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SUBMISSION TO OFGEM

# CONSULTATION ON FRAMEWORKS FOR FUTURE SYSTEMS AND NETWORK REGULATION

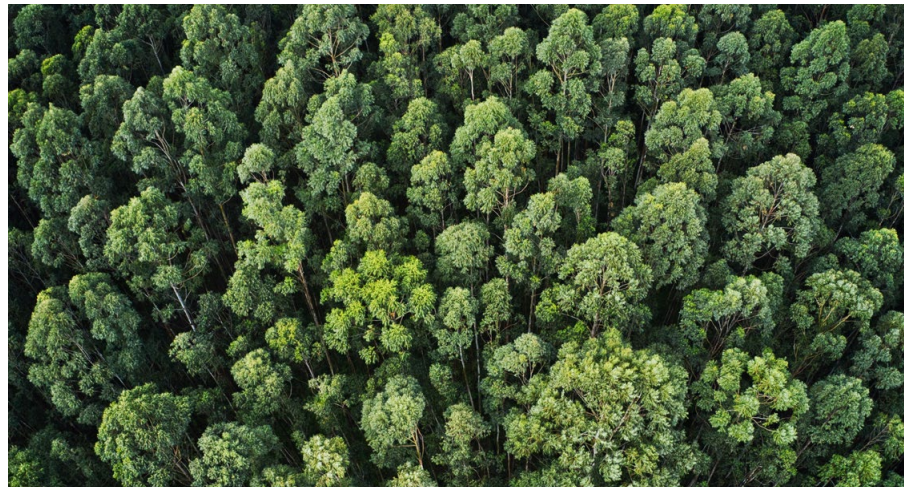
ECONOMIC INSIGHT'S RESPONSE

This paper sets out Economic Insight's response to Ofgem's consultation on frameworks for future systems and network regulation. Rather than provide question by question responses, we focus on certain key issues that arise relating to:

- (i) the strategic need for change;
- (ii) the relative balance between Ofgem's proposed archetypes; and
- (iii) designing future network regulation (migrating from natural gas to hydrogen).

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# 1. Strategic case for change: the urgent need to address low productivity across the UK economy

Chapter 2 of Ofgem’s consultation document rightly emphasises the wide-ranging implications of the UK’s drive to achieve net zero by 2050; and the associated acceleration of decarbonisation across the energy system. Amongst other things, the regulator highlights that this will require:

- levels of investment unprecedented since privatisation (including the need to meet peak electricity demand up to three times the current level)<sup>1</sup>;
- a material change in the energy supply mix<sup>2</sup>;
- substantial changes to the geography of generation<sup>3</sup>; and
- a need to manage the decline of natural gas<sup>4</sup>.

In addition to the above, however, in our view the appropriate systems and regulatory framework for the future should also place the urgent need to address the UK’s wider low investment, low productivity stasis front and centre. This is because infrastructure industries, including energy networks, have the potential to play a critical role in helping navigate a path forward for the economy, as we explain below.

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1. ‘Consultation on frameworks for future systems and network regulation: enabling an energy system for the future.’ Ofgem (March 2023); paragraph 2.3.

2. ‘Consultation on frameworks for future systems and network regulation: enabling an energy system for the future.’ Ofgem (March 2023); paragraph 2.2.

3. ‘Consultation on frameworks for future systems and network regulation: enabling an energy system for the future.’ Ofgem (March 2023); paragraph 2.2.

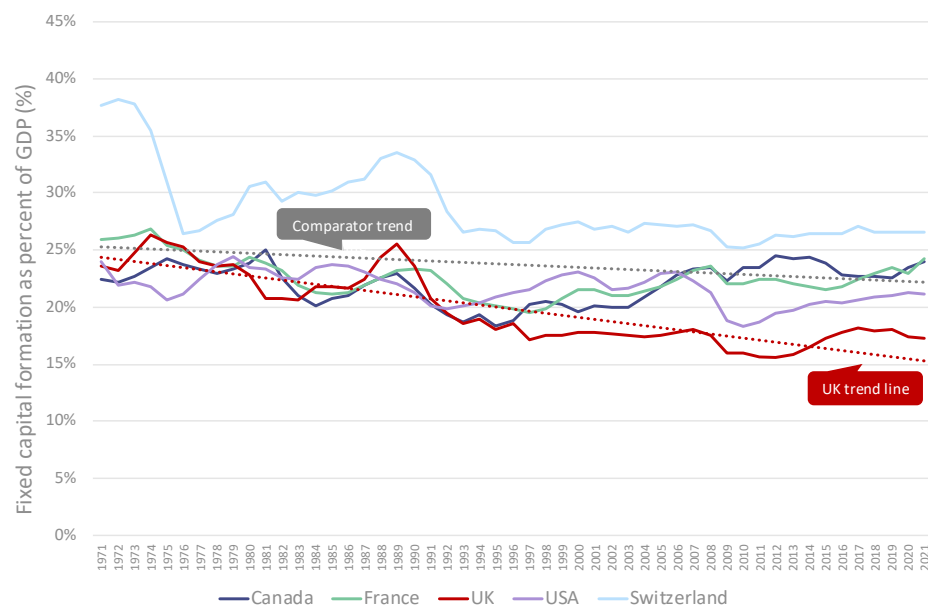
4. ‘Consultation on frameworks for future systems and network regulation: enabling an energy system for the future.’ Ofgem (March 2023); paragraph 2.4.

## 1A. Low investment is a long-running story in the UK

In terms of understanding the UK’s relative position on investment, and infrastructure investment specifically, there are an array of potential metrics that can sometimes make it difficult to reach a clear conclusion regarding our relative position. Notwithstanding this, and as noted in the House of Commons Infrastructure policies and investment report (2021), “there is broad consensus that over the past 40 years the UK has underinvested in infrastructure.”<sup>5</sup>

In 2015, the OECD published a detailed analysis of infrastructure in the UK. It found that: “the United Kingdom (UK) has spent less on infrastructure compared to other OECD countries over the past three decades.”<sup>6</sup> This view was, in part, informed by a comparative analysis of the UK’s ratio of fixed capital formation to GDP over time, where the OECD drew comparison with Canada; France; the USA; and Switzerland. We have updated this analysis, up to and including 2021, the results of which are shown in Figure 1.

