

Research into Behaviour incentives in response to RIIO-3 Draft Determination

Prepared for Scottish Power Energy Networks

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RIO-T3 Draft Determination: Responding to Ofgem Consultation

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Glossary

Abbreviations	Meaning	Abbreviations	Meaning
AEMC	Australian Energy Market Commission	NIA	Network Innovation Allowance
AEMO	Australian Energy Market Operator	NIC	Network Innovation Competition
AER	Australian Energy Regulator	NICE	National Institute for Health and Care Excellence
AI	Artificial Intelligence	NORAD	Norway's Agency for Development Cooperation
API	Application Programming Interface	NYPSC	New York Public Service Commission
ARERA	Regulatory body in Italy for Energy, Water and Waste Management sectors	ODI	Output Delivery Incentive
ASIC	Australian Securities and Investments Commission	ODI - F	Output Delivery Incentive - Financial
BIM	Building Information Modelling	P4S	Partnering for Success
CAD	Computer-Aided Design	PBR	Performance-Based Regulation
CIHR	Canadian Institutes of Health Research	PCB	Printed Circuit Board
CPUC	California Public Utilities Commission	PCR	Public Contracts Regulation
CRE	French Energy Regulatory Commission	PE	Physical Sciences and Engineering
DARPA	Defense Advanced Research Projects Agency	PICASSO	Platform for the International Coordination of Automated Frequency Restoration
DER	Distributed Energy Resources	PIM	Performance Incentive Mechanism
DNO	Distribution Network Operator	PUC	Public Utilities Commission
ENTSO-E	European Network of Transmission System Operators for Electricity	R&D	Research and Development
EPA	Environmental Protection Act	RDC	Regional Delivery Consortia
ERC	European Research Council	RDI	Research, Development, and Innovation
FDA	Food and Drug Administration	REV	Reforming the Energy Vision
FTIR	Future Telecoms Infrastructure Review	RF	Radio Frequency
GIS	Geographic Information Systems	RIIO-3	Revenue = Incentives + Innovation + Outputs
IMDA	Infocomm Media Development Authority	RoE	Return on Equity
IP	Intellectual Property	SDK	Software Development Kit
JDA	Joint Development Agreement	SH	Social Sciences & Humanities

KORRR	Key Organisational Requirements, Roles, and Responsibilities	SIF	Strategic Innovation Fund
KPI	Key Performance Indicator	SO GL	System Operation Guideline
LS	Life Sciences	SPEN	SP Energy Networks
MARI	Manually Activated Reserves Initiative	SRM	Supplier Relationship Management
MEMS	Micro-Electro-Mechanical Systems	TO	Transmission Operations
MW	Megawatt	TOTEX	Total Expenditure
NEC4	New Engineering Contract, version 4	TSO	Transmission System Operators
NESO	National Electricity System Operator		
NGET	National Grid Electricity Transmission		

Executive Summary

This considers the various strategies and methodologies employed to encourage positive behavioural changes within global comparators. By analysing case studies gathered through a short research period and empirical data, the report provides an overview of how tailored incentive programmes can lead to enhanced productivity and outcomes.

Ofgem should be aware that regulated companies regularly include forecast incentive performance in their internal business cases for funding of particular activities. If Ofgem wishes to genuinely drive behaviour change (and not just incentivise regulatory submission writing) it should aim to set an incentive that will plausibly be associated with revenue in internal business cases through predictability.

Our view is that a panel based performance measurement can be made to work, however in order to effectively incentivise behaviour it should be made as structured as possible and incorporate relevant discipline expert input.

Ofgem should consider the following in the design of this incentive:

- Set standardised evaluation criteria and scoring rubrics and publish these well in advance, ideally before or very early in the first year of RIIO-T3. It should aim to incentivise behaviour changes from the beginning and because companies internally use predicted incentive performance in business cases, a late set of criteria may miss out on this. It is not sufficient for these to be available with only plenty of time to write the submission since this will incentivise the writing of good submissions but not the underlying behaviours.
- A higher frequency of submissions and judging is better for developing expectations of what good looks like. Annual submissions, accompanied by detailed scoring feedback will drive excellence in behaviour because it will rapidly become clear from the “past papers” what constitutes excellence. For this reason, feedback should be reasonably detailed and published for all TOs where practical. Ofgem will wish to consider the balance between confidentiality and driving performance over time. Evaluating and paying out the incentive annually is likely to driver greater change as the iteration process will rapidly establish a baseline of what good performance looks like.
- Establish a judging panel or set of panels that can evaluate each desired behaviour from a position of real expertise which will include subject matter experts from outside the electricity sector. This may not be the exact same panel for each area.
- Where appropriate, peer review may be useful but this should go beyond the sector. For example, a set of managers from other regulated utilities could judge the supply chain behaviour against a set of defined criteria.

Ofgem may also wish to consider whether the incentive to collaborate with NESO is too narrow and could be broadened to include other stakeholders.

It would make more sense to broaden this incentive to include collaboration with stakeholders more generally, including communities and environmental stakeholders. We note that while there are other incentives which have a bearing on stakeholder relationships, they are reputational only.

Managing local relationships is absolutely critical for timely delivery of transmission infrastructure, in addition to its good relationship with NESO, SPEN carries out extensive stakeholder engagement and has built strong relationships with local communities and other stakeholders such as environmental organisations.

1 Purpose

The RIIO-3 Draft Determinations for Electricity Transmission set out Ofgem's proposed framework for incentivising high-quality delivery and innovation across the sector. Part of the RIIO framework is the use of incentives to drive company performance.

One such proposed incentive is the Innovative Delivery Incentive, that was proposed by Ofgem at Draft Determination on 20 March 2025. It aims to reward Transmission Owners (TOs) for adopting novel approaches that enhance delivery outcomes. This incentive is structured as an Output Delivery Incentive – Financial (ODI-F), meaning that companies can earn financial rewards for demonstrable improvements in delivery effectiveness through innovation.

As part of the RIIO-3 Draft Determination consultation, Ofgem is seeking views on the incentive.

SP Energy Networks (SPEN) commissioned Arcadis to support them to consider their responses to ETQ19-ETQ21, specifically through conducting research and analysis of global best practice leading to the generation of proposals to present back to Ofgem.

The consultation questions are:

- ETQ19. Do you agree with the need to introduce an Innovative Delivery Incentive to drive the five behaviours that we've identified and do you consider that there are any behaviours that are missing?
- ETQ20. What are your views on our proposed design of the Innovative Delivery Incentive?
- ETQ21. What are your views on how TOs could demonstrate 'consumer value' to justify rewards under the Innovative Delivery Incentive?

2 Background and context

Upgrading energy infrastructure and facilitating new renewable energy generation and storage is essential in meeting the UK's net zero target (electrification is an important enabler) and unlocking new development (Housing, Data Centres and Social Infrastructure, etc) to deliver the Government's growth agenda.

It is anticipated to be a Suppliers rather than a Buyers' market in Utilities as we move into 2027 and beyond with both Energy and Water Companies delivering major programmes at record levels with a constrained supply market. Whilst we will see new actors in the marketplace, noticeably International Contractors, there is a need to create and sustain capacity as well as to drive innovation and change in the sector. This will invariably require incentivisation and it is good to see Ofgem coming forward with this plan.

Execution Risk, that is delivering on time and on budget given the UK's current mixed picture of major projects is a key concern for Regulators and Government. This brings the spotlight on to project execution and the factors that are essential to on time delivery.

Ofgem has proposed to incentivise efficient project delivery through the use of the Totex Incentive Mechanism which shares cost out- and under-performance between the company and customers.

