

## **National Grid Electricity Transmission thoughts on a whole system incentive for the SO:TO interface for the RIIO-T2 price control**

This note summarises our thoughts on the potential role that one or more incentives could play in achieving better whole system optimisation in the RIIO-T2 price control at the interface between the Electricity System Operator (ESO) and the Transmission Owners (TOs) in Great Britain. The purpose of the note is to stimulate debate and to collect stakeholders' views on our thoughts.

To fully optimise behaviour at the interface between the ESO and the TOs we need to consider incentives for the ESO as well. Our note focuses on the activities that are under TO control because we are a transmission owner and we want to stimulate a debate about the incentives that should apply to us as a first step.

We explain below the need for increasing collaboration between network companies as the energy system changes. We also explain the opportunity to drive proactive innovation and improvement in the way TOs carry out their activities to assist the ESO in balancing the system and seek the lowest overall cost for consumers. We suggest some ways in which TOs could be incentivised to help deliver these lower whole system costs for consumers.

### **The need for increased collaboration in a changing energy landscape**

The energy landscape is undergoing a period of significant and rapid change as it moves away from a historical reliance on large, centralised thermal power generation and price-insensitive consumption towards a greater diversity of supply and flexibility of demand than ever before. The current trends, of more distributed generation, more variability of supply, more interconnection with Europe, growth in electric vehicles and more flexible demand are expected to continue into the RIIO-T2 period.

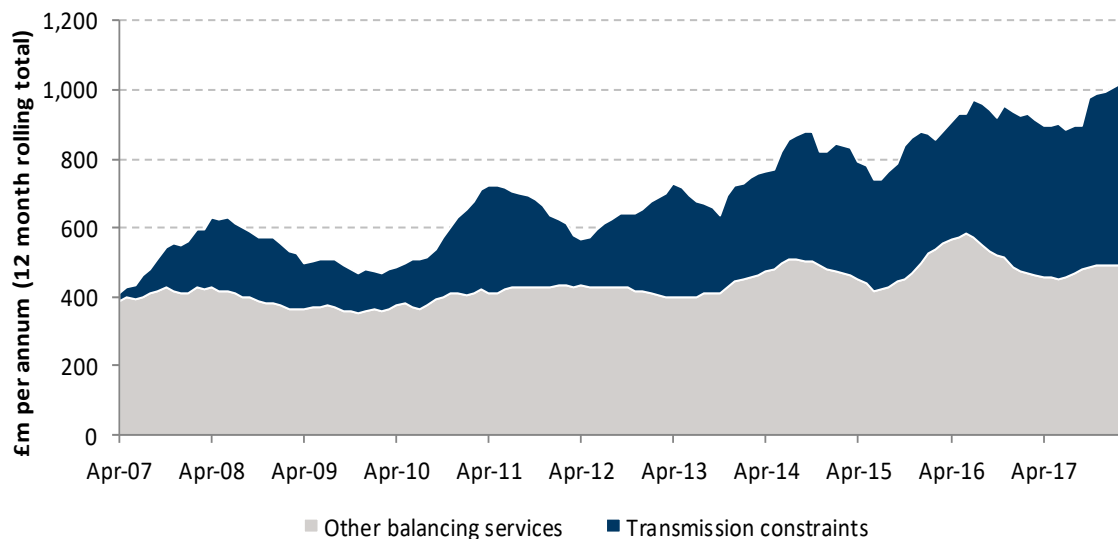
These changes require a step-change in collaboration and innovation across the whole energy system to enable the right amount and type of energy to be delivered where and when it is needed while maintaining a safe, secure and affordable system for existing and future consumers.

In this context, we have been developing our thinking on whole system outcomes by collecting views from a wide range of stakeholders and through multiple channels (e.g. open consultation, bilaterals and workshops). We have shared our developing analysis with our stakeholders, for example, through webinars, blogs, workshops and presenting at Ofgem Working Groups. Whilst there are many possible definitions of 'whole system' we have considered the issues that exist at interfaces that may lead to sub-optimal outcomes. There are a number of interfaces in the energy system. This note focuses on the TO side of the interface between the ESO and the TOs in Great Britain in relation to the management of 'System access' i.e. when asset owners take circuits and equipment out of service to enable necessary maintenance and construction activities to take place.