Figure 1: Fixed capital formation as a percentage of GDP



Source: Economic Insight analysis of OECD data

5. ‘Infrastructure policies and investment: House of Commons Briefing Paper.’ (2021).

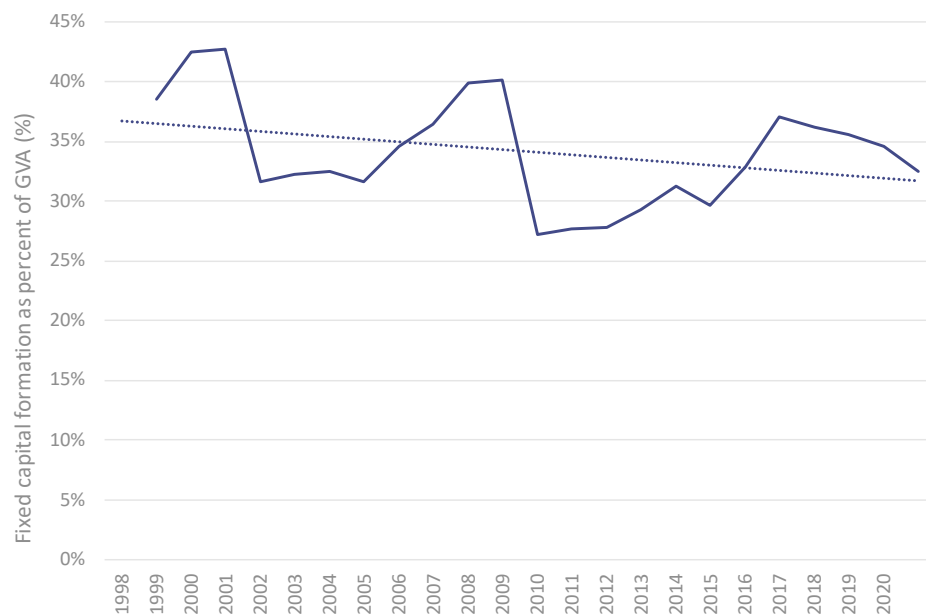
6. ‘Improving Infrastructure in the United Kingdom.’ OECD Economics Working Papers No. 1244 (2015); page 8.

As can be seen, the UK has continued to invest less than the comparators used by the OECD. Over the period, the UK’s ratio of fixed capital formation to GDP has been <20%. For the comparators, the average is 24%. In addition, as can be seen from the dotted red line in the figure, this ratio has been trending down starkly for the UK. Whilst the capital formation ratio has also trended down for the comparators (see the dotted grey line) this has been less pronounced. In other words, not only has the UK invested less than the comparators on average over time, *the difference has been increasing*.

### 1B. Investment as a proportion of value has trended down in regulated network industries

It is difficult to accurately compare investment specifically in energy (and other regulated network infrastructure industries) across countries. However, the ONS publishes data on fixed capital formation by SIC code. Using this, we have analysed the trend in the same ratio as reported above for the UK as a whole, focusing on the energy and water industries (i.e. fixed capital formation to GVA). The results of this are shown in Figure 2. Again, a downward trend at the industry level can be observed over time.

Figure 2: Fixed capital formation as a percentage of GVA – energy and water sectors combined



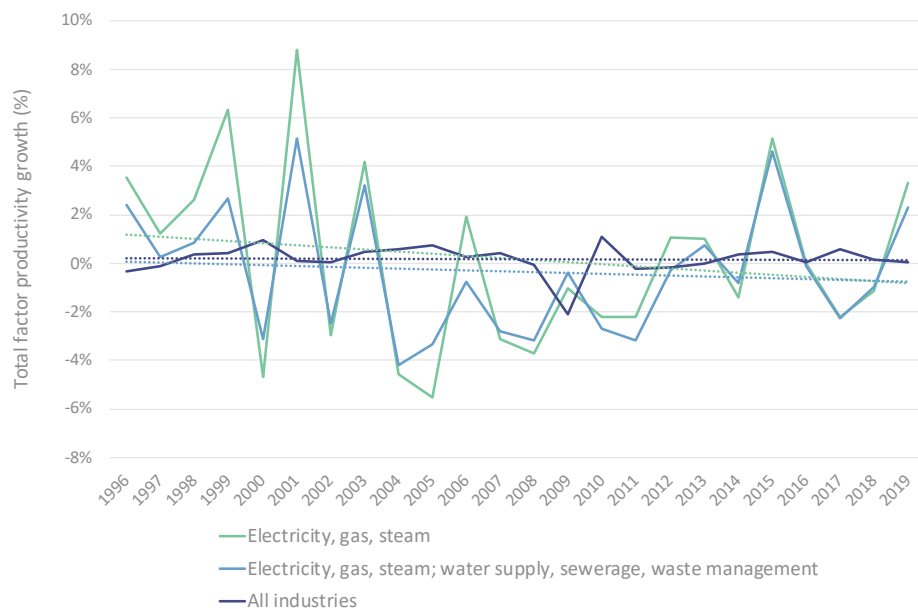
Source: Economic Insight analysis of ONS data

## 1C. Persistent low productivity across industries

The persistently poor productivity performance of the UK is widely known, with total factor productivity (TFP) averaging just 0.18% pa (all industries) since 1996. However, it is less well-known that this pattern is observable across almost all industries, particularly post financial-crisis, where one consistently observes flat-to-falling productivity.

Of relevance to future regulatory approaches for the energy sector, and as shown in Figure 3, we also see low (and declining) productivity in the energy (and water) industries.

