



Aligning long-term government policy and the regulation of utility companies

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Executive summary

Almost half of the UK's infrastructure, chiefly water and energy, is financed and delivered by the private sector, and paid for by consumers, under the Regulated Asset Base (RAB) model.¹ RAB-funded infrastructure has received significant amounts of private sector investment since the model's introduction in 1994. In 2018, the total RAB value across the UK's electricity, gas, water and airport sectors stood at over £160 billion, with the vast majority of this centred on the utilities.²

The model of regulation has generated significant investment and improved performance over the past decades. However, it is increasingly facing new challenges that it was not intended to address, including achieving net-zero greenhouse gas emissions, adapting and becoming more resilient to climate change and extreme weather events, contributing to efforts to address the nation's shortage of housing, as well as rapid advances in technology that have the potential to transform infrastructure networks.

Over time, regulators have had to try to balance important factors, such as climate change, against a primary duty to protect the interests of consumers. This has led to difficulties when prioritising strategic investments for the long term which would impose costs on consumers in the short term. Given the increasingly complex long-term solutions that are necessary to tackle the aforementioned challenges, the regulation of economic infrastructure needs to be more flexible.

An emphasis also needs to be placed on the regulated utilities themselves to improve processes. Challenges both today and tomorrow mean that 'business as usual' is no longer an option. While some companies are taking steps to embed new values and decision-making processes within their business models, there is still much to be done to redesign a framework that delivers best value for consumers and investors while meeting strategic objectives, going beyond simply complying with regulation.

It is vital for the government to demonstrate leadership to bring about this change. By setting a clear strategic direction, outlining plans for supporting the development of new technologies and – crucially – putting in place a National Infrastructure Strategy that outlines a stable, long-term vision for the UK's infrastructure networks, regulators, companies and their investors will be better able to evaluate, drive and deliver strategic investments that address core challenges.

This paper, which focuses on the regulated energy and water sectors, examines the changing demand drivers facing regulators and utilities and seeks to make recommendations that, if actioned, will lead to greater flexibility for investment that delivers high-quality, value-for-money infrastructure.

¹ ICE (2018) [State of the Nation 2018: Infrastructure Investment](#)

² Department for Business, Energy and Industrial Strategy (2019) [RAB Model for Nuclear](#)

Recommendations

- In order to account for housing growth and ensure that appropriate infrastructure and network enhancements are in place to enable and support it, utility companies should be core participants in developing evidence-led regional infrastructure strategies. It is important that regulators are also involved in the development of these strategies in order to better evaluate final determinations for price control periods.
- The use of direct procurement models that deliver large-scale infrastructure projects should be further explored and utilised in order to allow for strategic investment, outside of price control periods, that delivers improved economic, social and environmental outcomes. This should form the basis of open and transparent competition, ensuring all options for significant improvements and enhancements to infrastructure networks can be considered, while opening up new possibilities for innovation and enabling new investors to enter the market.
- Regulated utility companies should align their Environmental, Social and Governance (ESG) reporting to a common standard to allow better decisions to be taken by regulators, allowing investment options to be identified that deliver wider social and environmental benefits and better value for money for consumers.
- The government – via its National Infrastructure Strategy – should outline clear, long-term and strategic policy objectives that allow better alignment between regulatory, industry and policy activity. This would provide regulators, industry and consumers with greater clarity on long-term strategic priorities, providing the context for future price reviews and the investments required both within and outside price control periods.

