

Ofgem Open Letter on the next network price control review process

Response from the National Engineering Policy Centre
October 2022

Cross-Engineering Sector Contribution

This is a cross-engineering sector response, produced by the National Engineering Policy Centre (NEPC), a partnership led by the Royal Academy of Engineering between 42 professional engineering organisations that cover the breadth and depth of our profession. Together we provide insights, advice and practical policy recommendations on complex national and global challenges.

The Institution of Engineering and Technology (IET) has led in preparing this response and in particular the team responsible for the IET/Engineering Systems Catapult Future Power Systems Architecture Project, which has been exploring the issues you have highlighted for the past ten years. The Academy has worked closely with the IET to involve NEPC partners in the review and approval of this on behalf of the NEPC.

Structure of the response

We have provided a brief summary of key issues, followed by answers to the four questions posed in the Open Letter.

Further information and support

The NEPC would be very happy to work with Ofgem to provide follow-up engagement for further exploration of any of the areas outlined in this response.

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Summary of key messages

- A major shift in regulatory methodologies is needed to address the transformative impacts of decarbonisation
- The definition of the problem to be solved should be revisited, as a framing in terms of network price control is overly restrictive
- The regulatory framework should be developed to include more than economics, and in particular to embody a mechanism for holistic whole-system oversight (broadly a system architect function as proposed in the Future System Operator role), subject to ongoing development.¹
- Previous work from the Future Power Systems Architecture programme should be reconsidered as a source of insight and ideas for regulatory reforms.
- New approaches must commence during RIIO-2 to meet the pace and scale of change needed.

We welcome the initiative shown by Ofgem and set out in the Open Letter. The energy system is going through transformational changes, and the current governance and regulation arrangements include elements that will inhibit rather than enable the timely developments needed to deliver an affordable, resilient and net zero energy system that supports wider societal goals and operates in the interests of customers.

Future governance and regulation need to place the physics first for an energy system that is changing fast, and then find a balance between policy, market design, economic regulation, commercial contracting, and agnostic technology decisions, keeping focused on societal needs rather than the needs of the energy system.

We recognise that whole energy system regulation is outside of Ofgem's current remit and we therefore strongly encourage Ofgem to work with other parties and government to decide whether legislative change is required to meet future challenges.

We believe our answers to the questions below make a strong case that defining the problem to be solved should be revisited, before looking for the right strategy to deliver it.

Our answers also provide an insight into how future regulation might be taken forward and may contain the building blocks for an entirely new approach to regulation in an environment of significant change, high uncertainty, digitalisation and grid edge and customer participation. We are willing to collaborate and help to build an agile and fair framework needed for the future whole energy system.

In exploring this problem, we would challenge whether the questions asked in the Open Letter stand back far enough from the problem to be solved. We believe the extent of the change ahead begs further questions:

- On its own, is an approach to whole system delivery led by economic efficiency, going to meet the needs of citizens in 2050?
- If efficiency-led is not the sole framework, what other measures both regulatory and non-regulatory will be needed to succeed in reaching the mandated aims for society?

¹ The IET has commented extensively on the Future System Operator role and is keen to engage in its ongoing shaping and development, for more details please refer to: [Proposals for a Future System Operator Role \(2021\)](#), IET, 2021

- Should the regulatory setting include creating and maintaining a strategic plan for achieving net zero in the energy sector, enabling the emphasis in regulatory periods to have a holistic focus on future whole system delivery?
- Can we move to a pervasive open data led approach to regulation that removes information asymmetry between regulator and those being regulated and thus strengthen the likelihood that company returns will reflect the risks they manage?

The engineering profession has been setting out the issues involved for a number of years now, for example through the Future Power Systems Architecture Project² and the Engineering Standards Review³, as well as the work of the Energy Data Task Force⁴. We are now at the point where action has become increasingly urgent if the UK is to achieve its desired outcomes and we recommend that consideration is given not only to post RII0-2 network regulation but also the actions needed within the RII0-2 control period to unlock the major changes necessary. **Fresh thinking is needed before 2028 if the pace and scale of change required by 2050 is to be achieved.**

We have provided some initial responses to your questions below, which we believe highlight the multiple facets of the challenge, of which economics is but one, and would be keen to meet with you to explore this further.