## Why does the SO-TO interface require our attention?

Network planning and system operation remain highly interlinked. In planning, operating and delivering activities efficiently there is a constant tension between facilitating network investment (the cost of delivering long term capability and reliability) and short term service performance (secure and cost effective system operation in real time). Both of these sets of costs are ultimately paid for by consumers. Effective coordination between the SO and TO is important to ensure the most efficient outcomes of the whole energy system for consumers.

The diagram below shows that constraint costs<sup>1</sup>, which are a cost for consumers, are on an increasing trend.



There will always be a level of efficient constraints on a network (to avoid overinvestment in capacity), but the changing energy system is creating a need for more flexibility in how the network is used with implications for the management of system access.

To help address these issues the TOs have introduced the Network Access Policy (NAP) during RIIO T1, building on the established procedures defined in the System Operator Transmission Owner Code (STC). The STC sets minimum standards and the NAP relates to additional services beyond them. The STC allows for the reimbursement of a TO's costs incurred if the system operator asks it to change its work delivery (where that option exists). These documents have improved SO:TO collaboration.

However, the existing NAP and STC arrangements on their own do not financially incentivise licensees to innovate to seek new and improved ways of working to improve whole system outcomes. Some tentative evidence of this is that in 2017/18 the combined TOs' cost reimbursement via the STC was around £500k. This amount represents less than 0.5% of total constraint costs over the same period suggesting that there might be further opportunities for TOs to innovate to help

<sup>1</sup> Data taken from ESO Monthly balancing services summaries (MBSS).

reduce constraint costs and hence reduce overall whole system costs for consumers.

TOs being more flexible in designing maintenance and construction activities, planning, contracting and working practices can bring additional benefits for consumers e.g. a TO could change the planning and execution of its work to offer shorter than 'standard' Emergency Return to Service times to help avoid potential constraint costs if they look likely to arise, although this will increase the TO's costs. The existing regulatory framework encourages TOs to reduce the cost of delivering their outputs, which is unlikely to drive TOs to provide flexibility to the ESO in either work planning timescales or in real-time operation to reduce the ESO's costs.

Simultaneously the ESO may well be encouraged by its regulatory framework to be less likely to grant TOs' system access requirements well in advance of the real time. This is because the ESO will be facing s inherent uncertainty about its potential operational risks and costs. The ESO granting lower levels of access could in turn cause additional costs for TOs, a share of which would be passed onto consumers.

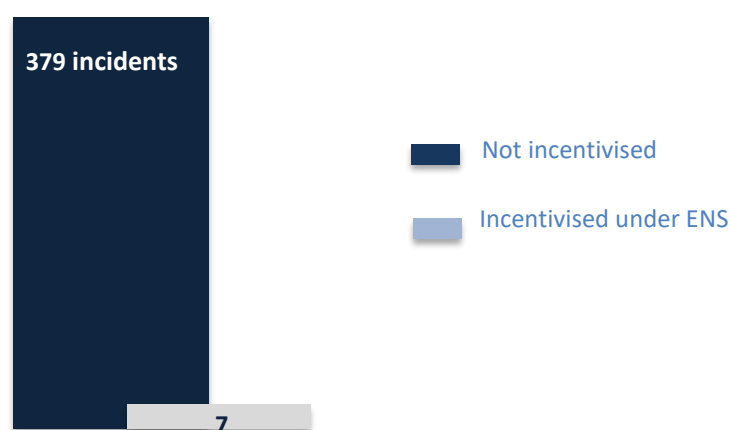
For both the ESO and the TOs, it is clear that continued coordination is necessary. The introduction of new regulatory incentives for RIIO-T2 has the potential to drive TOs to be proactive and innovative to seek to find whole system outcomes. This would unlock further value for consumers through the TOs and ESO delivering at lower overall cost to consumers.

### Potential areas where we could incentivise the SO:TO interface

We have identified the following main areas across the SO:TO interface where we could realise further efficiencies for consumers:

- **Minimising unplanned outages** – At present, the TOs have an incentive to avoid outages that cause Energy Not Supplied (ENS) that impact on their customers. However, as the diagram below shows only a small fraction of unplanned outages result in energy not supplied.