However Ofgem's concern is that the use of "late ex-ante" allowance setting, while necessary in order to deliver the transformational investment in electricity transmission, blunts the extent of the TIM.

This is because setting the allowance “late ex-ante” i.e. set before delivery but after detailed design, during procurement process or even after:

- Reduces incentive to find efficiencies early in project life cycle which is where theoretically the opportunity is greatest
- Ofgem also wants to incentivise roll-out of previously consumer funded innovations

As part of the draft determination, Ofgem have proposed five behaviour areas:

- 1. Supply chain and contracting**
- 2. Innovations in design and engineering**
- 3. Speeding up delivery**
- 4. Collaboration with National Energy System Operator on strategic planning and outages**
- 5. Roll-out of NIC/NIA/SIF innovations**

Ofgem’s proposal is to use an expert panel to assess TO submissions at two points in the price control period. Other methods such as industry surveys and quantitative ex-ante metrics were also considered by Ofgem but rejected.

The industry survey option was rejected because Ofgem considered it would be very challenging to develop a set of survey questions and recipients which could fully and robustly capture all of the behaviours above.

Ofgem also noted that there would be substantial challenges in setting quantitative metrics ex-ante. It would be very challenging to establish the baseline which TOs needed to exceed in order to earn rewards. If baselines could be established early enough in project lifetimes in order to do this then allowances would not need to be set “late” ex-ante but could be set “early” ex-ante as they are in other regulated sectors however we agreed that the nature of electricity transmission capital costs makes this unrealistic.

Ofgem proposes that it would provide the TOs with the assessment criteria during year one of RIIO-T3.

3 Observations and research findings on behaviour incentives

3.1 Observations

3.1.1 Input incentives

Input-based incentives are an alternative to output-based incentives.

- In an **input-based approach**, regulators incentivise what the target company does rather than what outcome is produced.
- By contrast, a strictly **output-based approach** links revenue almost entirely to quality indicators such as outage minutes or customer complaints, implicitly assuming that firms will search for the cost-minimising mix of inputs once outputs have been specified.

Often, regulators pursue the same desired outcome through a mixture of input and output based approaches. For example, Ofwat incentivises water companies to educate the public about water efficiency and distributing water saving equipment (input based approaches) while also directly incentivising reduction in per capita water consumption.

Ofgem should be aware that regulated companies regularly include forecast incentive performance in their internal business cases for funding of particular activities. If Ofgem wishes to genuinely drive behaviour change (and not just incentivise regulatory submission writing) it should aim to set an incentive that will plausibly be associated with revenue in internal business cases through predictability. An annually awarded incentive will drive greater change because it will drive iterative improvement and allow likely incentive implications to be given a greater role in internal decision making than less frequent incentive awards.

3.1.2 Ex-ante target setting

Construction of counterfactuals and development of Ex-ante targets to incentivise "above and beyond" behaviours is challenging. The key lies in using robust data analysis, stakeholder engagement, and transparent processes to define reasonable expectations. By addressing the inherent difficulties in constructing counterfactuals, regulators can create effective frameworks that drive innovation, efficiency, and compliance without overburdening industry participants.

Some recommended approaches are identified below and three case studies in the USA presented in Appendix C.

Strategy	Description
Robust data collection and modelling	Use historical data, scientific and economic models, and cost analyses to construct credible counterfactuals.
Stakeholder Engagement	Consult industry participants, advocacy groups, and experts to refine assumptions and targets.
Transparency	Publish methodologies and justifications for targets to ensure accountability and trust.
Independent Reviews	Employ third-party evaluations and external audits to validate assumptions and targets.

3.1.3 Nature of the proposed behaviours

Ofgem is proposing to incentivise five behaviours:

1. **Supply chain and contracting**
2. **Innovations in design and engineering**
3. **Speeding up delivery**
4. **Collaboration with National Energy System Operator on strategic planning and outages**
5. **Roll-out of NIC/NIA/SIF innovations**

We note that the first three behaviours are open-ended and would seem intended to drive the same kind of efficient delivery behaviour that would be expected if costs were set earlier in the project lifecycle. That is, they may drive some of the benefit that would come from setting allowances Early ex-ante through incentivising inputs rather outputs (the timely and efficient delivery of the capital projects).

The NESO collaboration incentive drives overall efficiency across the electricity transmission system without necessarily driving a reduction in total costs for the TO.

The innovation roll-out behaviour duplicates some of the “innovations in design and engineering” behaviour except that it explicitly incentivises the deployment of those innovations previously funded via the named mechanisms.

3.2 Research findings

3.2.1 Judging panels

Research has identified three well-regarded panels and committees known for fostering diverse perspectives and avoiding groupthink across different sectors. They are all acknowledged for their commitment to diversity and structured evaluation processes, which help mitigate the risk of groupthink and ensure that a wide range of perspectives are considered in their decision-making. A detailed review of each of these panels and committees is presented in Appendix A and summarised in the table below.

1. **Nobel Prize Committees:** The committees responsible for selecting Nobel Prize recipients are known for their rigorous evaluation processes. They often consist of a diverse group of experts from various fields and countries. The committees employ structured decision-making and promote open dialogue to ensure that a wide range of perspectives are considered, thereby minimising the risk of groupthink.
2. **The Turner Prize Jury:** The Turner Prize, a prestigious award for contemporary visual art, is judged by a panel that changes annually and includes artists, curators, writers, and critics from diverse backgrounds. This diversity is intentional to ensure a broad spectrum of viewpoints is represented. The panel engages in open discussions and debates to evaluate the works, which helps prevent consensus-driven decision-making.
3. **The European Research Council (ERC) Evaluation Panels:** The ERC funds innovative research projects across Europe by using evaluation panels composed of a diverse group of experts from various disciplines and nationalities. These panels employ rigorous peer review processes and encourage critical discussion and debate among members to ensure that decisions are made based on merit rather than conformity.

Research into these and other international panels has identified fourteen approaches to reduce the risk of subjectivity and groupthink in judging panels. These are listed in the table below, along with examples of where each has been effectively applied and an assessment of the potential applicability to Ofgem in RIIO-T3. These include, for example, the importance of the assessor publishing clear and detailed scoring criteria and marking rubric ahead of submission, to allow for self-assessment and to improve transparency of process. As another

example, cycles of repetition and annual evaluation, followed by wide publishing and communication of all submissions and their scoring allows for iterative discovery of best practice.

