of commencing its PR4 price review for the prospective period 2016-2020 (incl). This will also include a review of the efficiency of expenditure of allowed revenues from the PR3 period. Smart Grid and Smart Metering are two areas which CER has singled out for particular attention and discussion with the regulated companies on appropriate expenditure amount and subject. The regulated companies have been asked to make specific submissions on both areas.

CER will be specifically assessing the outcomes of the allocations for Smart Metering and Smart Grid from the PR3 period.

*The Smart Metering project, while progressing materially, has not reached the stage envisaged in 2009, so the expenditure for the PR3 period will be a small fraction of the allocated allowance, most of which will roll forward into PR4 where the major expenditures on acquisition and installation of Smart Meters will occur.*¹⁶

¹⁶ Email correspondence with CER 10 October 2014