Changing demand drivers for regulating economic infrastructure

The regulatory approach taken by both Ofgem and Ofwat has proved effective since their establishment. Under economic regulation, the cost of transporting a unit of electricity around Britain has fallen by 17% since the mid-1990s, relative to the retail price index.³ Since 2015 there have been significant improvements in distribution network reliability, which in 2018 stood at 99.99%.⁴ Customer network interruptions have fallen by 14%, while the duration of interruptions has fallen by 10%.⁵ In the water sector, over £150 billion of private capital investment has been made since 1989, leading to high-quality drinking water, cleaner rivers and beaches, and household water bills that are, after accounting for inflation, broadly similar to 20 years ago.⁶

However, ICE's 2018 and 2019 State of the Nation reports revealed a growing consensus that the defined regulatory periods governing utilities are preventing strategic, long-term planning and delivery of some of the UK's core economic infrastructure networks.⁷ Think tank Sustainability First has highlighted that short-term affordability is frequently given

³ Ofgem (2018) [Tougher Price Controls for Energy Networks](#)

⁴ Ofgem (2018) [RIIO-ED1 Annual Report 2017–18](#)

⁵ Ofgem (2020) [RIIO-ED1 Network Performance Summary 2018–19](#)

⁶ ICE (2018) [State of the Nation 2018: Infrastructure Investment](#); Chartered Institution of Water and Environmental Management (2019) [Thirty Years On, What Has Water Privatisation Achieved?](#)

⁷ ICE (2018) [State of the Nation 2018: Infrastructure Investment](#); ICE (2019) [State of the Nation 2019: Connecting Infrastructure with Housing](#)

precedence over other goals. This tendency is partly down to regulatory structures (such as having separate environmental regulators), but also due to the way that regulatory duties around environmental, resilience and other issues are prioritised, framed and interpreted.⁸

Although new duties have been added to the remits of the regulators, the system is increasingly facing new challenges that it was not intended to address. These include:

- meeting the 2050 net-zero greenhouse gas emissions target
- the need to build in further resilience to infrastructure networks in the face of climate change
- rapid and uncertain technological changes
- contributing to addressing the housing shortage.

Whereas social and environmental issues are dynamic and cross-sectoral, regulation currently tends to be rigid, sector-based and focused on relatively short-term cycles, with a primary duty to protect the interests of consumers.⁹ While safeguarding consumers and delivering more efficient services are vitally important aspects, more flexibility both in terms of duration and levels of allowed investment could achieve better long-term performance and value for money, alongside enhanced integration of infrastructure networks.

Net-zero targets

Great Britain's electricity system is expected to undergo a fundamental transformation over the coming decades in response to meeting net-zero greenhouse gas emissions targets. In its advice to the government on future carbon budgets, the Committee on Climate Change (CCC) has emphasised the need to invest in a portfolio of low-carbon technologies and to increase the provision of flexibility services to enable the cost-effective integration of the new system.¹⁰

Only 5% of the current energy used for heating comes from low-carbon sources, while there may be as many as 46 million electric vehicles on the UK's roads by 2050, presenting significant demand-side challenges.¹¹ The National Infrastructure Commission (NIC) estimates the energy sector will need to invest £20 billion per year between 2020 and 2050 – £9 billion more than current annual investment – to meet the 2050 net-zero target.¹²

In the context of achieving net-zero targets, Ofgem considers that the role of anticipatory investment may acquire more prominence in RIIO-2,¹³ but details are yet to be outlined.¹⁴

Resilience

The regulated utilities face the combined pressures of population growth and climate change. The UK will need extensive demand- and supply-led drought resistance measures in place by 2050.¹⁵ The NIC estimates the need at 4,000 megalitres

⁸ Sustainability First (2019) [Circling the Square: Rethinking Utilities Regulation for a Disrupted World](#)

⁹ Ibid

¹⁰ CCC (2019) [Net Zero: The UK's Contribution to Stopping Global Warming](#)

¹¹ Ofgem (2020) [Decarbonisation Action Plan](#)

¹² NIC (2019) [Strategic Investment and Public Confidence](#)

¹³ RIIO-2 (Revenue=Incentives+Innovation+Outputs) will be the next price controls for the companies running the gas and electricity transmission and distribution networks.

