



**MARKETS**



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**INNOVATION**

**RIIO-T1 Stage 4  
National Grid System Operator  
Electricity and Gas  
Capex and Opex  
Initial Assessment – Summary  
Report**

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## Summary Report

National Grid (NG) is the System Operator (SO) for Great Britain for both gas and electricity. The current price review period for NG as Transmission Owner (TO) and SO ends in 2012/13. Ofgem is now undertaking a price control review for the SO in accordance with the new RIIO price control principles, where RIIO stands for “Revenue = Incentives + Innovation + Outputs” for the eight year period starting in 2013/14 (this is known as RIIO-T1).

The SO is concerned with maintaining security and balancing the system such that reasonable demand of electricity and gas can be met. Given this balancing function NG has capital items (referred to as SO Internal Capex) which allow it to perform these tasks. NG also has opex to support the SO business.

In accordance with the price control process, Ofgem has been reviewing the proposed SO Capex and Opex allowances, for both electricity and gas, and the request made by NG in respect of such allowances for the RIIO-T1 period and has appointed technical consultants to support them in setting allowances. PPA Energy has been retained by Ofgem to provide this support.

RIIO allows for a fast-track approach, where business plans are particularly well justified. Following an initial assessment Ofgem decided that the NG electricity and gas SO businesses were not, on this occasion, considered suitable for fast tracking. It was therefore concluded that they should proceed to the detailed analysis stage. This report represents a summary of the first version of the final report associated with this stage.

Initially NG provided its business plans for the RIIO-T1 period in July 2011. Following Ofgem’s decision that neither National Grid Electricity Transmission (NGET) nor National Grid Gas (NGG) SO should be selected for the fast-tracking process NG was requested to revise their business plans for submission in March 2012. This report is based on a review of those plans.

Both NGET and NGG have included significant increases in their capex and opex expenditure in the RIIO-T1 period compared to that in preceding years. NG has sought to justify this on the basis, among other things, of the impacts on requirements of large levels of intermittent renewable generation being connected to the system, changes to the levels of consistency in gas flows around the UK, and the need to keep its portfolio of systems reliable, secure and up-to-date. In addition there is significant expenditure proposed on data centres.

NGET proposes capital expenditure of £270.8 million and total operating expenditure of £652.4 million for the period, resulting in a total expenditure of around £923.2 million. These figures exclude data centre capital expenditure and PPA Energy’s estimates of data centre opex expenditure.

NGG proposes capital expenditure of £224.1 million and operating expenditure of £311.7 million for the period, resulting in a total expenditure of around £535.8 million. These

figures exclude data centre capital expenditure and PPA Energy's estimates of data centre opex expenditure.

In reviewing the business plans a number of concerns have been identified. Some of the most significant are listed below. The level of concern in respect of each individual bullet points varies between electricity and gas:-

- The scale of the capital and operating costs increases;
- The overall approach appears technology rather than business driven;
- In some cases, uncertainty about the nature (or indeed existence) of the actual requirements and their timing, leading to certain of the proposed projects appearing speculative and unclear;
- Emphasis is placed on automation with no discussion of what happens if the automatic systems fail;
- Some of the solutions appear overly complex perhaps missing simpler basic solutions;
- Insufficient emphasis has been placed on the role of other stake holders. Discussions are taking place and the outcome is likely to influence requirements;
- Implementation of the large capital programme will necessitate continuous development with the attendant risks associated with interacting systems;
- The assumptions within the business plans regarding the refresh and replacement policy (driven by the IT Strategy described by NG) results in "worst case" levels of expenditure; and
- There is a heavy dependency on external suppliers based on 5 year contracts and there is a risk that they may not renew.

At this stage, requirements regarding data centres are not yet clear and it therefore has been assumed that electricity and gas SO expenditure on them will be dealt with separately from the other allowances. As a result all data centre Capex and Opex allowances for both electricity and gas have been removed from the proposed allowances outlined below.