Figure 3: Persistently (very) low TFP growth in energy; water; and for the UK overall



Source: Economic Insight analysis of EU KLEMS data

Whilst there are likely several explanations for low and declining productivity, it is worth considering just how consistent this pattern is across most sectors in the UK. Indeed, our recent work on [productivity in the water industry](#) further highlighted a remarkably similar productivity trend across industries.

That consistency, in our view, *points to a degree of commonality in the underlying causes*. In that context, the data on the UK’s overall relative position (and downwards trend) in infrastructure investment, as set out above, is hard to overlook.

## 1D. The low investment, low productivity, cul-de-sac

The precise relationships between investment, productivity and growth are multifaceted and can be complex. We do not comment on this in any detail, save for recalling Paul Krugman's famous quote: *"productivity isn't everything, but in the long run it is almost everything."*

## 1E. Implications for regulatory objectives

Drawing the above together, our main observation is simply that, whilst the need to achieve net zero is clearly central to any future regulatory approach in energy, so too should be the need to find a way out of the low productivity trap we appear to be stuck in. The UK economy as a whole, thus the future wellbeing of its citizens, critically depends on it.

This is particularly pertinent because: (a) we observe this same (i.e. low investment, low productivity) pattern so consistently across industries, including regulated networks such as energy; and (b) those regulated industries can make an important contribution to the UK's overall economic performance.

The implications for future regulatory objectives for energy networks are twofold:

- first, particular emphasis should be placed on regulatory models that are most likely to ensure investment proceeds (even where there may be a trade-off between that and identifying efficient costs in the short term, as we subsequently explain); and
- second, investment should be particularly focused on activities most likely to boost innovation.

### SUGGESTED FURTHER EVIDENCE

In terms of evidence relevant to the above, it would be helpful to examine whether there are identifiable patterns between productivity and investment at an industry level in more detail than outlined in this response document. For example, analysis of key investment metrics (capex; depreciation charges etc as a % of the RAB and energy sector TFP: over time; within specific energy networks; and across countries, may be valuable.





## 2. Archetypes for future network regulation: three compelling reasons to place weight on ‘Freedom and Accountability’

In Chapter 3 of its consultation on regulatory frameworks, Ofgem sets out three archetypes for future network regulation; namely:

- **Plan and Deliver.** Under this model, needs would be defined through a strategic planning process, with competitive tendering / efficient procurement being deployed, in order to ensure cost efficiency.
- **Ex-ante Incentive Regulation.** Under this approach, networks would remain subject to forward-looking price controls. However, Ofgem explains that this could include a mix of options, such as: (i) an incremental revision of the RIIO framework, to reflect changing network needs; (ii) a simpler RPI-X model for ‘*business-as-usual activities*’ (i.e. where the scope of rapid change / enhanced outcomes performance is less); and (iii) the use of ex-post productivity assessments (i.e. where the efficiency of costs is assessed ‘*after the event*’).
- **Freedom and Accountability.** This is, effectively, a form of ‘*cost-pass-through*’ or ‘*rate-of-return*’ regulation. That is to say, under this approach Ofgem would determine outputs and set guidance; and then licensees would identify the model (investments needed) to deliver them. Ofgem explains that there could be some penalties / rewards under this approach applied ex-post (on a light touch basis). Customer protection thus arises from the ‘fixed’ nature of the return (WACC).

In practice, and in line with Ofgem's suggestions outlined in the consultation, we agree that some kind of mix of all the above will likely be needed (particularly given differences between distribution and transmission; electricity and gas; and so on). However, there are three compelling reasons why the *'Freedom and Accountability'* model should perhaps play the most prominent part in that mix.

- (i) **Firstly, because it is the archetype that places most weight on 'promoting investment'**, which is essential in order to hit net zero and address the need to boost productivity, both within infrastructure and for the UK as a whole, as explained in the first main section of this response. As explained in the first main section of this response, in our view the need to help shift the UK economy (and regulated networks / infrastructure industries) out of their current low investment-low productivity stasis should be front and centre of any new regulatory design. Ofgem's *'Freedom and Accountability'* archetype is the one most likely to do this, in essence being a *'rate-of-return'* or *'cost-pass-through'* approach to regulating.
- (ii) **Secondly, the 'Plan and Deliver' model risks giving rise to significant moral hazard problems**, akin to those previously observed under PFI in the 1990s and early 2000s. Under this approach, responsibility for delivery gets parcelled out to an ever-greater number of private sector organisations. However, given the vital need for the infrastructure, it is unclear that investors in those firms would fully bear the risks that were *'priced into'* their winning bids. Thus, this model might either compound the historical under-investment problem; and / or might involve a risk-transfer back to the taxpayer, who would be under-writing the *'true'* risk investors face. This is before one gets to the not inconsiderable challenge of whether, and to what degree, a central plan that is coherent and efficient can be identified in the first place.
- (iii) **Thirdly, the dynamic and unpredictable nature of future network needs can be best accommodated by cost-pass-through / rate-of-return regulatory frameworks.** The problem with the *'Plan and Deliver'* model in this context is that any centralised plan may quickly become out-of-date. Compounding this, once tendering (or efficient procurement) processes are put in place, it is hard to change direction. Similarly, ex-ante regulation (a modified RIIO framework) can only go so far to accommodate changing needs. More uncertainty mechanisms or re-openers provide a degree of flexibility, but the benefits of fixed cost (or outcomes) related efficiency targets under a modified incentive regime may be limited. In contrast, under cost-pass-through / rate-of-return, if needs change, companies are free to alter their plans, secure in the knowledge that, so long as those plans are necessary to deliver against the changed need, investors will be compensated. This allows vital investment to proceed, without unnecessary delay or cost.

In the following we set out the key issues and evidence relating to (ii) and (iii) above (as we have already set out the facts pertaining to investment and productivity).