¹⁴ Ofgem (2019) [RIIO-ED2 Framework Decision](#)

¹⁵ ICE (2018) [State of the Nation 2018: Infrastructure Investment](#)

per day of extra water-supply capacity and, in its National Infrastructure Assessment, recommends the establishment of a national water transfer network to protect against drought.¹⁶ There is also a need to protect supply and ensure adequate drainage for extreme weather events where flooding is a risk.

In the energy sector, increasing reliance by the public and businesses on electricity and its interdependencies, namely communications networks, means infrastructure systems must be resilient to future needs and be able to cope with demand.¹⁷

Utility networks therefore must respond to increasing pressures. The NIC states that investment of £930 million on average per year between 2020 and 2050 will be required to increase drought resilience alone.¹⁸ Low-probability, high-impact incidents such as serious drought are hard to price into a system of economic regulation. The costs of building in greater resilience to a network are felt directly by consumers, but the benefits are uncertain both in terms of their scale and timeframes.¹⁹

Technological developments

For some technologies, their development, deployment and rate of adoption are unpredictable. In order to meet the 2050 net-zero target, it will likely be necessary to invest in untested technology that has a higher risk profile, making it challenging to implement within the confines of the current defined price control period funding model.

Ofwat's £200-million innovation fund in the most recent price review and Ofgem's plan through the upcoming RIIO-2 framework for electricity distribution networks to introduce a new innovation funding pot that targets future-facing strategic challenges are welcome moves in this regard.²⁰

In addition, while infrastructure may be working in its current form, asset owners must adopt new integrated digital approaches to manage and operate existing assets and build future ones.²¹ This includes developing a 'digital twin', enabling asset owners to learn where a system could benefit from improvements and unlock value in new ways for consumers.²²

Housing

Delivery of economic infrastructure to enable and support new housing developments is vital, but planning and delivery of utilities infrastructure within the current regulatory framework is siloed and in many regions too reactive to housing demand, which can often be a cause of delay to construction.²³ The current regulatory structure across the utilities does not prioritise housing, often restricting investment that may need to be planned ahead of need.

¹⁶ NIC (2018) [National Infrastructure Assessment](#)

¹⁷ Energy Research Partnership (2018) [Future Resilience of the UK Electricity System](#)

¹⁸ Ibid

¹⁹ NIC (2018) [Preparing for a Drier Future](#)

²⁰ Ofwat (2019) [Time to Act, Now: Driving Transformational Innovation in the Sector](#); Ofgem (2019) [RIIO-ED2 Framework Decision](#)

²¹ ICE (2017) [State of the Nation 2017: Digital Transformation](#)

²² Ibid

²³ NIC (2017) [Congestion, Capacity, Carbon: Priorities for National Infrastructure](#)

In particular, as regulators' primary functions are to protect consumers' interests, they are keen to ensure that consumers do not pay for unnecessary expenditure on speculative infrastructure enhancements. It is therefore difficult for utilities to recover expenditure on enhancements without being able to demonstrate a need for the enhancement.²⁴

ICE has previously called for the development of regional infrastructure strategies that include housing, involving a multitude of stakeholders including utility companies, regulators, local communities, relevant government departments, delivery bodies, local government, other businesses and academia, in order to ensure a coordinated approach to regional infrastructure provision.²⁵ These strategies should be the product of regional stakeholder collaboration, where key service providers come together in a regional infrastructure forum with other local actors to determine the infrastructure need of a given region. It is also important that any future regional infrastructure strategies are compatible with one another across service-level boundaries such as energy or water networks.

Recommendation

In order to account for housing growth and ensure that appropriate infrastructure and network enhancements are in place to enable and support it, utility companies should be core participants in developing evidence-led regional infrastructure strategies. It is important that regulators are also involved in the development of these strategies in order to better evaluate final determinations for price control periods.

Adapting the existing model of regulation: challenges and solutions

For many investments, such as incremental changes to a network, the current price control process provides a stable regulatory environment. However, for strategic, transformational investments, a short- to medium-term price control may not be the appropriate length of time.