Xoserve is the Gas Transporters (GT) Agency whose objective is to provide a common system and service interface between GTs and the wider industry. Gemini is the system for gas capacity management, energy balancing and associated invoice processing. Gemini is owned by NGG, and operated by Xoserve. Ofgem has recently appointed consultants to undertake a review of Xoserve's funding, governance and ownership arrangements, as part of the gas distribution price control. The consultants have put forward a number of options for change and Ofgem has indicated a preference for establishing a co-operative, non-profit

body. The details of the arrangement (for example, the degree of separation of supplier and GT services) are yet to be determined and Ofgem is initiating an implementation project to take all aspects forward. NGG has expressed concerns that the Xoserve review is distribution focussed, and that transmission needs will not be taken into account.

Given the high level of uncertainty over the future arrangements for Xoserve, and the funding implications for Gemini, it is proposed that this expenditure is not suitable to be considered as part of the allowances proposed below. Thus, apart from some transitional expenditure for projects nearing completion, it is proposed that the Gemini related expenditure is removed from the allowances, and considered separately once the outcome of the Xoserve review has concluded and the implications for the GSO are clear. This is the approach that has been adopted in the gas proposals below.

The approach in this review has been to focus on an appraisal of each individual major project with, in electricity (which has a very large number of projects) a particular emphasis on those described as enhancements. The rationale that has been adopted has the following characteristics:

- Deferring the more speculative enhancement projects
- Creating a more viable workload with less risk
- Providing more time to clarify requirements
- Taking a conservative view of the rate of expansion of wind capacity enabling some work to be deferred
- Identifying those developments likely to provide most benefit to consumers
- A consideration of opportunities to share risk where NGET can exercise control
- Taking account of projects where refresh expenditure rapidly follows the implementation of a system

In order to establish the limits of an overall range within which final SO capex and opex allowances would be expected to be likely to fall two cases have been established. These cases differ slightly between electricity and gas but broadly consist of what is considered to be a viable development programme with less risk in implementation or risk of solving the wrong problem.

In the case of the Electricity System Operator (ESO):

- Case 1 is based on the assumption of a less aggressive build up of wind capacity and associated system problems; and

- Case 2 proposes higher allowances should the build up of wind capacity occur earlier than assumed in Case 1.

In the case of Gas System Operator (GSO):

- Gas Case 1 is based on lower rates of increasing volatility in supply and demand patterns than NGG's business plan and the low case of regulatory driven change; and
- Gas Case 2 is based on higher rates of increasing volatility in supply and demand patterns than Case 1 and regulatory driven change in line with NGG's business plan.

In both cases as explained above, allowances in respect of data centres and Xoserve/Gemini have been excluded.

Thus Cases 1 and 2 represent the boundaries of the range within which final SO capex and opex allowances would be expected to be likely to fall

Summarised overleaf are the results of this work for electricity and gas capex and opex

### Electricity SO Capex

Case	RIIO £million
Case 1	190.5
Case 2	217.6
NGET March 2012 business plan less data centre	270.8

RIIO-T1 £ million	Case 1	Case 2	NGET business plan less data centres	Case 1 percentage change on NGET plan	Case 2 percentage change on NGET plan
2014	37.3	37.8	43.5	-14.3%	-13.2%
2015	31.4	33.3	36.9	-14.9%	-9.8%
2016	25.4	28.2	33.0	-23.2%	-14.5%
2017	24.6	25.5	32.2	-23.6%	-20.6%
2018	27.4	28.4	33.2	-17.5%	-14.3%
2019	13.4	17.4	29.3	-54.4%	-40.8%
2020	18.7	23.5	31.2	-40.1%	-24.6%
2021	12.4	23.4	31.4	-60.6%	-25.5%
<b>Total less data centres</b>	<b>190.5</b>	<b>217.6</b>	<b>270.8</b>	<b>-29.6%</b>	<b>-19.6%</b>

### Electricity SO Opex

RIIO-T1 OPEX	£ million
Case 1	552.505
Case 2	585.807
NGET business plan	652.412

RIIO-T1 Opex (£ million)	Case 1	Case 2	NGET business plan	Case 1 % change	Case 2 % change
2014	66.7	70.4	77.7	14.2%	9.4%
2015	68.0	71.9	79.8	14.7%	9.8%
2016	69.1	73.1	81.3	15.1%	10.0%
2017	69.5	73.7	82.2	15.5%	10.3%
2018	69.4	73.7	82.2	15.5%	10.3%
2019	69.2	73.5	82.0	15.6%	10.4%
2020	69.9	74.3	83.0	15.8%	10.5%
2021	70.7	75.2	84.2	16.1%	10.7%
<b>Total</b>	<b>552.5</b>	<b>585.8</b>	<b>652.4</b>	<b>15.3%</b>	<b>10.2%</b>