We believe there is a strong case for Ofgem to work with the energy sector to forge an architectural renaissance for energy, building a new whole system perspective.

Responses to the specific questions asked in the Open Letter

1. Do you have any views on the strategic issues we must consider in the development of the next price control review process?

We agree with the importance of all the strategic issues identified in the Open Letter, but this list is incomplete. We would add the following:

- **Rapid escalation:** The rapid escalation of distributed generation, storage and smart demand, together with the expected addition of millions of Internet-of-Things devices, under the control of multiple parties, is likely to create major challenges to energy system integrity and resilience, unless actions are taken to turn these to positive effect. We would here note the importance of other work in progress on the Future Systems Operator, and on the future of local energy institutions, and in particular the IET's response to these consultations.^{5,6}
- **Digitalisation:** The opportunity to use pervasive digitalisation around the grid edge should be harnessed to create an enabling platform for smart innovation to transform how the needs of customers are met, both from the established energy system, their own devices, and local community energy enterprises.
- **Cyber:** The increasing challenges of cyber-security and hostile party action require explicit attention.

² [Future Power System Architecture report - FPSA1](#), Energy Systems Catapult and IET, 2016

³ [Electrical engineering standards: independent review](#), BEIS, 2021

⁴ [Energy Data Taskforce: A Strategy for a Modern Digitalised Energy System](#), Energy Data Taskforce, 2019

⁵ [Proposals for a Future System Operator Role \(2021\)](#), IET, 2021

⁶ [Future of local energy institutions and governance \(2022\)](#), IET, 2022

- **Multi-vector:** The tightening relationship between the energy system and other systems in society, for example transport, health, economic, urban fabric, and between vectors in the energy system (e.g. electricity and gas) will be key and require new approaches including technical, commercial and governance co-ordination mechanisms that are enabling rather than restrictive.
- **New vectors:** The potential evolution of new energy vectors with natural monopoly characteristics, perhaps including hydrogen, carbon dioxide, high- and low-grade heat, cooling, and other green gases requires consideration to enable an integration pathway. We note that the Energy Security Bill was paving the way for Ofgem to embrace this to some extent.
- **Efficiency:** Actions to further embrace demand and end-use efficiency are necessary in an ever more integrated energy system.
- **Losses:** There is potential for much higher levels of network losses in a more highly utilised network asset base.
- **New entrants:** Steps are required to address the strong bias towards incumbency, and high barriers to new entrants.
- **Governance:** Today's governance processes, with current planned enhancements notwithstanding, are unsuited to a world of high uncertainty, many more parties and fast change.
- **Data:** The network industry (in common with the rest of the infrastructure industry) lags society in general in the use of pervasive data to understand its assets and how they are being used. This is changing, and offers huge potential for efficiency, for third party innovation, and for regulatory transparency.
- **Silos:** Today's siloed policy and regulatory environment and responsibility limits are barriers to the need for whole system thinking.
- **Pathways:** A pathway to decarbonisation is needed that is one of continual discovery. The solution will not become clear at a point in time, it will continue to evolve, both in GB and around the world.
- **Failures:** In times of uncertainty there is a need to accept legitimate failure and change course quickly. We are moving from a world where solutions could be determined with confidence to one where we don't know what will scale and at what pace and cost. Multiple pathways will need to be pursued, and effort reallocated according to where success is discovered.
- **Regionalism:** It will be important to address the evolving relationship between local, regional and national strategies and interventions.
- **Reciprocation:** The substantial risks that arise from the reciprocal dependencies between digitalisation and energy need to be recognised explicitly.
- **Adaptation:** The increased levels of threat from climate change as reflected in more extreme weather, with the associated need for adaptation investment and assurance of outcomes (measured in terms of resilience and customer service) must be addressed
- **Supply chains:** There are challenges to national and global supply chains evident in the ability to deliver infrastructure and services, and to do so at predictable and reasonable cost.
- **Embedded carbon:** There is increased interest and need to respond to matters of embedded carbon with implications for cost.
- **Skills:** There is a shortfall in people and skills (capability and capacity) across the landscape and lifecycle.
- **Investment:** It will be important to create the enabling conditions to attract private investment beyond the networks (whole system investment).