Regulators' default position on new investments (particularly larger, long-term ones) is one of scepticism as the costs of a shorter-term investment will be lower and therefore cheaper to the consumer.²⁶ This is not always the case, however – there are some examples of strategic, longer-term investment being delivered under the existing RAB models. Indeed, in its 2019 price review (PR19) final determinations, Ofwat set out a new 10-year price control period for a £124-million reservoir in Hampshire, while Ofgem has been utilising direct procurement via competitive tenders since 2009.²⁷ This flexibility is to be welcomed, as are the regulators' commitments to examine whether these approaches can be extended in future price reviews and asset management periods.

²⁴ ICE (2019) [State of the Nation 2019: Connecting Infrastructure with Housing](#)

²⁵ Ibid

²⁶ NIC (2019) [Strategic Investment and Public Confidence](#)

²⁷ Ofwat (2019) [PR19 Final Determinations](#); Ofgem (2016) [Evaluation of OFTO Tender Round 2 and Round 3 Benefits](#)

However, it is clear that a more strategic approach could help utility providers tackle upcoming challenges as well as allow investors to have greater transparency on future opportunities for investment. It is right that companies should face scrutiny for their new investments, but this needs to take place within the context of an overall strategic plan for what the networks require.

This section outlines how the existing system could be adapted and improved to better evaluate, drive and deliver strategic investments that address core challenges. This includes:

- furthering the use of direct procurement
- the role of asset owners in improving processes and practices
- how to better align and improve the relationship between long-term policy objectives and regulation.

Direct procurement

Direct procurement models have been gaining varying degrees of traction in the regulated utilities over the past decade. This involves the use of competitive tenders for the design, build, financing and/or operation of projects that otherwise would have been undertaken by the regulated companies themselves. This type of model creates competition and is intended to reduce costs, deliver efficiencies, foster innovation and lead to better outcomes for consumers.²⁸

In the energy sector, direct procurement for offshore transmission owners (OFTOs) first began in 2009. This flagship example was instigated by Ofgem in the face of meeting challenging renewable energy targets, with the regulator granting licences to bidders for new offshore transmission assets via a competitive tender process.²⁹ In 2016, Ofgem estimated that the scale of financial savings for the OFTO competitive tendering were between £683 million and £1.1 billion compared to a non-competitive approach.³⁰

Building on the success of this approach, Ofgem introduced its Strategic Wider Works mechanism, allowing transmission owners to bring forward large investment projects where funding was not awarded as part of price control settlements.³¹ However, since 2013 funding for only three projects has been approved.³²

As part of its latest price review, Ofwat introduced 'Direct procurement for customers' (DPC), a process for water companies to competitively tender for a third party to design, build, finance, operate and maintain infrastructure.³³ This covers large-scale enhancement projects that are expected to cost over £100 million based on whole-life expenditure. Ofwat has left it to the water companies to decide whether their proposals for projects should include initial design and expects regulated companies to operate the tender and procurement processes themselves.

This mechanism could form the basis of open and transparent competition, ensuring all options for significant additional supply capacity can be considered, while opening up new possibilities for improved access to finance, innovation and efficiency. DPC could also prove an effective model on major projects that cut across water companies' boundaries, such

²⁸ Atkins (2016) [Direct Procurement](#)

²⁹ Thomson Reuters (2017) [Direct Procurement: The Story So Far](#)

³⁰ Ofgem (2016) [Evaluation of OFTO Tender Round 2 and Round 3 Benefits](#)

³¹ Ofgem (2020) [Strategic Wider Works](#)

³² Ibid

³³ Ofwat (2018) [Direct Procurement for Customers \(DPC\): Setting Expectations for a High-Quality and Well-Evidenced Case](#)

as water transfer networks or new reservoirs, which the NIC has recommended deploying in order to build in further resilience against drought.³⁴

The direct procurement model in the water sector was first applied on the Tideway project, which achieved low capital costs (see case study below). This type of investment model is one that seeks less risk and a steadier return, with funders taking a longer-term view of the asset. However, Tideway was only able to do this as it is a licensed entity with government-backed guarantees. For typical DPC projects, neither of these factors are likely to be the case.