## 2A. The moral hazard under ‘Plan and Deliver’

In its consultation, Ofgem states that it is possible that the costs that arise under competitive tendering (within its ‘Plan and Deliver’ archetype) may outweigh the benefits. The regulator specifically refers to the risk of ‘winner’s curse’, describing the problem as follows: *“the bidders who make the largest forecasting mistakes tend to win auctions. This can be very hard to overcome in formal tendering processes. It has been suggested that this may have played some role in the difficulties experienced in Private Finance Initiative projects.”*<sup>7</sup>

We think that Ofgem is right to identify the above risk; and that it may be material. However, importantly, we think that in addition to the possibility of ‘winner’s curse’ (under which the problem is ‘accidental’ overpaying, due to forecasting error) there is a further problem: ‘moral hazard’. That is to say, it may well be that winning third-party bidders (i.e. not regulatory incumbents) know that, in reality, they face less risk than appears to be allocated to them under any contracting arrangements. Hence, they do not ‘price’ that risk within their bids; so enabling them to ‘win’. The available evidence would seem to suggest that: (i) when investment / input is critical to the provision of essential public services; and (ii) a public procurement model is used to secure that investment, said *moral hazard is a reality, not a theory*.

There are numerous high-profile examples of where this moral hazard has occurred in practice in the past. This has created situations where the government has been forced to intervene, incurring additional cost in the process.

- **In 2018, Carillion entered bankruptcy because it did not price the full cost into its bids for government projects.** Carillion was the UK’s second largest construction and services firm. At the time of its bankruptcy, Carillion held over 420 public contracts across a range of sectors, including construction; maintenance; and cleaning.<sup>8</sup> It had won many of these contracts by submitting bids that (it transpired ex-post) were less than the cost of delivering the projects.

<sup>7</sup> Consultation on frameworks for future systems and network regulation: enabling an energy system for the future.’ Ofgem (March 2023); paragraph 3.13.

<sup>8</sup> ‘Carillion: Two years on.’ Institute for Government (2020).

Upon Carillion's bankruptcy, it was easy for the government to roll over some contracts to other providers (e.g. the cleaning of prisons and schools), but others (such as the development of new hospitals in Liverpool and Birmingham) have already been delayed by five years and may not be completed. It has been estimated that it cost the Government (taxpayer) £148 million to reallocate Carillion's contracts.<sup>9</sup> In addition, whilst Government did not 'bail out' Carillion, it nonetheless effectively underwrote the business to some degree by virtue of:

- (i) allowing it to enter trading liquidation<sup>10</sup>;
- (ii) its pension scheme entered the Pension Protection Fund<sup>11</sup>; and
- (iii) a package of lending was made available to Carillion suppliers, through the British Business Bank.<sup>12</sup>

Put simply, a degree of risk that (ex-ante) one might have expected Carillion's investors to fully face was, in fact, transferred to Government. This reallocation of risk ex-post should also be seen in the context that Carillion's shareholders were being well compensated until shortly before the company's collapse (Carillion paid record dividends in June 2017, just a month before it released a profit warning and six months before it was liquidated).<sup>13</sup> In addition, the FCA found that the company, and certain directors, 'knowingly' put out misleading statements as to Carillion's financial position and understated the risks to which it was exposed.<sup>14</sup>

- **In 2017, Community Rehabilitation Companies (CRC) contracts operated by private companies had to be changed mid-term.**

21 firms had won bids for Community Rehabilitation Companies (CRC) contracts, which were meant to run between 2015 and 2022. CRCs supervise offenders who present a low or medium risk of harm. In 2017, suppliers requested that their contracts were changed. They indicated that, when placing bids, they had failed to price in the latest projected reduction in volumes of activity. CRCs argued that this reduced volume negatively impacted their earnings (they forecast they would collectively lose £443 million over the lifetime of the contract).

9. 'Strategic Suppliers.' House of Commons Committee of Public Accounts (2018).

10. 'Which meant it was funded to continue providing public service contracts during the liquidation.'

11. 'Which is funded from a levy on other defined benefit pension schemes (including some funded by Government).'

12. <https://www.gov.uk/government/news/multi-million-package-of-support-for-lending-to-small-businesses-and-workers-affected-by-carillion-liquidation>

13. Carillion: Two years on.' Institute for Government (2020).

14. As reported in the Financial Times.

The scale of these losses placed the long-term commercial viability of the contracts in doubt. Following CRC representations to the Government about the level of funding required to maintain the necessary service levels, the government significantly increased the contract values from the £2.1 billion it initially expected to £3.7 billion.<sup>15</sup> This meant the Government incurred the costs of the CRCs' inaccurate volume projections, rather than the private operators.

Within his Cost of Energy Review model, Professor Helm strongly advocates an increased use competitive tendering (at a national and regional level), in relation to enhancement, generation and storage (i.e. analogous to Ofgem's 'Plan and Deliver' archetype). However, in doing so, he does not explicitly address the above risk.

Relatedly, when describing the historical failings of previous regulatory approaches (i.e. the RII model), underspends on totex are discussed by Professor Helm in the context of regulated networks earning returns above their base equity return (an entirely legitimate concern). However, rather than there being 'mistakes' by the regulator in terms of its assessment of efficient costs (i.e. potentially over-funding companies), it is also possible that: (a) the outcomes Helm describes reflect, to some degree, under-investment on behalf of said companies; or (b) that returns were not, in fact, excessive. The fundamental problem, then, is the challenge in distinguishing between cost efficiencies and under-spends.

What we must not lose sight of is that this challenge (identifying efficient costs) is not particularly alleviated under a competitive tendering model. Put simply, under ex-ante regulation, there is considerable uncertainty as to whether any cost benchmarking method used by a regulator can identify the 'true' efficient costs. Equally, however, under competitive tendering, there is considerable uncertainty as to whether the costs proposed by a winning bidder are an accurate measure of the 'true' efficient costs. Thus, in the end, one is taken back to the more fundamental choice: how best to balance: (i) ensuring efficient costs (recognising that measuring this is challenging under either regulation or under tendering); versus (ii) getting investment done.