Approach	Description	Example	Applicable to Ofgem's RIIO-3 panels?
Standardised Evaluation Criteria	Developing clear, objective, and quantifiable criteria for evaluating applications to ensure consistency.	The National Institute for Health and Care Excellence (NICE) in the UK uses standardised criteria to assess healthcare technologies.	Yes
Diverse, Independent and Focussed Panels	Assembling focussed panels aligned to the types of innovation being considered with members from diverse backgrounds and expertise to mitigate individual biases.	The Canada Council for the Arts in Canada uses diverse and independent panels to evaluate grant applications, ensuring a variety of perspectives	Yes
Blind Review Processes	Implementing anonymised review processes to eliminate bias related to applicant identity.	The National Institutes of Health (NIH) in the United States employs blind review processes in grant assessments to reduce bias.	Likely not relevant with three TOs and not practical
Training and Calibration	Providing training for panel members on unconscious bias and aligning their decision-making processes.	The Australian Securities and Investments Commission (ASIC) in Australia offers training to evaluators to ensure consistent regulatory assessments.	Yes
Use of Technology and Automation	Leveraging automated systems or AI tools to standardise evaluations and minimise human error.	Germany uses automated systems to assess applications in its renewable energy incentive programs, reducing subjectivity and human error.	Not proportionate for three submissions
Peer Review	Employing experts in the field to provide informed and balanced evaluations of applications.	The European Research Council in the EU uses a robust peer review system to evaluate research grant proposals	Yes
Transparency and Accountability	Documenting and sharing the evaluation process and decisions to increase accountability well in advance of submission to allow for self-assessment and subsequently providing clear post-assessment feedback to all applicants.	Norway's Agency for Development Cooperation (Norad) ensures transparency by publishing detailed criteria and decision-making processes for funding.	Yes
Appeal Processes	Establishing a mechanism for applicants to challenge or appeal decisions to address potential errors.	The Environmental Protection Authority in New Zealand offers an appeal process for decisions related to environmental permits.	Yes but may not be proportionate
Regular Audits and Reviews	Conducting audits of evaluation processes to identify and rectify biases or inconsistencies.	The Infocomm Media Development Authority (IMDA) in Singapore regularly audits its grant processes for fairness and improvement.	Yes but may not be proportionate
Stakeholder Engagement	Involving stakeholders in assessing and improving the evaluation and funding processes.	Brazil's Ministry of Agriculture engages stakeholders extensively in the design and review of agricultural incentive programs for diverse input.	Yes
Confidentiality	Adhering to strict confidentiality rules and declaring conflicts of interest to ensure that decisions are made objectively and without undue external influence	The FDA Advisory Committees are adopting strict confidentiality rules in evaluating applications for new drugs, medical devices, or biologics.	No

Approach	Description	Example	Applicable to Ofgem's RIIO-3 panels?
Restricted membership	Depending on the program and the number of applications, restrict panels to e.g. three to seven members with deep expertise for a balanced discussion	Membership of the EPA Science Advisory Board is restricted to scientists, engineers, and economists with advanced knowledge in relevant fields such as environmental science, toxicology, chemistry, and public health to ensure that a wide range of expertise is brought to the table to address complex environmental issues	Yes
Periodic cycles and repetition	Repetition and annual evaluations with clear scoring to foster a culture of continuous improvement, benchmarking, risk management and innovation	In the pharmaceutical industry, regulatory compliance, safety, and efficacy are paramount. Companies must adhere to strict guidelines when developing and manufacturing drugs. Regular evaluations and clear scoring of submissions can help these companies optimise their processes.	Yes
Experienced chairperson	Appoint experienced panel chairpersons who ensure that a wide range of perspectives are considered during deliberations	The National Institute for Health and Care Excellence (NICE) in the United Kingdom appoints experienced chairpersons for its committees, often selecting individuals with extensive backgrounds in healthcare, academia, or public health policy. These chairpersons are responsible for steering deliberations and ensuring balanced discussions.	Yes

Noting the value of considering stakeholder relationships with environmental and community stakeholders, it would be worth considering including relevant stakeholders in any panel evaluating those relationships.

Research has also identified six potential alternatives to judging panels. These are summarised in the table below and outlined in more detail in Appendix B. The conclusion is that none are likely to be suitable candidates for RIIO-T3 on their own, but Ofgem might consider using them as part of a hybrid approach:

Alternative approach to judging panels	How it works	Comments on applicability to Ofgem RIIO-3	Applicable to Ofgem's RIIO-3 panels?
Crowdsourcing and Open Innovation Platforms	Industries use online platforms to gather input from a broader audience, including employees, customers, or external innovators, to evaluate and vote on ideas.	Casts the net too wide across disparate stakeholders to be effective on its own without expert input	Potential as part of a hybrid approach with a panel making the final decision. Similar to survey which Ofgem has already rejected.
Data-Driven and Algorithmic Evaluation	Submissions for awards are assessed using pre-defined metrics, algorithms, or scoring systems that analyse data objectively (e.g., financial impact, scalability, environmental benefits).	The algorithm will need to be built and agreed, and the approach is unlikely to be effective on its own	Not proportionate for three submissions.
Peer Review Networks	Participants in the industry (e.g., innovators, researchers, or practitioners) evaluate each other's submissions anonymously or semi-anonymously.	Would still need a structure to make a final decision	Wider peer review networks could potentially support panels as part of a hybrid approach. With three TOs it would be challenging to review each other's work.
Gamification and simulation-based	Submissions are evaluated through simulated real-world scenarios or gamified challenges, where the effectiveness of ideas can be tested in practice.	Too uncontrolled and complex to be effective	Not applicable

Stakeholder voting systems	Stakeholders (e.g., customers, employees, or community members) are invited to vote or rank submissions, often using digital platforms.	Casts the net too wide across disparate stakeholders to be effective and reliable on its own	Likely not applicable as better done via inclusion of appropriate representatives on panels.
Hybrid approaches	Combines panels with one or more of the alternatives above (e.g., a panel makes the final decision after crowdsourcing or algorithmic evaluation narrows submissions).	The combination panels with some of the options above might enhance Ofgem's approach	See comments above

3.2.2 Global examples of how other regulated industries are using performance incentivisation to drive behaviour improvement

We conducted a short research phase (three days) associated to the five areas identified by Ofgem in the draft determination. The overarching question we were seeking to address through the brief research period for this report is:

How are other regulated industries/utilities globally (i.e. Europe, Americas, Asia Pacific) using performance incentivisation to drive improvement?

Ofgem DD theme	Research considerations
Supply chain and contracting	How are other regulated industries driving reduction in delivery cost (and achieving demonstrable outcomes) through incentivisation? Where does this incentivisation occur in the project lifecycle? Are different models achieving different outcomes depending on this? Is it driven more by commercial and contract models and how do KPIs and SRM process align?
Innovations in design and engineering	How are other regulated industries unlocking innovation in design and engineering via incentivisation? How do they make this work on a project-by-project basis? Does driving incentivisation in design and engineering compliment efforts in supply chain and contracting or does it have any unintended consequences?
Speeding up delivery	Similar to above, does incentivising speed of delivery (schedule) complement supply chain and design incentives too? examples of how this can be achieved (and evidence of being achieved globally by regulated utilities) would be helpful.
Collaboration with NESO on strategic planning and outages	In other global / regulated utility environments, how do they maximise collaboration between the system operator, regulator, and operator? Is there any evidence that incentivisation of performance in these areas is being utilised? And what benefits are being achieved? Are there other incentives for improving stakeholder management or co-ordination with other regulating bodies.
Roll-out of NIC / NIA / SIF innovations	How are other regulators in regulated industries unlocking innovation through the implementation of competitions, funds, and allowances? Is there any evidence of these being effective and what benefits are being achieved? NIC = Network Innovation Competition SIF = Strategic Innovation Fund NIA = Network Innovation Allowance

3.2.2.1 Supply chain and commercial

Organisations should embrace a streamlined, programmatic approach to focus on integrating the supply chain efficiently. This includes early identification of key suppliers for materials, components, expertise, and understanding market dynamics, such as pricing trends and potential disruptions. Increase the use of joint working to co-create solutions and the promotion of genuine two-way dialogue.

Re-baseline supply chain performance incentives on a regular basis. In the U.S., when state regulators approve multi-year Infrastructure Replacement Plans for gas utilities, they often build in a mid-term “integrity management reforecast” that resets contractor pace-of-play bonuses. For example, following an industry-wide shift to trenchless insertion techniques in 2023, Pennsylvania’s Public Utility Commission allowed utilities to increase their per-mile ahead-of-schedule bonus from \$500 to \$750 after demonstrating network-wide safety and cost benefits thereby realigning contractor incentives with the latest technology efficiencies.

Each of these re-baselining’s underscores the importance of maintaining dialectic momentum between the macro-level settlement and the micro-level incentives: without regular recalibration, incentives can become misaligned with both evolving policy imperatives and supply-chain capabilities.