- **Citizens:** Citizen “permission” is required to build the infrastructure that is needed as exercised through the Planning regime. This is one aspect of the need to address consumer and societal engagement in the energy system transition.

2. Do you have any views on the case for change we have outlined?

Networks must facilitate innovation and change, not act as a barrier. We agree with the case you have articulated, but believe it needs to be built on as follows:

- A fundamental change is that the focus needs to shift from assets to systems, hence supporting and enabling related change in investor perspective and customer engagement.
- The outcomes sought from energy networks should be reconsidered. Traditionally these have been expressed in quite narrow ways associated with the network itself, but networks are key catalysts for other desired outcomes, and these will likely change over time.
- Considering network company licensed area (or close to them), some ideas as to outcomes to explore could be:
 - The progress of local area, place-based energy development
 - Contribution to employment, prosperity or regeneration agendas
 - Mobility outcomes
 - Transformation of demand, energy efficiency and consumer participation
 - Enablement of third party and consumer investment in decarbonisation-consistent energy solutions
 - Digital enablement and data availability.
- A driving factor in the energy transformation needs to be pace. There is a major risk that networks become a limiting factor to pace given the lead times for connections, reinforcements and other construction of network assets.
- The role of networks is becoming much less separable from other parts of the energy system, for example in digital, in asset versus commercial solutions, and in the interactions between innovative consumer solutions and their impacts on networks.
- The types of activities networks engage in potentially have different risk profiles and might attract different costs of capital. The ownership and operation of physical hardware is very different from, say, digital platforms, or creating integrated local energy systems.
- Network companies play a unique role in place-based energy transitions within the geographies in which they are based. Network regulations will need to enable network companies to deliver place-based energy transitions that can meet various energy system needs of individual regions and areas depending upon the specific needs and characteristics of, for example, the specific sectors and urban developments located within a region.
- The uncertainties of decarbonisation create real risks of asset stranding which are outside the control of networks. Given all the uncertainties involved, acceptance of an element of asset stranding as normal business is probably necessary.
- The scope of Ofgem’s formal remit is not sufficient to address dependencies and there is no obvious approach in place for addressing this; for example, how do Ofgem and Ofcom collaborate to assure that communications infrastructure is in place to serve the demands being placed on digitalisation.

3. Do you have views on whether the changes to the electricity or gas sectors mean that there is a case to consider alternatives to the approach taken in the RIIO-2 price control?

The societal changes ahead are transformational and the RIIO-2 approach of dealing with them via reopeners, essentially means that no treatment is prescribed for any of the major risks and opportunities ahead. As a result, there is no strategy in place and no mechanisms exist to drive change from current business-as-usual to the enabling role of networks in the massive change necessary for decarbonisation.

We believe that fundamental change is imperative for the post 2028 price control, but that the principles from this proposed change need to be applied to the operation of the current RIIO-2 price control. 2028 is too long to wait for the role of networks to shift – they will become a serious blocker to progress well before then with a resultant failure to meet national energy transformation in the timescales required.

During RIIO-2 and most certainly post RIIO-2 we will see the continuing transformation in society brought about through pervasive data and artificial intelligence. The utility industry in general is behind most industries in this regard but is becoming progressively more engaged. Pervasive data and AI create the potential for rich, granular datasets to be available equally to regulators, network companies, third parties and even the public, and for new insights to be drawn. This offers the chance of a much more open, granular and transparent approach to regulation.