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15. 'Investigation into changes to Community Rehabilitation Company contracts' Ministry of Justice, HM Prison & Probation Service (2017).

## Implications for future regulatory approaches

In summary, the possibility of moral hazard risk under increased competitive tendering further points towards the *'Freedom and Accountability'* model playing a prominent role in any future regulatory framework.

Notwithstanding the above, to the extent that increased tendering is used, it will be important to consider the ways in which moral hazard risk can be mitigated. For example, if there are independent national and regional systems operators, the ability of incumbents to be one of the entities eligible to bid, and then develop, new enhancement investments may be important. Wide and systematic discrepancies between third-party bids and those of traditional networks would be apparent and could be scrutinised. We note that Professor Helm is clear that in his proposals for energy, incumbents would bid: *"in effect [they] become contractors, and one among many competitive suppliers"*.<sup>16</sup> This should help reduce moral hazard risk.<sup>17</sup>

A further important point is that rate-of-return style models, as an alternative to competitive tendering, at least deal with the excess returns concern Helm identifies.

### SUGGESTED FURTHER EVIDENCE

There would be considerable benefit in developing a systematic analysis and evidence base relating to past investments and services provided under tendering. The aim being to robustly understand the scale of the moral hazard risk one might be inviting, were the energy sector to go that road. Ideally, one would wish to develop a database of key strategic investments subject to tendering, identifying: (i) the range of bidders (quality and price) that participated; (ii) the winning bidder; (iii) where risk was originally assigned under the relevant contract(s); and (iv) ex-post, whether there was any risk transfer back away from the winning bidder (for example, to taxpayers).

In addition to the above, there may be merit in seeking to explore the extent to which, in practice, regulatory models more akin to rate-of return have led to higher prices / costs, relative to alternatives in practice.

16. *'Cost of Energy Review.'* Helm (2017); paragraph 50.

17. This is a point of difference between the energy and water industries, where in the latter, Ofwat is not proposing that incumbents can bid under its direct procurement proposals.

## 2B. A high rate of change and uncertainty indicates rate-of-return models have merit

The third compelling factor pointing towards *'Freedom and Accountability'* is the fast pace of technological change in the energy sector (and the high uncertainty that goes with that). Those characteristics are not well-suited to traditional ex-ante price-cap regulation.

Indeed, Professor Helm recognises this in his conclusion that a 'reformed' RIIO model is not the appropriate solution. He states: *"the future is fundamentally uncertain and challenged by fast technical progress; technical developments are undermining the distinction between networks on the one hand and generation, demand side and storage, and supply on the other; and there are lots of opportunities to let markets reveal costs through auctions, rather than Ofgem try to predict them... The implication is straightforward: there should be no more conventional periodic reviews followed by further eight-year periods. The broad RPI – X regulatory framework has run its course."*<sup>18</sup>

Following from the above, there is a more interesting discussion as to which of *'Plan and Deliver'* (competitive tendering) and *'Freedom and Accountability'* (cost-pass-through / rate-of-return) best accommodates rapid change. We would summarise the pros and cons as follows:

- Under *'Plan and Deliver'*, the main drawback is that it requires central planners (NSOs and RSOs) to determine what is needed. In a world of rapid change, said plans might date quickly. Equally, under competitive tendering, the *'winner'* has signed up to deliver a specified investment with an associated risk-reward balance. If that investment is then deemed unnecessary or inefficient, how does one change course? The advantage of this model, however, is that it reduces the risk of compensating incumbent networks for making *'wrong choices'* as to what is needed in the first places; and / or incurring inefficient costs.
- Under *'Freedom and Accountability'*, the primary disadvantage again comes down to the lack of efficiency incentive. Suppose a network company proposes a change in approach (i.e. different, or larger, investments are needed than originally proposed). Accordingly, the costs of this change are allowed; the new investment proceeds; and the company earns its return. However, what if: (a) the company simply identified the *'wrong'* investment in the first place, and so incurred unnecessary cost; and / or (b) its revised proposals are not efficient? The advantage of this approach, however, is that if the change is necessary, it guarantees it goes ahead to the benefit of society.

18. *'Cost of Energy Review.'* Helm (2017); paragraphs 34-37.

### SUGGESTED FURTHER EVIDENCE

Intuitively, it would seem challenging to have incentives around whether the 'right' choice was made ex-ante (irrespective of whether that choice was made by a central-planner or a company). However, it would be beneficial for Ofgem to consider possible incentive designs in more detail to further inform this. The benefits of said incentives could then be traded-off against the benefits of facilitating rapid 'course-corrections', which would seem to be more easily accommodated under Freedom and Accountability models.





### 3. Designing future network regulation: a regulatory framework for efficiently migrating from natural gas to hydrogen

#### 3A. It is essential to thoroughly examine how future regulation of the existing gas network affects the development of the hydrogen network

Ofgem states that the “*Climate Change Committee (CCC) projections suggest that natural gas usage is likely to decrease by 40-60% by 2035*”<sup>19</sup> The regulator further explains that the decline in the use of natural gas raises several questions about how the regulatory framework should evolve, including: how to share the cost of existing assets in a fair manner; and how to ensure that the gas network is decommissioned / repurposed efficiently.<sup>20</sup>

Importantly, for the reasons set out in this response, Ofgem’s answers to these questions – and its future regulation of the existing gas network – could influence *the cost of delivering the future hydrogen network* and how it is delivered. This is for two main reasons, which we develop in more detail later in this section of our response.

19. Consultation on frameworks for future systems and network regulation: enabling an energy system for the future.’ Ofgem (March 2023); paragraph 2.12.

20. Consultation on frameworks for future systems and network regulation: enabling an energy system for the future.’ Ofgem (March 2023); paragraph 2.13.