Early adopters of Project 13 are already realising the impact of behavioural incentives across the supply chain ecosystem through new ways of working. Project 13 is a transformative infrastructure delivery model that replaces traditional transactional arrangements with long-term, collaborative enterprise relationships. It aims to improve outcomes for customers, enhance productivity, and foster innovation across the infrastructure sector.

Sydney Water – Partnering for Success (P4S)	
What Was Done	<ul style="list-style-type: none">• Sydney Water adopted Project 13 principles through its Partnering for Success (P4S) initiative, forming long-term alliances with three Regional Delivery Consortia (RDCs) and an Integrated Planning Partner.
How It Was Done	<ul style="list-style-type: none">• This model replaced fragmented, reactive procurement with a unified framework covering design, construction, maintenance, and operations
Outcomes Achieved	<ul style="list-style-type: none">• 5–10% annual programme savings compared to traditional procurements• Improved collaboration and decision-making through NEC4 contracts and integrated teams.• Secure pipeline of work encouraged RDCs to invest in innovation and workforce development.• Shared purchasing led to economies of scale and deeper supplier relationships.• Enhanced community engagement through regional stakeholder strategies.• Innovation fund created from program underspend to reinvest in future improvements.

UK case study: Ofcom’s approach to incentivising the supply chain is primarily embedded within its procurement and regulatory frameworks, rather than through direct financial incentives like those seen in energy regulation. Ofcom operates under the Public Contracts Regulations (PCRs) and, from February 2025, the Procurement Act 2023, which aims to streamline procurement processes and improve access for small businesses, start-ups, and social enterprises. This legislative shift is designed to enhance competition and innovation within the supply chain by making it easier for a broader range of suppliers to engage with Ofcom.

While Ofcom does not use incentive mechanisms in the same way as Ofgem’s RIIO framework, it does encourage supply chain efficiency and resilience through transparent tendering processes, competitive

thresholds, and value-for-money assessments. For example, procurements over £100,000 are led by Ofcom's Commercial Team and involve rigorous evaluation to ensure suppliers meet performance and risk management standards.

The lack of diversity across the telecoms supply chain creates the possibility of national dependence on single suppliers, which poses a range of risks to the security and resilience of UK telecoms networks. E.g. Huawei. To mitigate the risks associated with this, the Government's Future Telecoms Infrastructure Review (FTIR) sets out a package of policy interventions to support market expansion in 5G – including improving access to spectrum, removing barriers to roll-out and promoting new infrastructure models. It is expected that this will support the development of a more diverse supplier base over time.

We have not found other examples of economic regulators specifically promoting specific supply chain practices, except for:

- Promotion of purchasing from particular types of businesses to support wider social or economic goals which is a common requirement, particularly in the United States.
- Domestic content requirements, either to support policy goals more broadly or specifically for purposes of national security.

We note that if Ofgem is going to incentivize particular approaches to the supply chain it should make it clear ex-ante how it is going to assess this and what would represent baseline delivery.

What Ofgem could do:

- Evaluate supply chain and commercial approaches relative to CIPS maturity standards or other frameworks which aim to objectively measure the sophistication of supply chain approaches.
- Set a standard level of performance within the framework with a detailed scoring rubric that makes clear what constitutes baseline performance for which additional rewards are not available and what constitutes genuinely leading behaviour.
- Delegate judging of this component to supply chain experts (rather than to sector stakeholders)

3.2.2.2 Innovation in design and engineering

To achieve improvements in the design and engineering stages of programmes, organisations need to utilise new ways of working, leverage data and embrace new technologies.

Universal adoption of digital tools across Transmission Operators (TOs) and their supply chains is essential to unlocking sector-wide efficiencies and resilience. Promoting a standard suite of interoperable tools such as common asset management platforms, digital twins, and data analytics systems can drive consistency, reduce duplication, and enable seamless collaboration. Regulators should consider incentivising TOs to adopt these shared systems to accelerate innovation, improve transparency, and reduce lifecycle costs. For example, standardised condition monitoring tools can reduce reactive maintenance costs by up to 30%, while shared data environments can cut project delivery times by enabling real-time decision-making across stakeholders.

By aligning digital strategies, the industry can move from fragmented procurement to a unified, value-driven model delivering better outcomes for customers and the environment.

Energy security is critical for Great Britain, and it is important that we both have the right skills and capabilities now, and for the future. Consideration should be given to the notion of having a match-fund advertising campaign with key stakeholders to promote routes into energy careers.

UK Case study:

The global nuclear market was valued at USD 34.43bn in 2023 and is predicted to become USD 45.31bn by 2032, growing at a CAGR of 3.10%. Nuclear power expansion will lead to an increased demand for materials and resources, technology and skilled labour. A multi-faceted approach is needed to address the skills gap. To

address this the UK Nuclear industry is developing plans to establish a Nuclear Skills Delivery Group under the leadership of the Nuclear Skills Delivery Board. Taking a strategic industry wide approach will help attract and train the workforce required to deliver the UK Nuclear strategy ambitions.



ENTSO-E – Pan-European Digital Design Coordination	
What Was Done	<ul style="list-style-type: none"> ENTSO-E facilitated a pan-European initiative to harmonise digital design tools and data exchange standards across Transmission System Operators (TSOs).
How It Was Done	<ul style="list-style-type: none"> Established common network code-compliant digital data standards (e.g., KORRR). Implemented a shared digital platform for cross-border transmission design data. TSOs and suppliers adopted standard APIs for real-time design data sharing and version control. Incentivised adoption via coordination premiums as part of regulated revenue streams.
Outcomes Achieved	<ul style="list-style-type: none"> Enabled transparent, efficient cross-border design collaboration, cutting coordination times by 25%. Reduced data inconsistencies and regulatory non-compliance risks. Accelerated grid code harmonisation and European energy market integration. Early project planning accuracy improved, reducing overall project costs by ~5%.

Electricity Transmission Operator in Australia – Cloud-Based Design Collaboration	
What Was Done	An Australian TO implemented cloud-based collaborative design suites integrating CAD, GIS, and project management tools.
How It Was Done	<ul style="list-style-type: none"> Mandated usage of cloud platforms by all design contractors and suppliers. Enabled mobile and field access for real-time issue capturing during site surveys.

	<ul style="list-style-type: none"> • Integration with procurement systems linking design changes to supply chain workflows. • Provided ongoing training and support to facilitate adoption.
Outcomes Achieved	<ul style="list-style-type: none"> • Reduced design approval cycles by 18% due to simultaneous multi-stakeholder access. • Design change requests dropped by 22% from early-stage validation. • Improved procurement accuracy, reducing supply delays tied to design errors. • Greater resilience in project timelines ensured through enhanced communication.

Universal adoption of digital tools by Transmission Operators and their supply chains notably accelerates the design stage, enhances collaboration, reduces errors, and improves regulatory compliance. These efficiencies translate into significant cost savings, shorter project timelines, and a more resilient transmission sector that can better integrate evolving energy resources.

Creation of Collaborative Innovation Partnerships- The high levels of R&D and time taken to develop technically capable products is likely to act as a barrier to entry and expansion. There is intense competition across vendors and R&D plays a significant role. To overcome this, one could establish joint development agreements (JDAs) or co-investment models where both utility and supplier share innovation risks and rewards. Additionally, provide suppliers early access to utility specifications and feedback loops fostering design improvements without strict cost-cutting pressures.

Global Case study: US utilities working with technology vendors in co-funded pilot projects to develop advanced grid equipment, with risk-sharing on deployment costs. Utilities co-invested in new control technology pilots with suppliers, sharing deployment risks. This reduced supplier financial risk and accelerated tech maturity.

