What success might look like for Ofgem's targeted charging review

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1. Setting regulated tariffs is hard. Most regulatory reviews of methodologies fail to achieve their objectives. Could Ofgem's targeted charging review of residual charging and other embedded benefits break the spell of failure?

The problem

2. Ofgem is currently running a targeted charging review. The scope of Ofgem's targeted charging review is residual charging and other embedded benefits.

3. Ofgem defines residual charging as follows:

> [Forward-looking use of system charges] are the charges set by forward-looking cost models that provide signals to users about their use of the transmission and distributions networks. Residual charges 'top up' the revenues from forward-looking charges where necessary, to ensure the networks recover their allowed revenues.

4. Residual charges are a big deal: they represent most of transmission network use of system charges (TNUoS), all of balancing services use of system charges (BSUoS), and a variable and often large part of distribution use of system charges (DUoS).

5. For distribution, several major changes have been made to the allocation of so-called residual charges this decade.

   (a) In April 2010, the replacement of DNO-specific methodologies with the CDCM brought a degree of transparency and consistency to the charging arrangements for most customers (except large sites with site-specific tariffs).

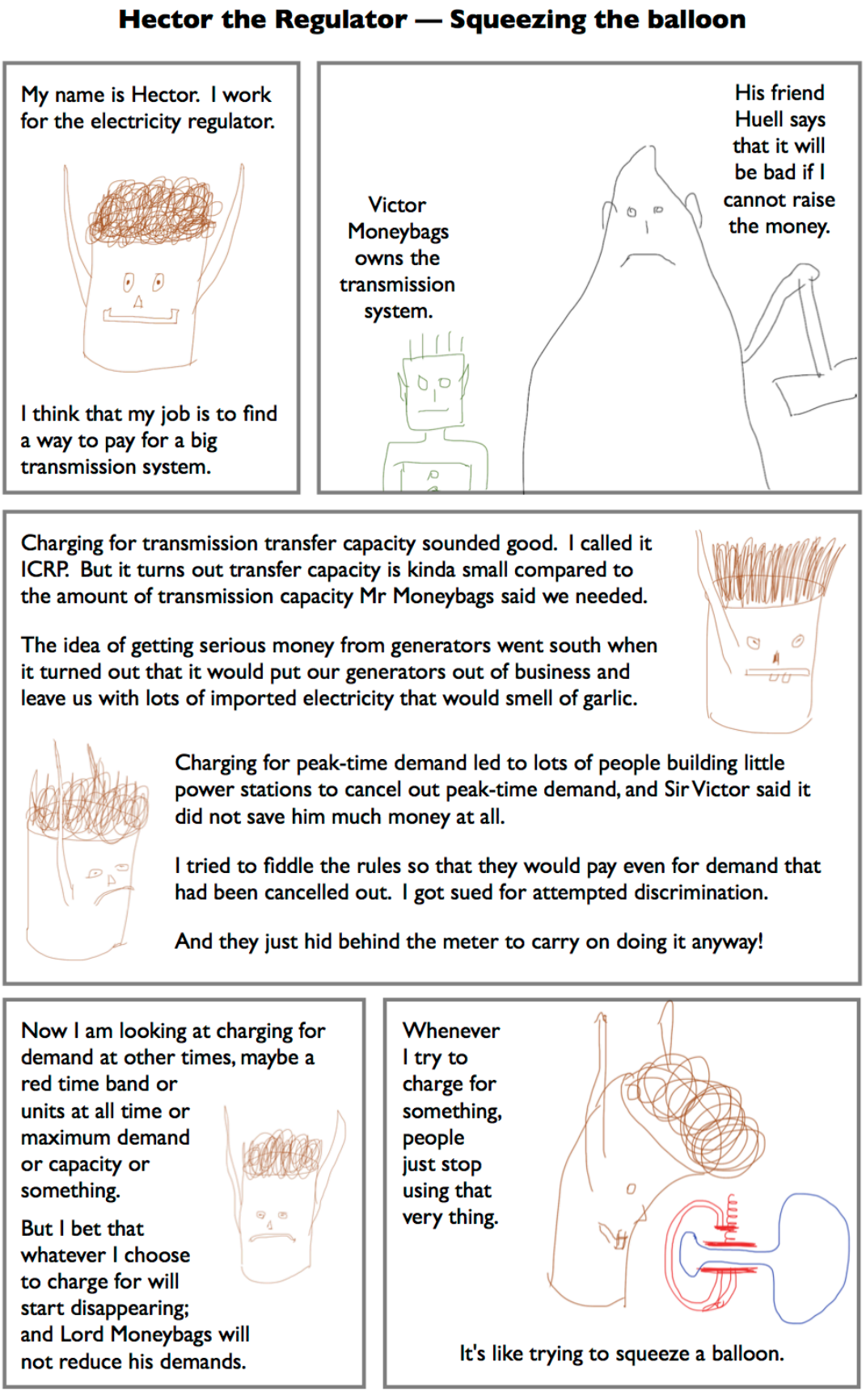
   (b) In April 2012, the introduction of the EDCM changed the basis of charges for large sites with site-specific tariffs, albeit in a way that failed to deliver much transparency.