- a. First, Ofgem’s future regulation of the existing gas network could influence the cost of capital associated with it *and* the cost of capital associated with the hydrogen network. This arises because Ofgem’s future regulation could provide new information to investors about the riskiness of their investments in UK infrastructure (both in energy and more broadly).
- b. Second, Ofgem’s future regulation of the existing network could influence the extent to which it is delivered using repurposed assets versus new assets, which in turn could influence the efficiency of its delivery, including its costs.

Therefore, our opinion is that there is a *strong* connection between Ofgem’s future regulation of the existing gas network and the Government’s ambition to achieve net zero, supported using hydrogen. Indeed, Ofgem recognises that there is such a connection:

*“Further policy and regulatory development will be needed to establish the RAB as part of government’s overall strategic policy package, and to develop clear methodologies for any connections between the hydrogen and methane RABs. Hydrogen networks and their regulation therefore sit out outside the scope of this particular review, but these changes will form an important context to the decisions on the gas network beyond RIIO-2.”<sup>21</sup>*

However, Ofgem’s Consultation contains only a brief discussion of this important point, noting that:

*“Government is developing a separate business model and regulatory framework for hydrogen networks. The management of any repurposing of existing networks for hydrogen will therefore need to ensure that the costs are transparently accounted for, allocated to the appropriate RAV, and paid for by the appropriate consumers.”<sup>22</sup>*

We agree with Ofgem’s view that it is necessary to develop “*clear methodologies for any connections between the hydrogen and methane RABs*” and, indeed, consider that there is a need for Ofgem to examine them thoroughly as its review progresses. Therefore, in the rest of this section we set out what the connections are; why they matter to the objectives set out by Ofgem and the Government; and the potential implications for Ofgem’s future regulation of the existing gas networks.

21. ‘Consultation on frameworks for future systems and network regulation: enabling an energy system for the future.’ Ofgem (March 2023); paragraph 2.14 (emphasis added).

22. Consultation on frameworks for future systems and network regulation: enabling an energy system for the future.’ Ofgem (March 2023); paragraph 4.20 (emphasis added).

### 3B. Ofgem's future regulation of the existing gas network could influence the cost of capital for the new hydrogen network

The decline in the use of natural gas inevitably raises the question: *what should happen to the existing assets?* If the existing assets are near the end of their useful economic life, and if investors have been fully remunerated for their historical investments, the issue boils down to when and how to decommission the assets. But, if some of the existing assets are not near the end of their useful economic life (and if some cannot be repurposed for hydrogen) Ofgem will need to decide the extent to which customers should continue to pay for the existing assets, *even if they are not used*, or are used less than anticipated when the investments were originally made.

Ofgem could reach the view that investors should be fully remunerated for their historical investments; and so customers<sup>23</sup> should continue to pay for the existing assets until they are fully depreciated. Or, at the other end of the spectrum, Ofgem could reach the view that customers should not pay for the existing assets – and accordingly, investors should bear *all* the risk of technological change (eroding the value of historical investments; and potentially stranding their assets).

Under the first option, the value of the existing gas network RAB would be the same as it would have been without the decline in the use of natural gas. Under the second option, the value of the existing gas network RAB would be lower.

In its Consultation, Ofgem indicates that this raises a question of *'fairness'*, which it undoubtedly does. However, our view is that the two main criteria for Ofgem to consider when evaluating its options should be:

- Criterion 1: which option is most likely to *deliver the investment* in the energy system (including hydrogen) necessary to deliver net zero? This, after all, is one of the Government's main objectives.
- Criterion 2: which option best emulates what would happen in a *competitive market?* Competitive markets help to deliver efficient outcomes - and this is what economic regulation is intended to encourage.

We discuss both criteria on the following pages.

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23. One relevant dimension of fairness is "intergenerational fairness" – the extent to which current and future customers pay for and benefit from current and future investments.

## Criterion 1: Delivering investment in the energy system

### The role of the RAB as a commitment device

The first option is more likely to deliver future investment in the energy system than the second option. The main reason for this is that it best maintains the RAB's credibility as a 'commitment device', as discussed below.

It is well-understood that the purpose of the RAB is to ensure that there are appropriate incentives in place for investors to make significant investments in expensive and long-lived critical infrastructure. It achieves this by acting as a 'commitment' to remunerate investors for their past investments (i.e. the recovery of invested capital; and a fair rate of return on it).

Without such a commitment, investors would face a risk that having made a sunk investment in critical infrastructure, they would only be remunerated by enough to keep their assets operational, but not enough to recover the invested capital and a fair rate of return. As Professor Helm puts it:

*"The temptation for politicians and regulators is to promise ex ante that investors who sink capital will be able to recover their investment and the cost of capital. In other words, they will be able to charge average not marginal costs. However, the time inconsistency [problem] arises when the investment is complete and the assets are in place. Now the politicians and regulators can force prices to marginal not average costs, and the services continue to be provided. They renege on their ex ante bargain with investors."*<sup>24</sup>

Moreover, while the existence of the RAB can act as a commitment device in theory, it is not inevitable that it will do so in practice. This depends on how the RAB is treated by politicians and regulators. For example, following a review of UK and international precedent 10 years ago, Stern concluded that:

*"The role of the RAB as a commitment device is a consequence of the quality of its implementation rather than from the definition of the RAB per se."*<sup>25</sup>

*"If UK regulators were seen by investors as violating that spirit [i.e. as a commitment device], then the RAB's credibility as a commitment device could disappear very quickly – and would be virtually impossible to retrieve."*<sup>26</sup>

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24. 'Utility regulation, the RAB and the cost of capital.' Helm, D (2009).

25. 'The role of the regulatory asset base as an instrument of regulatory commitment.' Stern, J (2013).

26. Ibid.

The so-called ‘*spirit of the RAB*’ is more likely to come under pressure at times of significant technological or structural change. It is then when past decisions are revisited; and questions regarding the appropriate valuation and allocation of existing RABs are raised. In effect, such changes can provide new information to investors about the extent to which politicians and regulators will honour the spirit of the RAB, and hence the riskiness of future investments in the sector. In turn, these changes can influence the amount of future investment that will be attracted; and the cost of capital associated with it.