Greater interoperability and more open interfaces will be required to facilitate new entrants. It is not sufficient that interoperability is included in technical standards industry must work to ensure equipment from different vendors is interoperable in real world deployments

High R&D requirements mean that vendors need to undertake significant investments, some of which involve fixed and irrecoverable costs. In such markets, economies of scale can drive firms to chase volumes in order to reduce average costs and offer lower prices than smaller rivals. The investment risks involved can act as a barrier to the entry and expansion for smaller players.

Standardise Technology and Processes, with allowance for a degree of flexible customisation- Define standard design frameworks that ensure regulatory compliance and predictability while allowing suppliers to innovate in non-critical subsystems or materials to improve performance or reduce lifecycle costs. This balances regulatory certainty with innovation incentives without squeezing supplier cost structures.

Example: European TSOs use standard network codes but encourage suppliers to develop modular control systems within these frameworks. Defined mandatory codes but allowed trial modules for innovation. Suppliers innovate in non-core areas without jeopardising contracts.

Regulatory Support for Innovation Investments- Regulators offer regulatory asset treatment for pilot or demonstration projects, meaning suppliers' R&D or early deployment costs can be capitalised rather than expensed immediately. Grant temporary regulatory relief or faster approvals for innovative designs reducing supplier financial risk in upfront investment. Examples in table below.

In conclusion, promoting design innovation without reducing supplier cost recovery hinges on aligning incentives toward innovation outcomes, sharing risks and rewards, ensuring regulatory support for cost recovery,

standardising frameworks with innovation flexibility, and de-risking through certification. These approaches have proven effective across regulated utilities internationally, enabling innovation while maintaining supplier financial stability and reducing market risks.

What Ofgem could do:

- Establish clear expectations, potentially linked to whole-economy innovation trends (which Ofgem also uses to set its Ongoing Efficiency) targets for what constitutes baseline innovation for which TOs are funded through their regular allowance.
- Use input from experts who are familiar both with the electricity transmission sector and with technological innovation adoption to score submissions.

3.2.2.3 Speeding up delivery

TOs should seek to **standardise designs and use readily available components**. Incentives should target an increase of offsite assembly to reduce demand for key skills on site, speeding up the overall construction schedule. We are aware that this is already being progressed through the Transmission Acceleration Action Plan and would note that Ofgem will wish to set a baseline for performance which takes this into account.

Suggestion: Incentivise achievement of indirect timelines, e.g. stakeholder-process timelines, submittal of compliance reports.

UK case study: Ofcom is accelerating project delivery primarily through regulatory strategies that promote competition and incentivise investment in gigabit-capable networks. Ofcom's Telecoms Access Review 2026 - 31 outlines several mechanisms to accelerate network rollout:

1. **Infrastructure Access:** Continued regulation requiring Openreach to provide access to its ducts and poles, enabling faster deployment by alternative network providers.
2. **Geographic Differentiation:** Tailored regulation based on competitive conditions in different UK regions to encourage efficient commercial deployment.
3. **Support for Altnets:** Ensuring reasonably efficient alternative networks can compete and scale, especially in harder-to-reach areas.
4. **Complementing Public Investment:** Regulatory support for government schemes like Project Gigabit, which targets rural connectivity.

These strategies are designed to reduce barriers, improve delivery timelines, and maintain investment momentum

Performance-Based Regulation (PBR) Pilots- Several U.S. state regulators are trialling PBR frameworks that include specific targets for stakeholder-process timeliness (e.g., asset-planning consultations with state commissions) and dispute-resolution effectiveness, with revenue adjustments of up to ± 30 basis points on authorised ROE.

<i>Hawaii: Exemplary Service PIMs- Regulatory Process Performance Mechanism (Phase 2 PBR)</i>	
What Was Done	Hawaii implemented Performance Incentive Mechanisms (PIMs) under Phase 2 of its Performance-Based Regulation (PBR) focused on timely regulatory filings and effective dispute resolution.
How It Was Done	<ul style="list-style-type: none"> • Timely Filings: ± 15 bps adjustment on ROE based on on-time submittal of annual PBR compliance reports and revenue-adjustment petitions. • Dispute Resolution: ± 10 bps adjustment linked to the resolution of informal complaints and avoidance of formal docketed disputes over billing and service quality.

Outcomes Achieved	<ul style="list-style-type: none"> • Report Filings: 100% on-time record in Year 1, yielding full +15 bps uplift. • Informal Complaints: 20% fewer formal dockets filed, unlocking +8 bps to ROE.
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Connecticut: Investigation Docket 21-05-15 (RE01/RE02/RE03). Stakeholder Engagement PIM

What Was Done	Connecticut proposed Performance Incentive Mechanisms (PIMs) to encourage improved stakeholder engagement and dispute resolution by utilities.
How It Was Done	<ul style="list-style-type: none"> • Utilities were incentivised up to ± 25 bps on ROE for timely stakeholder workshop scheduling, prompt posting of materials (within 48 hours), and documented incorporation of feedback into rate proposals. • An additional +5 bps ROE credit rewarded utilities achieving a $\geq 90\%$ success rate in resolving customer grid-service disputes informally before formal commission docketing. • The approach involved utility monitoring, reporting, and independent verification of stakeholder process and dispute outcomes.
Outcomes Achieved	<ul style="list-style-type: none"> • Improved stakeholder participation and transparency through timely workshops and material dissemination. • Enhanced trust with documented consideration of stakeholder input. • High pre-docket dispute resolution rates reduced formal complaints, improving customer satisfaction. • Anticipated ROE adjustments aligned utility incentives with public engagement and service quality.

What Ofgem could do:

- We note that delivery timing is very easy to measure and that delivery baselines are already set for projects and set from an early stage (although they can be varied). However the baselines are very challenging to set ex-ante from an early stage.
- Therefore it may be possible to incentivise early delivery explicitly rather than to incentivise exclusively behaviour intended to accelerate delivery we note that Ofgem already incentivises this directly for ASTIs and via the proposed CSNP-F ODI.

3.2.2.4 Collaboration with NESO on strategic planning and outages

Cross-Regulator Coordination Bonuses for coordination beyond just the system operator

In jurisdictions like the EU, TSOs receive “coordination premium” adjustments when they meet pan-European data-exchange standards and contribute to ENTSO-E working groups on congestion management, creating a financial uplift to their base revenues for demonstrated inter-regulatory engagement.

Country	Regulator	Coordination Premium	Conditions
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Germany	Bundesnetzagentur	WACC adders for SO GL compliance	Full implementation of ENTSO-E data-exchange standards
France	Commission de Régulation de l'Énergie (CRE)	RoE adders for RDI & coordination	Active participation in ENTSO-E working groups (SO GL, RDI)
Finland	Energy Authority	Capacity-building premium	Timely submission of pan-EU data, engagement in PICASSO/MARI
Italy	ARERA	Innovation and coordination adder	Delivery of common network-code tools and cross-border platforms

Notes: "bps" = basis points (0.01%); WACC=Weighted average cost of capital

We note that this is quite a narrowly defined incentive which seems at odds with the broad nature of the behaviours being promoted elsewhere in the incentive. It would make more sense to broaden this incentive to include collaboration with stakeholders more generally, including communities and environmental stakeholders. We note that while there are other incentives which have a bearing on stakeholder relationships, they are reputational only.

Managing local relationships is absolutely critical for timely delivery of transmission infrastructure and our view is that most TOs already have excellent working relationships with NESO but not necessarily always with other stakeholders.

What Ofgem could do:

- We suggest that this behaviour could be assessed based on NESO's opinion directly via a series of structured questions.
- We suggest that Ofgem consider whether it would be appropriate to broaden stakeholder relationship management beyond only NESO.