Case study: Thames Tideway Tunnel

In 2016, a hybrid variant of the RAB model – with excess cost sharing and a cost cap – was applied for the first time to a single asset construction project: the £4.2-billion Thames Tideway Tunnel (TTT) sewerage project.³⁵

Much of the £1.3 billion of private-sector equity finance that was raised to deliver the project came from UK pension funds, representing 1.7 million pensioners, or a quarter of the UK's largest 25 pension funds.³⁶ The project is being funded by Thames Water customers through their bills; bills for 2019/20 include £19 for TTT-related costs, and will eventually rise to no more than £25 per year before inflation.³⁷ This is significantly lower than the £70–£80 initially envisaged, primarily due to access to cheaper finance and efficiency savings.³⁸

In its final determination for PR19, Ofwat anticipates that between three and six projects could be procured under the DPC model by 2025, though only one – United Utilities' £750-million project to safeguard the resilience of Manchester's water supply – is certain to be procured in that period.³⁹

The fact that price control arrangements for DPC are rolled into the PR19 period – as opposed to Ofgem's Strategic Wider Works programme that allows for funding to be awarded outside of price control periods – means that the longer-term nature of these projects is still not considered in a strategic enough context. By looking beyond price control periods and considering capital costs and revenue requirement over a longer timeframe, the longer-term and low-risk aspirations of equity or pension funds can be attracted.⁴⁰ In addition to improving this access to finance, the competition that DPC creates can lead to innovation in the delivery of projects, creating efficiencies both in delivery and operating costs and providing consumers with greater value for money.

³⁴ NIC (2018) [National Infrastructure Assessment](#)

³⁵ Defra (2015) [Thames Tideway Tunnel: Strategic and Economic Case, Costs and Benefits, 2015 Update](#)

³⁶ Cambridge Economic Policy Associates (2017) [Review of the UK Infrastructure Financing Market](#)

³⁷ Tideway (2020) [Delivery Partners](#)

³⁸ Cambridge Economic Policy Associates (2017) [Review of the UK Infrastructure Financing Market](#)

³⁹ Ofwat (2019) [PR19 Final Determinations](#)

⁴⁰ Atkins (2016) [Direct Procurement](#)

Recommendation

The use of direct procurement models that deliver large-scale infrastructure projects should be further explored and utilised in order to allow for strategic investment, outside of price control periods, that delivers improved economic, social and environmental outcomes. This should form the basis of open and transparent competition, ensuring all options for significant improvements and enhancements to infrastructure networks can be considered, while opening up new possibilities for innovation and enabling new investors to enter the market.

The role of asset owners

As regulated providers of an essential public service, UK water and energy companies declare that they place customers and the environment at the core of what they do. But the reality is that some have fallen short in recent years and, as a result, regulated utilities have come under increased scrutiny.⁴¹

Regulators are understandably hesitant to take any enforcement action outside of their current frameworks, but are instead looking to companies to take the lead in establishing their own social contract to deliver their social purpose. A number of firms have taken the lead in this regard, with Anglian Water enshrining public interest outcomes within its business, meaning the company has an obligation to take account of its impact on customers, communities and the environment while balancing the interests of its shareholders.⁴² Anglian Water is also an early adopter of the Infrastructure Client Group's Project 13 initiative, which seeks to change the traditional transactional infrastructure business model to a public interest enterprise structure.⁴³ Organisations using this model are commercially incentivised to deliver better outcomes for users from infrastructure investment.