   (c) In April 2018, a major change to the charging arrangements for most customers will come into effect, with the effect of dramatically increasing charges on users with high off-peak consumption (i.e. industrial users which have flat load profiles and/or have reconfigured their businesses to avoid peak-time consumption) and reducing charges for users with high peak-time consumption (i.e. domestic customers).

6. I keep a treasure trove of data on distribution tariffs at dcmf.co.uk/models/cdcm-core (except in respect of site-specific tariffs where the DNOs are not providing an adequate level of transparency).

7. For transmission, the history is even more convoluted. Figure 1 gives Hector the Regulator's perspective on what happened.

Figure 1 Squeezing the balloon, Hector the Regulator, http://dcmf.co.uk/hector



What good looks like

8. If Ofgem's review fails, it will be easy to spot the usual symptoms of failure:

   (a) Expert groups and task forces stuffed with representatives of incumbents protecting the parts of the status quo that suit them.

   (b) A scramble to come up with a mass of different charging options to be assessed, with no discernible link between the prices to be charged and the economic value of the services provided.

   (c) Economic impact assessments which focus on crystal-ball gazing about the quantitative impacts of changes in charges on market participants, market prices, carbon dioxide emissions and a nebulous notion of welfare.

   (d) A bias towards widening the charging base: smearing charges on as many people as possible in the hope that they won't notice their unfairness.

   (e) Passive acceptance of the revenue residual, with no analysis of the products and services that are being purchased with that money.

   (f) Any mention of Ramsey pricing or of chasing shifting peaks.

9. But what would success look like?

10. I think that, at first, success might appear to be messy too. To succeed, the review will need to disentangle who provides what service to whom in the industry, and recast charges to reflect these services. That will mean challenging some established conceptions and stepping on some toes.

11. For example, transmission network use of system charges are currently charged on generators and suppliers based on their entry/exit capacities or volumes. But that ignores the fact that an important service provided by transmission system infrastructure is the ability to share reserve/response capacity across the country, and the amount of transmission capacity provided for that purpose is driven by system operation rules and needs, not by bulk movements of power.

12. At the extreme, an interconnection provided for mutual support between two areas which both have a broad balance of generation and demand will cost money to finance, build and maintain, and will provide benefits to system users in both regions. But it would not be picked up in the ICRP model.

13. A proper analysis of the services would therefore identify three categories of demand for transmission capacity: generators, suppliers, and the system operator. At this point one would ask whether there is still a residual between the revenue from cost-based charges to these three categories of users and the maximum revenue allowed under the price control. If yes, some other service probably has yet to be discovered, or there might be stranded cost included in the price control which should not have been.

14. I can hear some muttering at the back of the room:

    (a) It's all just smoke and mirrors.

    (b) Customers will end up paying for these costs anyway.

    (c) All I have done is shift a pot of non-cost-justified TNUoS charges into the equally non-cost-justified BSUoS pot.