3.2.2.5 Roll out of NIC/NIA/SIF innovations

Regulators mandate active dissemination—requiring licensees to share results and facilitate adoption by others. Some mechanisms grant temporary regulatory relief or streamlined approvals so innovative solutions can transition quickly into mainstream practice. Potential concepts include:

Key Concept	Description
Compulsory learning transfer	<p>Projects must deliver implementation guides, open intellectual property where feasible, and demonstrate practical benefits that other licensees can realise. Sharing life from experience.</p> <p>This is built into the current innovation toolkit already so any further incentive would need to incorporate the sharing expected as part of NIC/NIA/SIF as an expected performance baseline.</p>
Temporary regulatory exemptions	<p>"Waivers" or trial rule changes allow rapid deployment alongside evaluation.</p> <p>Ofgem has in the past employed this approach in electricity distribution regulation.</p>
Third-party/cross-industry involvement	<p>Many funds require partners from outside the regulated entity, ensuring broader market uptake.</p> <p>This is already typical for Ofgem funded innovation mechanisms.</p>

UK RIIO-2 RDI Funding with Learning Transfer

What Was Done	Compulsory learning transfer requirement for network innovation projects funded under RIIO-2
How It Was Done	Ofgem required each project to produce open-access technical reports, IP-free case studies, and host industry workshops; licensees submitted peer adoption plans
Outcomes Achieved	<ul style="list-style-type: none"> • 25 innovation reports published • 60% of DNOs adopted at least one innovation • Estimated system savings of £15 M/year

We note that regulators also take other actions to promote innovation such as providing regulatory sandboxes and that Ofgem has done so in the past.

AEMO Innovation Sandbox (Australia)

What Was Done	Temporary regulatory waivers granted for trial of virtual power plant aggregation
How It Was Done	AEMO, AER & AEMC jointly authorised a 12-month waiver of select network charges; participants published implementation guides and open-sourced control algorithms
Outcomes Achieved	<ul style="list-style-type: none"> • 90 MW of distributed resources aggregated • Best practice manuals adopted by four other aggregators

CER Regulatory Sandbox for Grid-Edge Platforms

What Was Done	Two-year trial exemption from certain filing requirements for a pan-Canadian grid-edge data-exchange platform
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How It Was Done	CER issued a “regulatory sandbox” order-waiving application fees and accelerating approvals; project team (licensee + three vendors) provided open-source SDKs and held quarterly webinars
Outcomes Achieved	<ul style="list-style-type: none"> • Platform deployed in five provinces • 40% faster data reconciliation across TSOs • Eight public SDK forks and integrations

New York REV Demonstration Sandbox

What Was Done	Temporary rule waivers for transactive energy market pilots
How It Was Done	NYPSC granted conditional exemptions from tariff and procurement rules; pilot teams delivered turnkey integration playbooks and three open-source software modules
Outcomes Achieved	<ul style="list-style-type: none"> • Four utilities launched transactive pilot projects • Shared playbooks used by three additional states • Participant satisfaction score of 4.5/5

California PUC DER Sandbox

What Was Done	Exemption from interconnection fee requirements for third-party battery storage aggregators
How It Was Done	CPUC created a DER sandbox allowing fee waivers and expedited interconnection; sandbox participants published technical integration guides and cost-benefit analyses
Outcomes Achieved	<ul style="list-style-type: none"> • 50 MW of aggregated storage tested • Integration guides downloaded 1,200 times • 30% reduction in interconnection timelines

Challenges and Barriers

- Non-regulatory barriers: Many innovations fail to be adopted due to market structures, industry inertia, or insufficient incentives for uptake.
- Short timeframes and uncertain benefits: Making allowances flexible enough to adapt to evolving industry needs while retaining pressure for practical deployment is a balancing act.

- Knowledge transfer and IP: Sharing proprietary learnings while retaining competitive advantages must be managed carefully.

While we have found extensive international examples of regulators promoting innovation either through funding (as Ofgem already does) or through the use of regulatory sandboxes but not of other regulators incentivizing the uptake of innovation through behavioural assessment.

We note that a specific technical assessment could be carried out to match innovations to projects and that expert assessors could determine which previously funded innovations could have been applied to which projects.

What Ofgem could do:

- As Ofgem has a definitive list of innovations funded under these mechanisms, submissions should be assessed based on demonstrating roll-out of innovations from these lists.
- Ofgem will already have data collected on previous rates of roll-out (as it notes that it feels such rates are lower than desired) and can therefore set a baseline against which performance can be assessed.

4 Recommendations

4.1.1 Conclusion on input incentives

Across electricity, gas, water and telecommunications, the empirical record points unambiguously to the effectiveness of input-based incentives in driving delivery cost reduction. These schemes have resulted in sustained productivity growth, substantial cumulative tariff savings for customers, and, in many instances, improvements in service quality. The key to their success lies in the alignment of incentives over multi-year horizons, the symmetry between capital and operating expenditure, and the integration of quality safeguards. Future regulatory innovation should build on this foundation, ensuring that cost efficiency continues to be pursued alongside emerging goals such as resilience, affordability for customers, improved productivity, and decarbonisation. As infrastructure sectors confront the twin challenges of climate change and rapid technological evolution, input-based incentives offer a proven, adaptable tool for delivering affordable, reliable and sustainable services.

There are inherent challenges with panel based evaluations, designing such an evaluation process to deliver the desired outcomes requires adopting certain features.

Ofgem should consider the following in the design of this incentive:

- Set standardised evaluation criteria and scoring rubrics and publish these well in advance, ideally before or very early in the first year of RIIO-T3. It should aim to incentivise behaviour changes from the beginning and because companies internally use predicted incentive performance in business cases, a late set of criteria may miss out on this. It is not sufficient for these to be available with only plenty of time to write the submission since this will incentivise the writing of good submissions but not the underlying behaviours.
- A higher frequency of submissions and judging is better for developing expectations of what good looks like. Annual submissions, accompanied by detailed scoring feedback will drive excellence in behaviour because it will rapidly become clear from the “past papers” what constitutes excellence. For this reason, feedback should be reasonably detailed and published for all TOs where practical. Ofgem will wish to consider the balance between confidentiality and driving performance over time. Evaluating and paying out the incentive annually is likely to driver greater change as the iteration process will rapidly establish a baseline of what good performance looks like.
- Establish a judging panel or set of panels that can evaluate each desired behaviour from a position of real expertise which will include subject matter experts from outside the electricity sector. This may not be the exact same panel for each area.

- Where appropriate, peer review may be useful but this should go beyond the sector. For example, a set of managers from other regulated utilities could judge the supply chain behaviour against a set of defined criteria.

5 Appendix A

Detailed findings of research into reducing the risk of subjectivity in judging panels for incentive funds

1. Case Study: European Research Council (ERC) evaluation panels

The European Research Council (ERC) is a key funding body supporting cutting-edge research across Europe. Its evaluation panels are central to its mission of supporting high-quality research projects. By emphasising diversity, structured evaluation, and continuous improvement, the ERC evaluation panels strive to ensure that the best and most innovative research proposals are funded, thereby promoting scientific excellence. Here's a deeper insight into how these panels operate:

Structure and Composition:

1. **Panels and Disciplines:** The ERC organises its evaluation panels around three main scientific domains: Social Sciences and Humanities (SH), Physical Sciences and Engineering (PE), and Life Sciences (LS). Each domain contains several specific panels that cover a wide range of disciplines.
2. **Diverse Membership:** Panel members are selected for their expertise and experience in their respective fields. The ERC emphasises diversity in terms of nationality, gender, and scientific background to ensure a wide range of perspectives and to minimise biases.

