3 December 2019

A REVIEW OF BRINGING ENERGY HOME

The cost of breaking up Britain's energy networks

Frontier Economics has previously been commissioned by the Energy Networks Association (ENA) to provide our independent views on aspects of a recently issued policy paper, Bringing Energy Home (BEH).[1]

In our first paper on this topic[2], we were asked to consider whether the policies set out in BEH would more efficiently meet their stated objectives than the existing ownership and governance arrangements for energy networks. Our main conclusion was that the balance of evidence strongly suggested that the set of policies within BEH carried a significant risk of increasing the cost, and delaying the delivery, of a range of desired policy outcomes, including the transition to net zero.

One of the points that led us to draw this conclusion was the geographic fragmentation of the energy networks that would be permitted under BEH's policies. Over time, this would lead to higher cost to serve.

- This is because under BEH cities, boroughs and even individual streets or housing estates would have the right to break away from their existing network provider (the resident Regional Energy Agency (REA), each based on the existing 14 DNO regions) to set up their own provider, a so-called Municipal Energy Agencies (MEA) or Local Energy Communities (LEC).
- As each MEA or LEC splits off from the resident REA, scale is lost, as new, small companies are created and the size of the original REA is eroded.
- Since there are strong scale economies in the operation of energy networks, something for which there is compelling academic evidence (as we documented in our first report), loss of scale can be expected to lead to lower levels of efficiency and hence higher cost to serve.

The question then is by how much could costs, and bills, be expected to rise?

We have already provided a concrete example of the likely quantum of this increase in our first report, by analysing the likely consequence of Leeds splitting off from the Yorkshire distribution region. In this follow-up paper we extend our analysis of the inefficiency that will be likely to arise as a result of geographic fragmentation, by analysing what would happen if the option to establish an MEA was taken up by just one city in each existing DNO regions.

1 "Bringing Energy Home, Labour's proposals for publicly owned energy networks", Labour 2019 https://www.labour.org.uk/wp-content/uploads/2019/03/Bringing-Energy-Home-2019.pdf

2 "A review of Bringing Energy Home", Frontier Economics, September 2019, http://www.energynetworks.org/assets/files/news/Frontier%20-%20A%20Review%20of%20Bringing%20Energy%20Home%20FINAL.pdf

Results

The changes proposed under BEH would make our energy system more geographically fragmented and less efficient, meaning more money will have to be spent to get the same levels of performance that we have now. This inefficiency will need to be funded by billpayers or the taxpayer.

Below we show the estimated annual increase in costs to the billpayer in each year once the full effect washes through to bills. As a result of geographic fragmentation alone, assuming the creation of new MEAs as set out in the table below, long run cost to serve could increase by between 5.1% to 14.7%. Domestic distribution bills across GB may increase by between £9 and £25 in the long run, leading to higher costs of between £253m and £714m in aggregate[3]. Dependent on the detail of how bills would be calculated under state ownership, this impact could increase bills in the short term.

Figure 1 Estimated long run bill increase from geographic fragmentation

Statistical/DNO region	Selected urban area within region	Minimum increase (%)	Maximum increase (%)	Minimum bill increase	Maximum bill increase
North West England / Electricity North West	Manchester	5.5%	15.6%	£8	£23
North East England / Northern Powergrid Northern	Tyneside	8.8%	23.1%	£22	£58
Yorkshire / Northern Powergrid Yorkshire	Leeds	6.6%	18.0%	£17	£46
East Midlands / WPD East Midlands	Leicester	3.6%	11.1%	£5	£14
West Midlands / WPD West Midlands	Birmingham	7.7%	20.5%	£14	£36
South Wales / WPD South Wales	Cardiff	8.0%	21.1%	£13	£35
South West England / WPD South West	Bristol	6.3%	17.5%	£12	£33
London / UKPN London Power Networks	Kensington	4.0%	11.9%	£6	£19
South East England / UKPN South Eastern Power Networks	Brighton	3.4%	10.4%	£6	£19
East England / UKPN Eastern Power Networks	Norwich	3.2%	10.0%	£6	£18
South Scotland / SP Distribution	Edinburgh	6.0%	16.7%	£10	£27
North Wales, Merseyside and Cheshire / SP Manweb	Liverpool	6.3%	17.5%	£7	£21
North Scotland / SSE Scottish Hydro	Inverness	6.2%	17.1%	£16	£43
Southern England / SSE Southern	Portsmouth	2.2%	7.2%	£3	£10
Average total cost increase across all regions		**5.1%**	**14.7%**	**£9**	**£25**

Source: Frontier Economics analysis, based on ONS population data and a range of academic evidence. See methodological notes below.

Note: Statistical data is not produced by DNO region. Therefore, the size of DNO regions are estimated, and we therefore consider the size of the impact to be indicative rather than definitive.

[3] Assuming 28 million electricity meter points, https://www.ofgem.gov.uk/publications-and-updates/record-number-customers-small-and-medium-sized-suppliers

Methodological notes

We rely on the same method that we used in our first report to provide an estimate of the effect of geographic fragmentation.

- For simplicity, we use population within a given region as a proxy for network size.
  - We have gathered data for each DNO region from the ONS.
    - Note that the statistical regions used by the ONS do not precisely match the 14 DNO service regions, but can provide a reasonably close approximation.
  - We also gather population data for our selected urban areas, also from the ONS.
    - It is worth noting that had we selected other urban areas, then we would derive different results for the bill impact. This is noted, but we consider our analysis to be representative of a plausible future scenario under BEH.
- To quantify how lost scale may increase cost, we use the scale economy estimates found in academic work for energy networks.
  - As we set out in our first report, the scale economies found in the academic literature range between 0.669 and 0.861.
  - To understand how to interpret these figures, a scale elasticity of 0.7 would imply that for each 1% increase in all network outputs, costs would increase by only 0.7%. Hence, all other things equal, a larger entity will have lower costs per unit or per customer than a smaller company.
- In each region we can then estimate the effect on aggregate cost to serve arising from splitting the REA into an MEA and a smaller remaining REA service area.
- Finally, to make our estimates more readily interpretable, we derive the long run effect on bills arising from lost scale economics.
  - We have estimated the level of the current distribution bill for domestic customers by region.
  - We use the charges for Domestic Unrestricted customers (Profile Class 1) as set out in each of the 14 licenced regions 2018-19 statement of charges.
  - We apply these charges to Ofgem's estimate of annual mean electricity consumption for Profile Class 1.[4]
  - We then estimate bill increases as set out above.
- All averages are population weighted.
- Note that if existing charging structures were retained under BEH, then the full effect of geographic fragmentation would take some time to work through into

[4] See https://www.ofgem.gov.uk/system/files/docs/2019/10/tdcvs_2019_open_letter_0.pdf. Table on page 9 of the document.

bills, owing to the way costs are capitalised into the RAV and then paid down by customers over time.

- We note that charging structures may change under BEH and it is therefore possible that bills could reflect lost scale economies in the short term.

We note that it is not possible to know the extent to which MEAs and LECs would be established in practice should the policies within BEH be implemented and as a result, our analysis can only be considered one of many possible future scenarios. But given the prominence placed on MEAs and LECs within BEH, uptake of the level assumed in this paper seems plausible at the very least.