### **The importance of honouring the ‘spirit of the RAB’ in the UK energy sector**

It is, of course, an understatement to say that the UK energy sector is in a period of significant technological and structural change. It is also an understatement to say that the UK energy sector is in a period where significant investment is required. Thus, the UK energy sector is in a period where the risk of the ‘*spirit of the RAB*’ being inadvertently undermined is likely to be elevated.<sup>27</sup>

Therefore, this criterion suggests that Ofgem should choose the first option: i.e. investors should be fully remunerated for their historical investments; and so customers should continue to pay for the existing assets, until they are fully depreciated.

Newbury<sup>28</sup> has previously stated that:

*“A regulated utility cannot rely on freely determined market prices to value its asset and therefore needs a clearly defined regulatory compact laying down the rules of the game.”*

*“Where there is no competitive market there is a genuine problem, to which the only defensible solution is a backward-looking measure based on history. Any forward-looking valuation would require the regulator to take a view about what the asset would be worth, but as the revenue stream that the regulator is about to set will influence if not largely determine the answer, the utility would be vulnerable to expropriation. The risk would be that the regulator might set the price control on a view about what the market will value the assets at in the future, and might decide this would be a rather low value, which gives a low RAB and hence a reduced revenue stream, on which the low market valuation is justified.”*

#### **SUGGESTED FURTHER EVIDENCE**

To consider this issue in further detail, Ofgem could gather evidence on how historical regulatory and policy responses to technological change affected investors’ perceptions of the riskiness of investments.

27. This would also have consequences for the other sectors that rely on energy too.

28. ‘Determining the regulatory asset base for utility price regulation.’ Newbury, D; Utilities Policy (1997).



## Case study: The Utility Regulator’s 2011 proposal to reduce Phoenix Natural Gas’ Total Regulatory Value (TRV)

The Utility Regulator (UR) proposed that £75m (around 20% of the total TRV) of historically deferred or delayed capex spending should be removed from the TRV (Northern Ireland’s RAB mechanism) of Phoenix Natural Gas (Pngl).<sup>29</sup> This reduction was intended to avoid the system, which the UR believed was both asymmetrical and did not mirror the competitive market, overcompensating Pngl. The UR estimated this TRV reduction would benefit customers by reducing their bills by £10 in 2011, compared to a £6 increase if the TRV was unaltered.<sup>30</sup>

Criticism of this proposal focused upon it being unexpected and not signaled. Key stakeholders produced evidence arguing the following financial and reputational consequences could be incurred.

**Reducing TRV could increase the WACC** There was a risk that the WACC would rise above the UR’s allowed rate of return of 7.5%, which was set without pricing in the TRV reduction. This increase would be triggered by two causes.



**Increase in cost of debt.** The proposed TRV reduction led Fitch to place Pngl upon Ratings Watch Negative.<sup>31</sup> Moody’s signaled that the unexpected nature of the UR’s adjustment increased its perception of Pngl’s regulatory risk exposure. It said if the adjustment was upheld it would also downgrade Pngl. This reaction from credit rating agencies had a clear effect on Pngl’s bonds. Over the year after the UR released its initial decision in August 2011, the differential between Pngl bond yields rose from trading about 60bp above comparators to 100bp.

29. ‘Phoenix Natural Gas Limited Price Control Review 2012-2013 Final Decisions.’ Utility Regulator (2012); paragraph 1.45.

30. ‘Phoenix Natural Gas Limited price determination.’ Competition Commission (2012); paragraph 4.113.

31. ‘Fitch Affirms Phoenix Natural Gas at ‘BBB’; Off RWN; Outlook Negative.’ Fitch Ratings (2012), [Accessed here](#); (4th May 2023).



**Increase in cost of equity.** The increased uncertainty could lead investors to perceive PNGL to be a higher risk company. Unexpected reductions in their returns in one instance could raise their concerns that there is a risk the same could happen again. JP Morgan produced analysis to show that equity betas have moved in line with perceived regulatory risk over the last few years.<sup>32</sup> Even if the cost of equity did not rise on its own, a reduction in the availability of debt finance could force PNGL to raise a greater proportion of finance through equity. This additional demand would increase its cost of equity.

**Reducing TRV could constrain future investment.** RAB mechanisms provide investors with reassurance they will be able to earn a return on their investment. No longer allowing previously agreed returns could create instability and reduce incentives to invest in future projects. This would cause Northern Ireland customers to suffer in the long-term from insufficient investment, particularly in greenfield sites. For example, PNGL contended that it would not invest to expand its network outside its current Licensed Area whilst the regulatory uncertainty persisted.<sup>33</sup>

**Reducing TRV could impact regulated companies in other sectors.** The unpredictable manner of the UR's intervention for gas could make investors concerned that it may behave in the same way for the other sectors that it regulates.<sup>34</sup>

**The Competition Commission (CC) weighed up the evidence and rejected most of the UR's proposals.** It allowed TRV to be reduced by £13.6m – a sum made up of 1999/2000 capex deferrals that were not completed by the end of 2011 - which the UR had previously signaled it would adjust for.<sup>35</sup> This implies the CC prioritised network development and financing costs for future customers, over a short-term cost reduction for current customers.

32. 'Phoenix Natural Gas Limited price determination.' Competition Commission (2012); paragraph 8.64.

33. 'Phoenix Natural Gas Limited price determination.' Competition Commission (2012); paragraph 8.32.

34. 'Phoenix Natural Gas Limited price determination.' Competition Commission (2012); paragraph 8.99.

35. 'Phoenix Natural Gas Limited price determination.' Competition Commission (2012); paragraph 9.97.