Evaluation Process:

1. **Two-Stage Evaluation:** The ERC employs a two-stage evaluation process for its grants:
 - **Stage 1:** Panel members assess the proposal's scientific excellence based on the written application. They look at the research project's potential impact, the quality of the research team, and the innovative nature of the proposal.
 - **Stage 2:** Shortlisted candidates are invited for interviews. This allows for a more interactive evaluation and provides the panel with an opportunity to explore the proposals in greater depth.
2. **Peer Review:** The panels rely on peer review, where experts in the field review and provide feedback on the proposals. This is complemented by discussions within the panel to ensure a comprehensive evaluation.

Avoiding Groupthink:

1. **Independent Reviews:** Before panel meetings, each proposal is independently reviewed by multiple panel members. This approach prevents initial discussions from being dominated by a single viewpoint.
2. **Structured Discussions:** Panel meetings are structured to ensure that each proposal receives a balanced and thorough discussion. Panel chairs guide the deliberations to ensure all voices are heard.
3. **Feedback and Reflection:** After each evaluation cycle, the ERC collects feedback from panel members to refine and improve the process. This continuous improvement helps maintain the integrity and effectiveness of the evaluation.

Transparency and Accountability:

1. **Clear Criteria:** The ERC provides clear evaluation criteria and guidelines, ensuring that all proposals are judged fairly and consistently.
2. **Feedback to Applicants:** After the evaluation process, applicants receive feedback on their proposals. This transparency helps applicants understand the decision-making process and the areas for improvement.

2. Case Study: Canada Council for the Arts evaluation panels

The Canada Council for the Arts is Canada's national arts funding body, responsible for supporting the development of Canadian artists, organisations, and projects. Its grant evaluation process is designed to ensure fair and transparent decision-making while avoiding groupthink and encouraging diverse perspectives. It has developed a robust and inclusive evaluation process that prioritises fairness, transparency, and diversity.

Structure and Composition

1. **Peer Assessment Model:** The Canada Council uses a peer assessment process to evaluate grant applications. This means that panels are composed of artists, cultural workers, and experts from the relevant fields who understand the realities and challenges of the arts sector.
2. **Diversity of Assessors:** The Council prioritises diversity in panel composition, ensuring representation across different genders, cultural backgrounds (including Indigenous representation), regions, disciplines, and artistic practices. This diversity helps ensure that a variety of perspectives are brought to the table.
3. **Panel Size:** Depending on the program and the number of applications, panels typically include three to seven members for a balanced discussion.

Evaluation Process

1. **Independent Review:** Before panel meetings, each member independently reviews the applications assigned to them. They assess applications against established criteria, such as artistic merit, impact, and feasibility, without influence from other panel members.
2. **Panel Meetings:** After conducting individual reviews, panel members convene to discuss applications in detail. During these meetings:
 - Members share their insights and perspectives.
 - The chair or facilitator ensures balanced participation and keeps discussions focused.
 - Consensus is reached through thorough deliberation, but voting may be used if necessary.
3. **Criteria-Based Judgement:** Applications are assessed against clear and transparent criteria, which typically include:
 - Artistic Merit: The quality and originality of the artistic work or proposed project.
 - Impact: The potential effect of the project on audiences, communities, or the field.
 - Feasibility: The practicality and financial soundness of the proposed plan.

Avoiding Groupthink

1. **Diverse Representation:** By ensuring panels are composed of individuals from different cultural, geographic, and artistic backgrounds, the Council minimises the risk of homogeneity in opinions.
2. **Independent Assessments:** Requiring assessors to review applications individually before group discussions prevents dominant voices from influencing initial impressions.
3. **Facilitated Discussions:** Panel meetings are guided by a chair or facilitator who ensures all members have an equal opportunity to speak and challenge ideas. This structure fosters open dialogue and reduces the likelihood of rubber-stamp decisions.
4. **Confidentiality and Neutrality:** Panel members must adhere to strict confidentiality rules and declare conflicts of interest. This ensures that decisions are made objectively and without undue external influence.

Transparency and Accountability

1. **Clear Guidelines for Applicants:** The Canada Council publishes detailed information about its funding programs, including eligibility requirements, evaluation criteria, and decision-making processes. This transparency ensures applicants understand how their proposals will be judged.
2. **Feedback for Applicants:** While decisions are final, applicants can request feedback to understand how their proposals were evaluated. This fosters trust and provides constructive insights for improvement.
3. **Continuous Improvement:** The Canada Council regularly reviews its programs and processes, incorporating feedback from panel members and stakeholders to refine its methods.

3. Case Study: Nobel Prize Committees

The Nobel Prize Committees are renowned for their rigorous and impartial evaluation processes aimed at identifying individuals or organisations whose achievements have profoundly impacted humanity. They have developed a robust and highly respected evaluation process that prioritises fairness, independence, and excellence. Their emphasis on diversity in expertise, external consultation, and structured debate helps mitigate groupthink and ensures that laureates are chosen based on their true contributions to humanity. Here is a deeper insight into how these committees work and avoid groupthink in their decision-making:

Structure and Composition

1. **Separate Committees for Each Prize:** There are distinct committees for each Nobel Prize category (Physics, Chemistry, Medicine/Physiology, Literature, Peace, and Economic Sciences). Each committee is composed of experts in the relevant field.
2. **Expert Membership:** Members of the committees are typically leading scholars, scientists, or practitioners in their respective fields. For example:
 - The **Science Prizes** (Physics, Chemistry, Medicine) are evaluated by committees of the Royal Swedish Academy of Sciences.
 - The **Literature Prize** is evaluated by the Swedish Academy.
 - The **Peace Prize** is awarded by a committee selected by the Norwegian Nobel Committee.
3. **Diversity in Expertise:** Members are selected to represent a broad range of expertise within their discipline. The committees also consult external experts to ensure diverse perspectives and avoid blind spots in evaluation.

Evaluation Process

1. **Nomination Process:**
 - Nominations are submitted by qualified individuals or organisations, such as previous laureates, university professors, and members of academies.
 - Self-nominations are not allowed, and the nomination process is confidential to ensure independence.
2. **Independent Review:**
 - Committee members independently review nominations and supporting materials (research papers, achievements, etc.).
 - External experts may be consulted to provide additional insights, ensuring a broader perspective and reducing the risk of insular thinking.
3. **Deliberation:**
 - The committees convene to discuss the nominations in depth.
 - Discussions are structured and guided by the chairperson to allow for thorough analysis of each candidate's merits.
 - Members are encouraged to critically evaluate each nominee, considering their impact and significance to the field or humanity.
4. **Consensus Building:**
 - While the goal is to reach consensus, disagreement and debate are welcomed as part of the process.
 - If consensus cannot be reached, voting may occur to finalise the decision.

Avoiding Groupthink

1. **Independent Assessments:** Before group discussions, committee members conduct independent evaluations of the nominees. This prevents initial opinions from being influenced by dominant voices in the group.
2. **Consultation with External Experts:** Committees regularly seek advice from external experts in the field. These external perspectives provide fresh insights and reduce the risk of insular thinking.
3. **Confidentiality:** The Nobel Prize deliberations are highly confidential, preventing external pressures or lobbying that could influence decisions.
4. **Structured Debate:** Discussions within the committees are carefully structured to ensure all members have an opportunity to voice their opinions. Chairs are responsible for maintaining balance and encouraging critical dialogue.
5. **Diversity of Perspectives:** While committee members are experts, their diversity in specialties within the field ensures that decisions are not dominated by narrow viewpoints.