Over the timescale to 2028 we should also see significant developments around hydrogen, potentially creating an early need to consider monopolistic aspects that may emerge, and potentially issues of blending within the gas system.

We note that Ofgem is considering alternative future regulatory frameworks. The consultation letter lists the following options, noting that they are not necessarily mutually exclusive:

- 1) *Continued use of periodic reviews, with RIIO being adapted where appropriate to address strategic issues, such as by including incentives around whole-system optimisation.*

The current RIIO approach to periodic reviews has evolved to include incentivisation of outcomes rather than just efficiency savings recognising that, for electricity networks in particular, the need for new investment has increased and will continue over the coming decades. The current cycle of bids by companies for expenditure allowances of any output targets has become a resource intensive negotiation taking place for each price control period. The uncertainty about future investment needs has led to a proliferation of uncertainty mechanisms, adding complexity to negotiations and subsequent delivery.

The current arrangements should have the benefit of providing investment certainty to network companies and give Ofgem (and consumers) confidence that value for money outcomes can be realised. However, it is becoming increasingly clear that price controls need both to be able to adapt to short-term change and provide for long-term investment plans. As such, the current ex-ante 5-year agreements appear overly inflexible and risk not being able to achieve these outcomes.

- 2) *An alternative ex-ante incentive regime, where the control is set in advance, but is based on a simpler target to improve operating efficiency, for example based on a longer-term productivity incentive that is reviewed only as and when necessary, which would reduce the complexity of the process of setting price controls.*

This approach suggests that existing ex-ante price controls are simplified to focus mainly on productivity outcomes. This risks that the price controls deliver efficiencies but do not deliver the outcomes required in terms of investment or whole system optimisation.

This would appear to suggest a reversion to an RPI-X type of price control which was better suited for networks post privatisation where efficiency incentives were sought. It is generally recognised that the majority of efficiency savings have already been realised and the challenge now is one of investment and energy system optimisation. This model does not seem appropriate for the current dynamic energy system environment.

- 3) *A model involving greater user/stakeholder participation to determine investment need or other elements of the price control (e.g. negotiated settlements with customer representatives or with a central planning body such as the Future System Operator). This approach would reduce the scope of Ofgem's direct involvement in setting price controls.*

This model suggests that additional reliance may be placed on the advice or direct involvement from user/stakeholder groups. While this has advantages because it involves network customers in the settlement decisions, devolution of decisions to these groups means that they will need the necessary independence, expertise and funding to be able to take decisions. There is a risk that these groups will not be able to negotiate effectively to achieve the desired outcomes.

- 4) *An ex-post regime, where allowances are set based on a pre-determined rate of return, subject to effective operational delivery. This would represent a material shift in the structure and form of the price control, with incentives primarily focussed on the achievement of delivering whole-system objectives.*

This model suggests that network companies would be given an ex-ante rate of return and a whole system outcome incentive. Effective operational delivery would be assessed ex-post. This could have the advantage of allowing whatever investment is necessary to achieve the energy transition. It could represent a light touch regulatory approach to enable rapid investment in whole systems.

While this could incentivise network companies to invest quickly to deliver whole system benefits, the measurement of whole system outcomes and the expenditure or actions to realise them is likely to be unclear for both Ofgem in setting targets, and companies in committing investment. Removing ex-ante expenditure controls may lead to nugatory investment and higher costs for consumers.

The risk of ex-post disallowance of inefficient expenditure may deter network companies from investing in the first place. Alternatively, if the risk of ex-post disallowance is low then companies may invest in their asset base instead of seeking whole system or flexibility benefits. Because of these risks, either Ofgem or companies may dispute expenditure or achievement of outcomes, so the desired investment agility may not be realised.

Summary comments

Overall, each of these models seeks to build on existing regulatory practice which has the advantage of providing confidence to investors in network companies, reducing their risk and

consequently the cost of capital. However, the models generally represent a way of ensuring that efficiency gains and value for money may be realised – they may not deliver the step change in network optimisation and investment that is required.