## Criterion 2: Emulating the outcome in a competitive market

### **The role of asset specificity in determining competitive market outcomes**

Is there a trade-off between delivering investment on the one hand, and emulating the outcome that a competitive market would deliver on the other? Put another way, does emulating the outcome in a competitive market indicate that Ofgem should move away from the first option, and instead move towards the second option – i.e. customers should not pay for the existing assets (and accordingly, investors should bear all the risk that technological change can erode the value of historical investments?).

It is sometimes argued that, in a competitive market, investors would indeed bear the risk of technological change and customers would not pay for something that they no longer wish to use. However, this type of reasoning does not properly reflect what would happen in a competitive market in which large, sunk, and asset-specific investments are required for a service to be delivered – and, in doing so, such logic risks pointing us towards the wrong conclusion. In fact, there is no inevitable trade-off between Criterion 1 and Criterion 2, when properly considered.

This is because in a competitive market a ‘seller’ would not make a large, sunk, and asset specific investment to serve a ‘buyer’, unless the buyer made a long-term commitment to purchase from it. Without such a commitment, the seller would recognise that it would be exposed to a high risk of expropriation by the buyer. If the buyer subsequently reneged on its long-term commitment, the seller would probably seek compensation from it, and the buyer would probably also find it harder to do business in the future.

### **The split of risk between buyers and sellers in a competitive market**

Therefore, to secure the services of the seller, the buyer would bear some of the risk that the services it is purchasing may become outdated during the life of the contract. The split of risk between the buyer and the seller will turn on who is best placed to control it; and this will influence the design of the contract.

In our context, one might reasonably view the regulatory framework as the contract (underpinned by the RAB); the Government as the ‘buyer’ and investors as the ‘sellers’. Plainly, the Government can (at least) significantly influence the extent to which the services it is purchasing become outdated, because it influences the policies that govern the demand for natural gas (and so, the existing gas network).



That is, in our context, the buyer seems best placed to control risk and, arguably, it is not market forces that have outdated the assets (as could happen in a competitive market), but rather government decision-making.

The implication is that the application of Criterion 2 also points to the first option being the most appropriate approach for the future regulation of the existing gas network.

### **Issues associated with affordability**

There is, of course, another important issue – especially in the context of the present affordability crisis – about which customers should pay for the existing assets and when. This is primarily a question of how the costs of the existing assets should be recovered, not whether they should be; and so we do not consider it in detail here.<sup>36</sup>

We note that one issue to consider is whether the costs should be recovered exclusively from customers using natural gas, or from all customers. This decision could have a bearing on both: (a) the extent to which the value of the existing assets remain within a ‘natural gas network RAB’, versus being allocated to other RABs; and (b) the extent to which other networks are ‘charged’ to help recover the value of the existing assets.

The options include: the costs of the assets should only be recovered from customers that use the assets in the future; the cost of the assets should be shared with all customers, whether or not they use them in the future (because all customers benefit from the spirit of the RAB being honoured); or an option whereby some customers ‘subsidise’ the use of the assets by other customers, on affordability grounds.

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*36. We note that while not honouring the spirit of the RAB could help with affordability in the short-term, it could compromise it in the long-term, due to the effects set out above.*

### 3C. Ofgem's future regulation of the existing gas network could influence the extent to which the new hydrogen network is delivered using repurposed assets versus new assets, which in turn could influence the costs of its delivery

#### **The value of historical investment as a sunk cost**

The considerations set out above indicate that investors should be able to recover the value of their historical investments in the existing gas network.

Whatever that value is, it is sunk; and therefore, it should not affect the extent to which the new gas hydrogen is delivered using repurposed assets, versus building new assets. The two decisions are separable. Instead, decision-making should depend on the net present value to society of the future societal costs and benefits associated with repurposing the existing assets, versus building new ones. If the societal benefits are the same (irrespective of the technology used) then the decision would boil down to a comparison of:

- a. the expected future costs associated with repurposing and using the existing assets; with
- b. the expected future costs associated with decommissioning the existing assets, and building and using new assets.

The alternative approach is for the value of the undepreciated historical investment in the existing gas network to feature in this decision. For example, the depreciation allowances / charges associated with the historical investment might only one be '*counted*' if the existing assets are repurposed, but *not if they are decommissioned*. If this happened, this would lead to an inefficient underuse of repurposed assets, and an inefficient overuse of new assets, thus compromising Ofgem's efficiency objectives.

#### **The financial incentives created by regulated prices**

Ofgem's future regulation of the existing gas network could affect the relative use of repurposed and new assets in the new hydrogen network. This happens when the payments made to investors for historical investments depend on the extent to which repurposed assets are, in fact, used in the new hydrogen network.

Under Ofgem’s Archetype 1 ‘*Plan and Deliver*’, the external system planner “*determines a need for specific activities on the network (new investments, upgrades, etc)*” and “*identifies the most efficient delivery model*”.<sup>37</sup> If the external system planner is responsible for determining the extent to which repurposed assets are used; and (rightly) does not take account of the undepreciated historical investment in existing assets in reaching that decision, then no issue should arise.

However, under Ofgem’s other archetypes, there is perhaps greater potential for Ofgem’s future regulation of the existing gas network to affect the financial incentives that companies have to use the existing assets in the new hydrogen network. In theory, this would happen if the costs they incur, or the revenues they receive, through a price control depend on their *usage* of the existing assets. In practice, this would happen if Ofgem facilitates the recovery of undepreciated historical investment by using a (wholly or partly) variable / volume-based charge.

The implication is that it will be important for Ofgem to consider, not only the level of (historical investment) recovery (as discussed in the previous section), but also the *form* of recovery to ensure that the right usage signals are sent.

#### SUGGESTED FURTHER EVIDENCE

To consider this issue in further detail, Ofgem could identify and evaluate the different forms of recovery (including, for example, the use of multi-part tariffs) and the incentive properties they have, based on economic theory and regulatory precedent.

<sup>37</sup>. ‘*Consultation on frameworks for future systems and network regulation: enabling an energy system for the future.*’ Ofgem (March 2023); paragraph 3.7.



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