Incentive Regulation of UK Electricity and Gas Networks:

From RIIO-1 to RIIO-2

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The regulatory and operating context of energy networks is dynamic and constantly evolving. Achieving a multitude of economic, environmental, social and policy objectives is a challenging task for the sector regulators. The UK energy regulator Ofgem has proposed a revision of its approach to energy network price control and incentive regulation.

The RIIO-1 model, Revenue = Incentive + Innovation + Output has been the longest network price control (8 years) in the UK. It contains three price controls: gas and electricity transmission (RIIO-T1), price control for gas distribution (RIIO-GD1), and the price control for electricity distribution (RIIO-ED1). A revised RIIO-2 framework has been proposed.

We investigate the main differences from RIIO-1 and the planned RIIO-2, by assessing the key rationales and the possible impacts of the proposed changes in key incentive mechanisms. Jamasb argues, that due to the indications that under RIIO-1 most companies have earned a high return on retained earnings (RORE), regulators have been motivated to revisit and improve the framework for RIIO-2.

Three main sources of excess RORE in RIIO-1 are identified. Firstly, a significant Totex (Total expenditure) underspend, secondly, an over-performance in some targeted incentivised areas, and thirdly, real price effects during the regulatory period.

Fundamentally, the paper discusses aspects of how a **revised RIIO model** can pursue the objective of an **approach** to **regulation** of **energy networks** that is **fit for future challenges**. It does not aim to provide a definitive assessment of the cumulative effects of incentive mechanisms of RIIO-2. Nonetheless, a few overarching conclusions are drawn.

While the role of cost-saving for efficient and affordable energy services is undeniable, an important function of energy networks is to support the delivery of a low-carbon energy system future. Hence, the benefits of investments and spending should be viewed in a context of the overall system benefits they create, rather than a network service in a narrow sense.

Because RIIO is an **output-oriented approach**, information asymmetry is more critical than in the more common input-oriented models**.** In this regard, Jamasb argues that the **Information Quality Incentives** (**IQI**) scheme with ex-ante incentives, a Totex incentive mechanism, did not sufficiently tackle the information asymmetry problem. Instead, it might have become a source of excess RORE through inflated cost forecasts. The planned replacement of IQI with a **Business Plan Incentive** (**BPI**) scheme is likely to reduce the profits gained from Totex reduction and excess RORE.

We note that the desire for reducing **information asymmetry** and achieving multiple objectives need not result in complex incentive models. Correspondingly, the number of targeted incentive schemes should, where possible, be reduced to a minimum in order to promote overall economic efficiency of the utilities.

On the Information Quality Incentives (IQI) and role of menus. RIIO-1 has relied on the IQI scheme for information and forecasts from companies, which has insufficiently tackled the information asymmetry problem. Whether the origin of this are (i) companies own forecasts, (ii) companies past performance, or (iii) independently determined by the regulator, a lower reliance on IQI or companies as an information source are argued to be able to reduce the cost of information asymmetry. Correspondingly, schemes based on the proposed Business Plan Incentive (BPI), benefit sharing factors and increased confidence in own assessments is proposed.

On the Totex Incentive Mechanism (TIM) **and Blended Sharing Factors** (BSF). A reduction of the sharing factors for Totex is being considered, in favour of sharing factors based on the BSF approach reflecting the confidence in the underlying information. A lowering of

these factors also implies that a significant information asymmetry remains. Hence, if the information advantage is reduced, e.g. if one relies less on companies for cost forecasts, there will be less need for lowering the sharing factors.

On the output delivery incentives (ODI). The use of targeted incentives should be limited to areas where performance improvement is crucial, and other benefits of the incentive mechanism justify the potential efficiency loss from this. This is because targeted incentives in selected outputs are not economically efficient as they divide the company's efforts into different activity areas that are incentivised separately.

The Return Adjustment Mechanism (RAM)**,** is suggested to mainly be an instrument of last resort. If other incentive mechanisms are effective and well-calibrated, the need for RAM should be significantly reduced.

Additionally, he delineates that the drive of companies may become more short-termist, given the difficulty in devising effective incentive mechanisms, shorter price controls, and less profit from Totex. However, as the companies may shift toward Opex saving as a source of profit, RIIO does not distinguish between Opex and Capex (Operating or Capital Expenditures). Hence, this may influence short term vs. long term efficiency- enhancing efforts of companies.

Finally, because the network sector has been difficult to incentivise to adopt new technologies, adopt and experiment, the role of Capex in long-term efficiency improvement and innovation is stressed. This suggests that parts of the solution to more innovation may lie beyond regulatory means in an economy-wide effort.

