Economic Consulting Associates
Viewpoint

Making the ESO concept work

April 2019

National Grid has legally separated out electricity system operation. In the press, this is hailed as the opportunity to make generation zero carbon - surely the separation was unnecessary for that. What is needed is the harder task of efficiency in the trade-off of investment in network against cost of congestion management. There was talk of Competitively Appointed Transmission Owners (CATOs), but several questions about this need to be explored. This viewpoint asks the questions: are there real benefits for the consumer from a more complex regulatory structure for transmission ownership and operation and how can these benefits be realised?

What is the current framework?

The SOs role is to demonstrate it assesses the network condition on an annual basis in a transparent and unbiased way. For this it has the Electricity Ten Year Statement (ETYS) and Network Options Assessment report (NOA). The focus is transparency with annual re-evaluation of projects based on the Future Energy Scenarios (FES) which are based on all stakeholders' views (although they seem to cater for prevailing opinions rather than just development intentions).

Bolted onto this is the Network Innovation Allowance (NIA) and the Network Innovation Competition (NIC). Only in the more recent publications of NOA has there been an effort to include 'commercial solutions'. In fact, distribution seems to be where a lot of the innovation potential lies in the future (smart grids, electric vehicles, storage, local operation etc.)

Ofgem has been keen for some time for CATOs to appear however the process has been delayed. One thing that has not changed is the definition of what a candidate project from NOA would look like that would open up for competition. Ofgem have yet to pick a trial project to go through the process although the NOA was set up to accommodate this a while back. One of the large nuclear connections was expected to be one of the first trial CATOs.

Ofgem launched an informal consultation on changes to Standard Licence Condition C274, proposing that the ESO assess projects recommended for further development in the NOA, for their eligibility for competition, and to undertake the same competition suitability assessments on future generator and demand connections to the transmission system. Ofgem is only beginning to consider what efficiency incentives are required.

Models for separation of system operation

The creation of the ESO is actually the culmination of an uneasy arrangement whereby National Grid was the GB System Operator (SO) and the Transmission Owner (TO) for England and Wales; the Scottish network companies were only TOs, always concerned that they would lose out on network investment opportunities at the Scottish border where network solutions that benefited National Grid (TO) may have been preferred. However, without commercial separation, there is a suspicion that the ESO will

favour its parent company by promoting network development (adding to the asset base) anyway. The System Operator Transmission Owner Code (STC) was developed as a new agreement to regulate relations between National Grid and the Scottish TOs – an increase in regulatory complexity.

Other network regulatory structures in play are:

- **OFTOs**. Offshore windfarms are connected to onshore by specialist licensed transmission companies that bid for the right to construct, operate and charge for the connection. These follow the construction and operation model of:
- **Interconnectors**. These are transmission lines that cross borders; in the GB framework, they are all merchant (but often TSO-owned).
- **Competitively bid networks**. These can be seen in network arrangements in the Americas. New lines are auctioned for development; in the US, often integrated utility companies can bid to propose and provide network solutions to a multi-State SO such as PJM. The CATO model has been devised a bit like this but only for discreet and clearly-defined separate assets.

Savings on construction cost is not the problem

All these models can operate with competitive procurement for construction leading to least cost investment but what is required is a method for determining what investment is needed; questions of regulatory incentives and efficiencies remain. Potential options are:

- **TO investment**. The TO makes its network development plan; approved investment enters its Regulatory Asset Base (RAB) – this offers little scope for the SO to more efficiently procure.
- **ESO development plan**. This is essentially the chosen model. The ESO seeks industry plans (developed from Future Energy Scenarios into 10-year Statements) and assesses a trade-off between the cost of congestion and network solutions on offer and then instructs the TO where and what to construct. There is no clear incentive on the ESO to pursue the trade-off between system operation cost and investment cost efficiently because the ESO revenue stream is inevitably small and so there is little the Regulator can use to leverage efficiencies.
- **ESO tenders for the assets from new network companies (CATOs)**. This is like the OFTO model, with new licensed operators carving out bits of the TO's territory.
- **Merchant CATO**. This is like the interconnector model with CATO revenue dependent on planning assets then selling access to them.

Making the CATO model work: risk

This has been much debated. The current OFTO arrangements on which it could be modelled do not particularly work well. OFTOs run licenced and price-controlled DC networks connecting specific offshore windfarms to the GB transmission network. This is not necessarily efficient because an offshore network connected onshore at fewer places may be a cheaper solution. Similarly, would the CATO lead to efficiencies in investment in the meshed onshore transmission network compared to the planned investments by a TO?

At source, the issue is about who takes the risk in deciding to invest. The TO (or the SO on the TO's behalf) will get pre-approval for an investment, which then goes into the RAB and earns a regulated return. Even if least-cost construction is

procured, this does not ensure the line is necessary or in the best place.

The merchant CATO model would put forecasting risk onto the CATO who would be reliant on network users bidding for access – but only if the TO was similarly made to auction access for its other lines. Without competitive bidding for access then users would seek to bypass the CATO assets in the meshed network. This starts to look complex. Even with interconnectors, merchant risk can be limited through the cap and floor regime that effectively underwrites interconnector revenue risk, blunting the efficiency incentive.

What about transmission tariffs?

While a CATO model could work for discrete connections (similar to the OFTO model), this doesn't fundamentally change the incentives for efficient planning of the meshed network. For a CATO model to be effective in improving investment decisions in the meshed part of the network, major changes in the transmission charging regime are needed. A CATO must face revenue risk related to whether its investment genuinely relieves congestion and, in turn, this means that it must either be rewarded based on flows using its assets that would otherwise have been constrained off or on its ability to lower system costs.

Various charging models can theoretically deliver this, such as flow-gate regimes, locational pricing with transmission rights contracts and auctioned point-to-point pathways. All would need to be system-wide, rather than limited to the CATO assets alone, to avoid free-riding by either CATO investors or by system users. However, all have in common that they would represent a major increase in complexity over current arrangements with potentially large transactions costs. The transitional process would also be difficult as suppliers and loads find themselves facing large changes in transmission costs relative to those on which they predicated their own investment decisions.

Also to be considered are how the residual costs of the system are recovered and the potential implications of such a model for the cost of new investments. Imposing this type of risk-based investment model sharpens incentives but also raises the costs of financing for CATOs which, in turn, will limit the pool of potential investors and raise the prices they require. The resulting efficiency gains would need to be very significant to offset these impacts.

Ambitious changes are needed before consumers see benefit

An ESO, by itself offers little; what is required is a change in the transactional arrangement and a reallocation of risk. Several models for this could be developed including auctioned access rights (which may include Financial Transmission Rights); CATOs and TOs need to face genuine risk if consumers are to benefit. But this comes at a cost in terms of complexity and required returns. In a world where distributed generation, demand-side response and storage are increasingly substituting for network investment and providing competitive pressures, is the cost of this additional risk worth it?

Economic Consulting Associates was established in 1997 to provide economic and regulatory consulting services to industry and government. Our senior staff have many years' experience of carrying out economic, market and policy analyses in the electricity, natural gas and water sectors.

Economic Consulting Associates

41 Lonsdale Road
London NW6 6RA
Tel: +44 (0) 20 7604 4546
www.eca-uk.com