15. Yes, sir, that is a fair complaint. I still need to recast BSUoS charges to match services provided by the system operator before I can claim victory.

16. So what does a system operator do? It does not balance generation and consumption — the laws of physics do that. In cases where the system operator happens to be in charge of switching, as is currently the case in England, Wales and Scotland, then it might be responsible for configuring the system to be safe, stable and robust to faults, but that operational job on its own would not cost hundreds of millions of pounds a year.

17. The meat of the system operator business is the economic provision of reserve on a shared, or pooled, basis. When there was no National Grid and no system operator, each local or regional system had to have its own reserve arrangements, in the form of interruptible demand, part-loaded or standby generators, and/or storage, which would be triggered in the event of a generating set failure. That was a lot of reserve to hold on aggregate.

18. The economic benefit of interconnection is that only a fraction of the reserve needs to be maintained, because if there is a decent transmission system then interruptible demand, flexible generation or storage anywhere in the country can respond to a generating set failure anywhere in the country. To achieve these economic benefits, the system operator needs to:

    (a) Commission and/or reserve an appropriate amount of transmission capacity from transmission asset owners, as per my comments above.

    (b) Procure and/or instruct providers of reserve, e.g. by compensating generation plant for being instructed out of merit in order to create part-loaded generating sets, in a way broadly similar to what is currently done using BSUoS money.

19. Across England, Wales and Scotland, each of these bullet points will cost hundreds of millions of pounds a year. So who should be paying for that?

20. The industry's current answer for the second bullet point, a flat BSUoS p/kWh charge that applies only to electricity that was generated by large generators, has no logical basis for a system operator charge for the provision of reserve (whereas that charging basis could have had some basis as a transmission charge since it very approximately captures electricity that passes through the transmission system). It gives a sizeable benefit to small and medium distribution generation, again without reason. It is not a serious contender for a good solution.

21. A successful review will be one that goes back to basic commercial analysis, instead of scrambling in the dark for an economic charging methodology that would not lead to too much visible distortion.

22. Here, the usual regulatory tool of asking who causes the costs fails. Each individual 1GW generating set causes reserve to be held against the risk of a 1GW sudden in-feed loss, but only if there is not another 1GW generating set on the system. So the incremental cost attributable to one customer is either zero or the entire cost, depending on the choice of counterfactual. It's a beautifully pure joint cost.

23. But a down-to-Earth business analysis of this pricing question does not find this problem particularly hard. What can the system operator charge for reserve/response services to cover the costs of transmission infrastructure and the payments for procuring and instructing balancing services? Answer is no more than the cost of the alternative to interconnection, i.e. the cost of maintaining your own local reserve capability, be it through explicit procurement of reserve services or through the occasional imposition of involuntary demand control on customers.

24. Provided that transmission capacity is not extortionately priced and that the system operator is not really bad at his job, that cap on charges will be a hell of a lot more on aggregate than the system operator's revenue target, because it costs less to procure 1–2GW of reserve/response and a transmission system to share it around than to have each large power station procure its own 1–2GW of reserve/response. In other words, there are benefits of interconnection. Great, the system operator business model looks viable!

25. The job of the system operator's pricing department is to share these benefits across its users. Remember, life is nicer if you are Father Christmas than if you are playing tax collector or balloon squeezer.

26. Father Christmas still has to pay attention to fairness, non-discrimination, and not making promises he cannot keep. I am not going to predict the entire review in this article, but here are some ideas:

    (a) The basic concept should be scaling down from modelled costs. In this case, the modelled costs are the costs of alternative ways of providing response/reserve in the absence of system interconnection. These modelled costs should be scaled down to match target system operator revenue in order to set the response/reserve charge. There is no symmetry here. Scaling up (charging more than modelled cost so as to collect a revenue allowance) is evil and a form of monopoly abuse, but scaling down (charging only a proportion of modelled cost so as to stay within allowed revenue) is a good, generous and non-discriminatory way of sharing benefits.