References:

Jamasb, T. (2020). Incentive Regulation of Electricity and Gas Networks in the UK: From RIIO-1 to RIIO-2, CSEI Working Paper 2020-01, CBS Department of Economics,

Appendix 1: Main differences from RIIO-1 and the planned RIIO-2

Incentive mechanism	RIIO-1	RIIO-2	Rationale for change/Possible Impact:
Length of price control	8 years	5 years	Rationale: Reduces risk of setting too high/low allowances ex-ante due to asymmetry of information. Possible impact: Might impact expenditure on innovation as shorter time period to recover cost of any investment.
Totex incentive mechanisms	Information Quality Incentive (IQI) - consisting of an upfront penalty/reward.	None.	Rationale: incentive did not operate as intended possibly due to assumptions on which it is based not holding in reality.
	Sharing factors (ranged from 47- 70%) - each company received a different sharing factor determined by the IQI.	Blended sharing factor (15-50%) derived as average of sharing factors assigned to different cost categories based on historical cost information.	Rationale: from initial analysis it does not appear to be a relationship between sharing factors and how much companies underspent the Totex allowances in RIIO- 1. It is therefore harder to justify a higher sharing factor.
Incentive on business plans	Fast-tracking – early settlement of the price control. Companies received the highest sharing factor available (without going through the IQI process). An additional upfront reward equivalent of 2.5% of Totex.	Business plan Incentive- upfront reward/penalty equivalent to a maximum of +/-2% of Totex with competed pot of money.	Rationale: provide companies with an additional incentive to reward effort for ambitious service quality and cost targets. Also intended as reward for specific information that might be revealed and used for other companies in the same sector (e.g., better

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			understanding of risks, uncertainty, particularly those that do not go in favour of regulated companies). Possible impact: from feedback received from companies, proposed size of reward might not be enough to incentive participation and effort.
Output delivery incentives	Targets and incentives for different output set ex-ante for the entire RIIO period.	Dynamic approach to setting targets and incentives, which might change throughout the RIIO-2 period depending on relative performance.	Rationale: Targets were achieved early in RIIO-1. Proposal for RIIO-2 removes risks associated with setting outputs at a low level by maintaining flexibility to increase targets for these outputs over time.
Innovation	Innovation stimulus provided as part of the price control through 3 mechanisms: 1. Annual Innovation Competition- worth ≈£500m over RIIO 2. Network Innovation Allowance awarded to each company (0.5- 0.7% of each company's allowed revenues ≈£500m over RIIO. 3. Innovation Roll-out mechanism – funding to enable transition of innovation into business as usual.	Reform the Network Innovation Allowance (NIA): Focusing mainly on projects related to longer-term energy system transition and addressing consumer vulnerability. Improving public reporting of projects funded, including costs and benefits, and demonstrating that successful innovation is diffused across the sector. Instead of automatic allowances linked to revenue, innovation allowances would be set based on justification set out in company Business Plan submissions. Replace (a) with a new pot focussed on major strategic innovation challenges and open to third parties.	Rationale: Evidence that (2) has been used to finance O&M works which should have been funded through the Totex allowance. Funding for major strategic challenges. Ensure additionality of new projects. Possible impact: More operational and maintenance works funded by Totex for innovations close to transition into BAU. Might reduce scope for innovation at early stage of development. Complexity of governance of new form of (a) might reduce scope for innovation at early stage. Difficult to track benefits achieved from these types of projects.
Allowance for cost of equity	6-7% (RPI real terms, 7-8% CPIH real equivalent).	4-5.6% (CPIH real terms).	Rationale: Align allowed cost of equity with risk faced by regulated network companies and to account for expectations of outperformance due to asymmetric of information. Possible impact: Likely to reduce overall return on regulated equity but it might affect cost capital in future.
Asset resilience	Some measures included in RIIO- 1.	Enhancement of previous measures to further constrain companies' ability to cut expenditure on asset maintenance.	Rationale: To ensure that the long-term value to consumers is better reflected in companies' business plan and that they are held to account for delivery.
Return adjustment mechanisms	None.	Considering company specific sculpting for ET, GT and GD if return deviate ±3%.	Rationale: protect consumers against excessive returns resulting from information asymmetry faced by regulator in setting revenues. Protecting investors from downside risk. Possible impact: Might distort companies' incentives in terms of efforts to achieve higher return and affect Totex submission.