Yorkshire Water, meanwhile, launched a Decision Making Framework in 2017 that calculates the impact of any business or project decision across six capitals: financial, manufactured, natural, human, social and intellectual.⁴⁴ A key feature of this approach is that non-financial impacts and dependencies can be expressed in monetary terms, allowing Yorkshire Water to better identify opportunities to deliver greater value for money for its customers and embed this into 'business as usual' practices.⁴⁵

For example, the framework can compare the social and environmental costs and benefits of alternative investment decisions, such as restoration of natural flood defences, against more traditional investment in 'hard' infrastructure assets.⁴⁶

This emphasis on 'build less' options is an important one, particularly in the context of net-zero. By calculating the whole-life costs across multiple criteria, project options can be identified and highlighted to the regulators that deliver carbon savings and better value for money for consumers.

⁴¹ Defra (2018) [A Water Industry that Works for Everyone](#); Populus (2017) [The Reputation of the Energy Sector](#)

⁴² Water UK (2019) [Public Interest Commitment Update](#)

⁴³ Infrastructure Client Group (2018) [Project 13](#)

⁴⁴ Yorkshire Water (2018) [The Six Capitals in our Decision Making Framework](#)

⁴⁵ Ibid

⁴⁶ Ibid

Asset owners also need to highlight risks and manage them better. Even though companies are working within the context of longer-term plans (such as water resource management plans), these are rarely updated and can cause the industry to become inflexible to change.

It is important for regulated utility companies to be able to most effectively demonstrate progress on performance across social, economic and environmental goals, going beyond the bare minimum of legal compliance. Environmental, Social and Governance (ESG) reporting exercises are at present primarily backward-looking, taking the form of a report that describes actions taken over the past year. While regulated utility companies are increasingly using the structure of the United Nations Sustainable Development Goals (SDGs) to analyse baseline performance on their ESG reporting, there is little consistency on common metrics used to measure progress.⁴⁷ By convening via an existing forum, for example the relevant trade bodies, and collaborating together to align methodologies and make ESG reporting a more forward-looking exercise, companies can identify and address risks early, share information and create an environment where they can work together to tackle shared challenges. The regulators themselves would also be presented with consistent data, enabling them to make better evidence-based determinations.

Recommendation

Regulated utility companies should align their Environmental, Social and Governance (ESG) reporting to a common standard to allow better decisions to be taken by regulators, allowing investment options to be identified that deliver wider social and environmental benefits and better value for money for consumers.

Connecting long-term policy objectives with regulation

There is no escaping the fact that the future investment needed to meet social, environmental and technological challenges will ultimately be funded by consumers. They need the confidence that their money is being spent on the right things in the right way, that they are not being taken advantage of, and that the benefits are being shared with them as well as with investors.

Prior ICE research has shown that 74% of the British public are keen to hear more from politicians about the benefits, rather than costs, of infrastructure investment.⁴⁸ By bringing the public along on the journey and outlining the benefits that would result from achieving long-term strategic goals, it is possible to redefine what a good outcome from an infrastructure project looks like.

The regulators' duties vary considerably, with inconsistency on aspects such as resilience and security of supply. Crucially, none of the regulators have a direct duty to consider the government's long-term policy commitment of achieving net-zero greenhouse gas emissions by 2050.

It is vital for the government to demonstrate leadership in this regard, both to address inconsistencies and provide clarity as to the direction of travel.

⁴⁷ Sustainability First (2020) [Risky Business? Life in the Pressure Cooker](#)

⁴⁸ ICE (2019) [Reducing the Gap between Cost Estimates and Outturns for Major Infrastructure Projects and Programmes](#)

Recommendation

The government – via its National Infrastructure Strategy – should outline clear, long-term and strategic policy objectives that allow better alignment between regulatory, industry and policy activity. This would provide regulators, industry and consumers with greater clarity on long-term strategic priorities, providing the context for future price reviews and the investments required both within and outside price control periods.

About ICE

Established in 1818 and with over 95,000 members worldwide, the Institution of Civil Engineers exists to deliver insights on infrastructure for societal benefit, using the professional engineering knowledge of our global membership.

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