Number of Transmission incidents



Unavailability of a circuit, even when there is no direct customer impact in terms of energy not supplied, can lead to an increase in constraint costs<sup>2</sup>. In 2017/18 constraint costs, due to unplanned outages reached £36m. TOs could be incentivised to reduce the occurrence of unplanned outages and for those that do occur to return the network to service promptly to help reduce constraint costs. By reducing the occurrence and duration of unplanned outages, the SO can balance the system at lower cost for consumers. In designing any such incentive, we would need to take account of the potential overlap with our Network Asset Risk Metrics (NARMs) targets.

- **Reducing the amount of system access TOs require** – Currently there are circa 8,000 outages per annum with approximately 15% of planned outages causing over £220m of constraint costs in a year. While transmission constraints cannot be completely avoided, reducing the amount of system access required to maintain and upgrade the network reduces the likelihood of higher ESO balancing costs, which are ultimately paid for by consumers.

Given the above consumer benefit, a new RIIO-T2 incentive could be developed to drive new ways of working for the delivery of maintenance tasks and capital works with the aim of reducing the amount of system access and reducing the overall cost for consumers (e.g. providing shorter Emergency Return to Service times, bundling work together and adopting different contracting strategies). Such an incentive would encourage TOs and their supply chain to change established ways of working and to develop more optionality in the way they request system access to achieve lowest overall costs.

It may be possible to target this behaviour to some degree. The ESO could determine higher value circuits and place different weighting on them. Alternatively, the ESO could focus on the most frequent TO work types that have the greatest requirement for system access required.

- **Getting more out of the existing network** - TOs could be incentivised to deliver enhanced network capability from existing assets when they are most needed, while maintaining reliability. Transmission assets can generally carry out relatively short breaches of nameplate rating, still within the safe operating zone, but this can reduce the life of the asset, increase opex and increase risk. To help avoid constraint costs TOs may be able to offer enhanced network capability that offers an alternative solution to the ESO, increasing competition in the provision of balancing tools and enabling the ESO to balance the system at lower cost for consumers.

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<sup>2</sup> It is important to note that only some unplanned outages have an impact on system operation costs.

- **Improved return / release of planned outages** – Planned network outages that overrun and late returning can cause knock on consequences to other system access requirements. This may increase costs to DNOs and other third parties directly connected to the transmission network. They could also cause higher costs of system operation as a re-optimisation of the system may be needed. There are many causes of outage overruns, some of which may not be controllable by TOs, but it may be possible to incentivise a reduction in the number or severity of outage overruns over time. There may also be an opportunity to incentivise TOs to offer timing flexibility of their system access requirements, to accommodate system needs at short notice, to help balance the system and reduce impacts on other parties.
- **Develop shorter Emergency Return to Service times** - for some network outages, the ESO may ask TOs to ensure plans are in place to be able to return equipment to service quickly should the need arise - Emergency Return to Service or ERTS. Shorter ERTS times generally reduce the ESO's exposure period to constraint costs in the event of a system or generation fault causing a constraint and therefore can reduce the overall cost to the consumer. Having an ERTS generally changes a TO's execution of the work activity and particularly in the case of construction activities can fundamentally change the nature of the job and significantly increase a TO's costs. An incentive could be designed to encourage TOs to develop and offer shorter than standard ERTS times to realise improvements to the cost and quality of balancing services. Achieving shorter ERTS times will require TOs to adopt different contracting strategies and plan actual work differently which can increase the overall cost of output delivery. To measure performance, we would need to develop baseline standards. For example, we could use the reduction in the Mega Volt Amp (MVA) days of capacity exposure - reducing an ERTS from 5 days to 3 days for a 500MVA circuit, equates to a 1000MVA reduction in capacity exposure.

### Seeking your views

This note summarises our thoughts on the opportunities to drive consumer benefits through improvements in whole system optimisation at the SO:TO interface. Your feedback is an important part in setting the direction of travel and moving forward the debate.

We welcome your views on our current thinking by email to

[jonathan.ashley@nationalgrid.com](mailto:jonathan.ashley@nationalgrid.com) or via our website

<http://yourenergyfuture.nationalgrid.com/electricity-transmission/> by 5 February 2019. We will collate your responses to this document and provide an update in March 2019.