Transparency and Accountability

1. **Clear Criteria:** Each prize has specific criteria for evaluation. For example:
 - The Science Prizes focus on discoveries that have made significant contributions to the field.
 - The Literature Prize emphasises the lifetime work of authors who have produced outstanding contributions.
 - The Peace Prize recognises efforts to promote peace and resolve conflict.
2. **Historical Records:** After 50 years, the Nobel Committees release records of their deliberations to the public. This transparency demonstrates their commitment to integrity and allows for historical scrutiny of decisions.

6 Appendix B

Detailed research into alternatives to panels for evaluating incentive awards

Some regulated industries have explored practical alternatives to traditional panels for evaluating innovation incentive awards. While panels consisting of experts or stakeholders remain a common method, alternatives have emerged to address concerns such as bias, inefficiency, or lack of scalability. These alternatives often leverage technology, data-driven approaches, or participatory methods to improve the evaluation process. Here are a few examples:

Approach	How It Works	Benefits	Example	Specific Example
Crowdsourcing and Open Innovation Platforms	Industries use online platforms to gather input from a broader audience, including employees, customers, or external innovators, to evaluate and vote on ideas.	<ul style="list-style-type: none"> Encourages diverse perspectives and engagement beyond a small panel. Reduces bias by involving larger, more representative groups. Scales easily for industries with many submissions or participants. 	Some energy regulators have experimented with open innovation platforms to evaluate solutions for sustainability challenges.	Industry: Energy Country: United Kingdom Example: Ofgem launched the Energy Innovation Link, a platform allowing innovators to submit ideas for improving energy systems, with feedback from stakeholders. Outcome: Increased participation from smaller innovators, faster identification of impactful ideas, and effective funding allocation.
Data-Driven and Algorithmic Evaluation	Submissions for awards are assessed using pre-defined metrics, algorithms, or scoring systems that analyse data objectively (e.g., financial impact, scalability, environmental benefits).	<ul style="list-style-type: none"> Reduces human bias by focusing on measurable criteria. Streamlines evaluation for large numbers of submissions. Can integrate machine learning to predict long-term impact or feasibility. 	In the pharmaceutical industry, innovation awards are assessed based on clinical trial data or AI-driven models predicting outcomes.	Industry: Pharmaceuticals Country: United States Example: The FDA partnered with AI firms to evaluate clinical trial innovation. Submissions were scored using metrics like potential patient outcomes and scalability. Outcome: Faster evaluations, identification of impactful innovations, and integration of AI into decision-making.
Peer Review Networks	Participants in the industry (e.g., innovators, researchers, or practitioners) evaluate each other's submissions anonymously or semi-anonymously.	<ul style="list-style-type: none"> Promotes collaboration and knowledge-sharing within the industry. Reduces reliance on centralised panels. Leverages domain expertise from a wide pool of reviewers. 	The healthcare sector uses peer review for awards in medical innovation.	Industry: Healthcare Country: Canada Example: The CIHR used peer review networks to evaluate funding proposals for medical innovation. Outcome: Fostered collaboration, improved proposal quality, and reduced bias through anonymous reviews.
Gamification and Simulation-Based Approaches	Submissions are evaluated through simulated real-world scenarios or gamified challenges, where the effectiveness of ideas can be tested in practice.	<ul style="list-style-type: none"> Provides a dynamic way to test ideas without relying solely on theoretical reviews. Reveals practical implications and the viability of innovation. 	In the defence industry, awards may be based on performance in simulated combat environments.	Industry: Defence Country: United States Example: DARPA's "Subterranean Challenge" evaluated robotic solutions for underground operations through simulated challenges. Outcome: Identified scalable solutions for military/rescue operations and attracted global innovators.
Stakeholder Voting Systems	Stakeholders (e.g., customers, employees, or community members) are invited to vote or rank submissions, often using digital platforms.	<ul style="list-style-type: none"> Involves end users or beneficiaries in the evaluation process. Enhances transparency and builds trust in the award process. 	Utilities in the energy sector use stakeholder voting to identify impactful renewable energy projects.	Industry: Utilities (Energy) Country: Australia Example: ARENA's "A-Lab Innovation Challenge" included public voting to choose ideas for renewable energy integration. Outcome: Engaged the public, identified ideas aligned with stakeholder needs, and strengthened relationships between providers and communities.
Hybrid Approaches	Combines panels with one or more of the alternatives above (e.g., a panel makes the final decision after crowdsourcing or algorithmic evaluation narrows submissions).	<ul style="list-style-type: none"> Balances human expertise and technological efficiency. Allows for scalability while maintaining oversight. 	Regulatory agencies in telecom may use scoring systems to shortlist candidates and panels for final decisions.	Industry: Telecommunications Country: European Union Example: The Horizon 2020 program funded telecom innovation by first scoring applications algorithmically and then using an expert panel for final decisions. Outcome: Balanced speed and expertise, improved funding consistency, and increased diversity by including smaller innovators.

7 Appendix C

Examples of how FERC (Federal Energy Regulatory Commission), EPA (Environmental Protection Agency), and FCC (Federal Communications Commission) have approached the use of ex-ante targets to drive behaviours

Regulator	Focus Areas	Examples of Ex-Ante Targets	Challenges in Setting Targets	Solutions to Challenges	Key Strategies
FERC	<ul style="list-style-type: none"> Grid modernisation Renewable energy integration Operational efficiency 	<ul style="list-style-type: none"> Transmission Incentive Policies: Incentives for projects improving reliability or enabling renewable energy integration. Order No. 1000: Mandates regional transmission planning. Performance-Based Regulation (PBR): Targets for cost reductions and reliability improvements. 	<ul style="list-style-type: none"> Counterfactual Challenge: Estimating baseline investment trends without incentives. Identifying gaps in planning or performance improvements absent intervention. 	<ul style="list-style-type: none"> Benchmarking: Use historical spending data and industry comparisons. Stakeholder consultations and cost-benefit analyses. Independent reviews to validate assumptions. 	<ul style="list-style-type: none"> Data-driven benchmarking. Stakeholder engagement. Transparent methodologies. Independent evaluations.
EPA	<ul style="list-style-type: none"> Emission reductions Resource conservation Technology adoption 	<ul style="list-style-type: none"> Clean Air Act Standards: Ex-ante targets for emissions reductions based on achievable technological improvements. Renewable Fuel Standard (RFS): Targets for renewable fuel blending in transportation fuels. Water Quality Standards: Reducing contaminants in water systems. 	<ul style="list-style-type: none"> Counterfactual Challenge: Calculating baseline emissions trends without regulations. Estimating costs and effectiveness of water treatment improvements without EPA intervention. 	<ul style="list-style-type: none"> Scientific Models: Predict baseline trends and outcomes. Conduct lifecycle analyses for full impact assessments. Stakeholder feedback to refine targets and assumptions. 	<ul style="list-style-type: none"> Use of scientific models. Lifecycle assessments. Stakeholder engagement. Transparent methodologies.
FCC	<ul style="list-style-type: none"> Broadband rollout Service quality improvements Spectrum management 	<ul style="list-style-type: none"> Universal Service Fund (USF) Programmes: Targets for broadband deployment in underserved areas. Broadband Speed Targets: Minimum speed requirements to ensure meaningful improvements. Spectrum Auctions with Performance Requirements: Coverage obligations for wireless service providers. 	<ul style="list-style-type: none"> Counterfactual Challenge: Estimating baseline broadband deployment and speed improvements absent regulation. Determining spectrum usage without performance requirements. 	<ul style="list-style-type: none"> Cost Models: Geographic and demographic data to estimate deployment costs. International benchmarking for speed and coverage targets. Stakeholder input to refine targets. 	<ul style="list-style-type: none"> Use of cost models. International benchmarking. Stakeholder feedback. Transparent methodologies.

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