Each of these models could be made to work to deliver the necessary investment and whole system optimisation, perhaps some better than others. A mechanism for funding the necessary and efficient investment in these privately-owned monopoly assets is of course necessary. But we consider there is a place for economic incentives for network companies to contribute towards measurable whole system outcomes. As a parallel, the success of renewable energy investment has been based on strong financial incentives.

Overall, we suggest that future price controls should include financial incentives placed on the delivery of better optimised networks and whole system solutions, all targeting the outcomes mentioned earlier in our response.

4. Are there any broad frameworks or options that you think we should consider, including variants and alternatives to those we set out?

We were pleased to see the diversity of possibilities so far surfaced, especially (3) and (4), because these potentially address what we see as key concerns around consumer participation and agility of governance. We would add that radical change to the regulatory framework will likely succeed only if accompanied by a coherent suite of comparable changes to governance (for markets and engineering), to markets and to the policy environment. A whole system approach requires a coherent operating environment (in the broadest sense) to be successful.

This calls for novel thinking in the energy system environment (nationally and internationally), so requires a serious level of consideration. For around ten years, the IET and Energy Systems Catapult, funded by Government, have undertaken a series of investigations under the umbrella of the Future Power Systems Architecture Programme (FPSA). Issues explored include:

- The future functional requirements of the electricity (and to a lesser extent, the energy) system in a transformed world^{7,8}
- How complex systems in other sectors address the challenges of system architecture⁹
- Novel ideas for agile, flexible and inclusive governance for the electricity system, designed to remove incumbency advantage and embrace continuous change.¹⁰

We believe these are all relevant to considering how future regulation might be taken forward and may contain the building blocks for an entirely new approach to regulation in an environment of huge change, high uncertainty, digitalisation and grid edge and customer participation.

⁷ [Future Power System Architecture report - FPSA1](#), Energy Systems Catapult and IET, 2016

⁸ [Review of Future Power System Architecture \(FPSA\) Functions](#), Energy Systems Catapult and IET, 2019

⁹ [Transforming the Electricity System: A report from the IET expert group: Power Network Joint Vision How other sectors have met the challenge of whole-system integration](#), IET, 2014

¹⁰ [Future Power System Architecture report - FPSA3](#), Energy Systems Catapult and IET, 2018

Any framework should explicitly address both strategic direction and delivery, not just one or the other (acknowledging the anticipated role of the Future System Operator). Mechanisms should explicitly incorporate iteration built on feedback loops, informed by the learning gained from monitoring and measuring the impact of changes. The NEPC would welcome further engagement in helping to define and develop that framework.

In doing this, future arrangements should as far as possible seek to learn from and retain the best of RIIO, especially arrangements that reward efficiency and innovation and seek to deliver appropriate shareholder returns for the risks taken.

We suggest there are also lessons to learn from Ofwat's approach to PR24 whereby companies would set out their 5 year business plans in the context of a 25 year delivery strategy, not only **anticipating** change but also **adapting** to it. Applied to electricity, this would at least place 5-yearly reviews in the context of delivering a zero-carbon electricity system by 2035 and a net-zero compliant system by 2050.¹¹ One of the benefits would be to unlock investment that would be 'efficient' when considered over the lifetime of the asset rather than only over a five-year period. This would be particularly relevant to preparing networks to meet the longer-term goals of electrification of transport and heat, and to further decentralisation and offshoring of generation (the latter from a transmission perspective).

We offer the foregoing comments to assist Ofgem and wider government develop a transition strategy sufficiently robust to respond to the challenging pace and complexity of change ahead. We believe that the evidence is now inescapable that the sector needs to forge an architectural renaissance for energy, building a new whole system perspective.

¹¹ [PR24 and beyond: Long-term delivery strategies and common reference scenarios](#), Ofwat, 2021