    (b) Simple is good, but simplistic would be bad. I think that it is right that large generating sets should provide the best part of system operator costs on the basis that they are the users of reserve/response against a large in-feed loss and that it would cost them a lot more to provide that reserve/response themselves instead of sharing it across the interconnected system. But Father Christmas should resist the temptation to stop thinking once he has found that he can get all his

revenue form large generating sets. Large generating sets might be a dying technology, and perhaps in the not-so-distant future the services procured by the system operator will be focused on something else that the largest in-feed loss. It would not be prudent to carry on providing system operator services to all other categories of system users without identifying these services, measuring them and being ready to charge for them (even if the charging rate is set to zero initially). So there needs to be some work on defining all the services and benefits that interconnection and an active system operator provide.

(c) Cost causation is not totally irrelevant. For example, if Hinkley Point C and other new large generating units are built, total system costs might be higher to cover the existence of a larger plausible in-feed loss than from the existing fleet of generating units. The system is currently planned on the basis that the largest in-feed loss risk is 1,320MW, but some new nuclear generator designs use larger reactors which could pose a loss of in-feed risk of up to 1,800MW. To ensure that existing generators are not being made to pay for reserve that they do not use or want, a degree of tiering of the in-feed loss reserve/response charge might be necessary, so that a different scaling-down factor would apply to the cost of each MW of response/reserve provided above the traditional 1,320MW standard.

27. So now we are not dealing with just smoke and mirrors. I am proposing taking many hundreds of millions of pounds out of triad charges and BSUoS charges, and recovering most of that money from large generating sets, through a charge that would be based on scheduled hours of operation of generating sets with a large in-feed loss risk. And I am foreseeing applying a higher charging rate for generators with a in-feed loss risk above 1,320MW. These would be real market changes and would step on some toes.

28. If you believe the nuclear-sponsored press, you probably think that my vision of charging most system services to centrally-despatched non-intermittent generators is lunatic. You might argue that I am missing the costs imposed by the intermittency of solar and wind generation. You might point out that the solution outlined above would contain something similar to substantial embedded benefits for diesel farms (who would not be liable for the in-feed loss response/reserve charge).

29. Maybe so. Or maybe not. My aim today is not to argue over these points. It is merely to identify that the question of identifying and sharing out the benefits of system interconnection will be at the core of a successful targeted charging review, and whilst bickering about who is to blame for what category of cost and who has the broadest shoulders to bear unanalysed costs would be the sign of a failing one.

30. The targeted charging review could yet work, if it refocuses away from the miserly task of hunting people to pay for shared system services, and towards the glorious and generous endeavour of handing out the financial spoils of interconnection and reserve/response sharing.

31. Stop asking what drives system costs. Ask what are the benefits of interconnection.

What this means in practice

32. If your business is affected by the targeted charging review, it might be prudent for you to take a step back from the day-to-day business of optimising your charge avoidance systems and/or your revenue stack, and identify the true benefits that you get from being part of an interconnected electricity system and how much you are willing to pay for them, and the true services that you provide and what alternative solutions are available to the beneficiaries of your services.

33. It's not rocket science, in fact it's strategic business model analysis 101. The only twist is that you need to abstract from the current industry contractual and regulatory shambles when conducting that analysis, because the current form of that shambles is not sustainable.

34. Armed with that understanding, you will be able to hold the intellectual high ground in forums and working groups, and maybe — just maybe — you'll be the one that turns the review into a success, and converts the shambles into a respectable industry charging structure that reflects business fundamentals.

35. But what if the current shambles just morphs into a different shambles with different, but equally big, disjoints between charges and services? After all, this is arguably what has happened in every previous review. Let's be honest, even if the current form of the shambles is not sustainable, the fact that it is a shambles might well be sustained.

36. But even in that failure scenario, your strategic analysis would have put you in an excellent position to understand the discrepancies in the new shambles and to exploit them to your advantage.

Shameless plug

37. Do you need help from a sad geek who understands how the present shambles works, but would love to have that knowledge made redundant by a move to something saner? You should hire me because I am hopeless at squeezing balloons, but good at stepping on toes.