### Gas SO Capex

Case	Capex in RIIO-T1 (£ million)	% Change on NGG plan
Case 1	122.0	25.2
Case 2	146.7	10.0
NGG excl. Data Centres and Xoserve	163.1	

RIIO-T1 £million	Case 1	Case 2	NGG*	Case 1 % change on NGG plan	Case 2 % change on NGG plan
2014	34.5	34.4	34.4	0.4	0.0
2015	27.0	27.4	27.9	-3.1	-1.8
2016	17.0	18.5	18.9	-10.1	-1.9
2017	9.2	15.3	16.6	-44.8	-8.3
2018	9.3	13.2	16.2	-42.5	-18.3
2019	5.5	11.2	17.8	-69.0	-36.8
2020	8.2	14.2	17.9	-54.0	-20.7
2021	11.3	12.6	13.5	-16.5	-7.0
<b>RIIO-T1</b>	<b>122.0</b>	<b>146.7</b>	<b>163.1</b>	<b>-25.2</b>	<b>-10.0</b>

\*Excluding Data Centres and Xoserve (but does include Xoserve transitional allowance)

### Gas SO Opex

Case	RIIO-T1 Opex (£m)
Case 1	260.4
Case 2	291.3
NGG excl. Data centres	311.7

RIIO-T1 Opex £m	Case 1	Case 2	NGG (excl. data centres)	Case 1 % change	Case 2 % change
2014	31.7	35.6	38.2	-16.89	-6.73
2015	33.6	37.6	40.2	-16.39	-6.53
2016	33.5	37.4	40.1	-16.46	-6.55
2017	31.8	35.6	38.0	-16.19	-6.45
2018	31.9	35.7	38.2	-16.35	-6.51
2019	32.4	36.2	38.8	-16.47	-6.56
2020	32.6	36.5	39.0	-16.46	-6.56
2021	32.8	36.7	39.3	-16.56	-6.59
<b>Total</b>	<b>260.4</b>	<b>291.3</b>	<b>311.7</b>	<b>-16.47</b>	<b>-6.56</b>

One feature of the RIIO process is that it covers a long period of time – some eight years. In the case of the electricity and gas SOs this coincides with a period that may include a very significant amount of change. Inevitably this results in a considerable level of



uncertainty in regard to some of the developments that are envisaged by NG. This raises the question as to whether uncertainty mechanisms may be appropriate.

In the case of gas, NGG has proposed a mechanism to cover GB and EU regulatory changes. Some expenditure has been included in NGG's plan that would – if not spent – be returned to customers. PPA Energy is supportive of this although a large element of the possible expenditure relates to the Gemini system and, thus, has been included in that portion that has been removed from allowances as it will need to be separately assessed once the future operating regime for Xoserve has been established (as discussed above). The remaining part of the allowances which is subject to this mechanism are included within PPA Energy's proposed GSO capex allowances and amount to £10.5 million in RIIO-T1 in Case 1 and £19.6 million in Case 2.

In the Case 1 and Case 2 proposals that PPA Energy has derived and are included within this report a number of projects have been deferred due to their speculative nature. Whilst it is difficult to justify these projects at this point in time, PPA Energy recognises that it is possible that the challenges foreseen by NG may become more pressing during the timeframe of the RIIO-T1 period as circumstances develop. In these circumstances uncertainty mechanisms with suitable triggers and levels of materiality may become useful. In this report it is suggested that for electricity such a mechanism could be triggered by wind capacity exceeding a particular level. Thus in the event that the level of wind capacity exceeds, for example, 20% of total system capacity in the RIIO-T1 period NGET would be able to present a case for approval by Ofgem for further allowances. Similarly for gas, a quantifiable trigger could be defined, relating to the increased volatility experienced by the SO and the operational challenges associated with this (for example, relating to the frequency and magnitude of linepack variations, absolute error of demand forecast, or the magnitude of CCGT gas demand variation) again providing NGG with an opportunity to present a case for approval by Ofgem. The final decision on the appropriateness of uncertainty mechanisms will be made by Ofgem.