Co-sponsored by

ICG Infrastructure Client Group

National Infrastructure & Service Transformation Authority

The Green Construction Board

Delivered by

Built Environment Connective



Electricity Transmission Partnership

This is one of 15 case studies informing the Infrastructure Systems Review.

System: Transmission delivery ecosystem.

Systems contribution and value: Employed long-term portfolio partnering, performance-linked future work and multi-level governance, with the aim of reducing delivery fragmentation and bottleneck risk, and supporting investment in delivery capacity, capability and resilience.

Authors
Emma Langman-Maher
Donna Nobes

Contributors
Keren Bartlett
John Beckford
Abi Howells
Phil Mccann
Alex Munslow

Summary

The Electricity Transmission Partnership (ETP) is National Grid Electricity Transmission's £8 billion delivery model for accelerating substation infrastructure across England and Wales. It is expected to support around 130 substation projects and forms part of the wider RIIO-T3 investment programme to modernise the electricity transmission network and support the clean energy transition.

This case study considers a nested system. The wider system is the transmission network, because its performance affects clean power, energy security, economic growth, resilience, connection access and long-term consumer value. Within that, the ETP is a system intervention: it changes the commercial, organisational and behavioural arrangements through which National Grid expands substation infrastructure.

The case study examines how changing the delivery ecosystem can improve the transmission system's ability to deliver wider public outcomes.

The ETP moves away from shorter-term, project-by-project procurement towards long-term regional and national partnerships, performance-linked access to future work, co-creation, systems-based governance and partner growth and investment planning. Its value lies in strengthening delivery capacity, delivery-partner and supply-chain confidence, workforce planning, regional capability, portfolio learning and integration with adjacent delivery routes.

The case study shows that better outcomes per pound may come not only from better asset design, but from changing the delivery system that enables the physical network to be built at the scale and pace required.

Scope

The case study focuses on the ETP as a delivery-system intervention within the wider electricity transmission system. The scope draws four boundaris:

- Geographic – England and Wales, where National Grid Electricity Transmission owns and maintains the transmission network.
- Technical – primarily substation infrastructure, recognising that substations are critical nodes connected to overhead lines, underground cables, generation, storage, demand growth and distribution networks.
- Delivery – National Grid, regional delivery partners, national partners, the wider supply chain, workforce capability, long-lead items, commissioning capacity, governance and behavioural expectations. 'Connection customers' means generation, storage and demand projects seeking access to the transmission system. 'Delivery partners' and 'supply chain' mean organisations involved in designing, building, commissioning and supporting ETP substation infrastructure.
- Wider organisational – including Ofgem, NESO, government, local authorities, connection customers, communities and consumers. Adjacent delivery vehicles and asset routes matter where they interact with the ETP's behaviours, governance and resource requirements, especially where they compete for limited skilled labour, long-lead items and specialist capability.

The case study shows that better outcomes per pound may come not only from better asset design, but from changing the delivery system that enables the physical network to be built at the scale and pace required.

The case study proceeds from the current policy and regulatory context in which additional transmission capacity is required to support clean power, electrification, energy security, resilience and growth. It does not test the legitimacy of that national direction, nor compare the ETP in detail with alternatives such as distributed local generation or a wholly National Grid-owned delivery model.

It assumes public benefit where transmission investment enables lower avoidable constraint costs, faster connection of clean generation and demand, reliable system access, regional economic activity and long-term consumer value.

Outcomes

The desired outcome is a transmission network that can support clean power, net zero, energy security, economic growth, electrification, resilience and long-term value for consumers.

For National Grid and the wider energy system, this means greater transfer capacity, maintained reliability, faster and more reliable connections, and improved connection capacity and access for clean generation, storage and major demand.

For consumers and society, it means lower avoidable constraint costs, more resilient energy infrastructure, support for economic growth and a stronger platform for decarbonisation.

The gap in the current system is not only a physical capacity gap. It is also a delivery capacity gap. Connection customers (including generation, storage and major demand projects, such as data centres) want and expect timely access to the grid. Communities experience uncertainty about the design, timing, delivery and impacts of future infrastructure. Delivery partners and the wider supply chain face fragmented pipelines that make it harder to invest in people, plant, equipment and specialist capability. Workers experience unstable or highly mobile employment patterns, including long-distance travel and time away from home. The wider environment is affected when clean generation cannot be connected or must be constrained because the network has insufficient capacity.

The evidence base for systems change Electricity Transmission Partnership



The challenge is to deliver £8 billion of new substations against a backdrop of supply chain constraints, and achieve strongly positive economic, social and environmental outcomes while doing it.

The ETP is intended to improve outcomes by creating a more capable delivery ecosystem for substation infrastructure. The direct output is delivery of a portfolio of substation projects. The additional systems value comes from how that portfolio is organised: long-term regional and national partnerships, sustained portfolio visibility, performance-linked access to future work, co-creation, behavioural governance and growth, and investment planning.

The ETP is expected to improve outcomes at several levels.

At the transmission-service level, it strengthens the delivery route for infrastructure that enables capacity, reliability, system access and future connection capability.

At the public-outcome level, it supports clean power, net zero, energy security, economic growth, resilience and long-term consumer value by helping the network keep pace with changing generation and demand.

At the delivery-system level, it seeks to reduce fragmentation, repeated mobilisation, inefficient sequencing and reactive procurement of scarce capability.

The model is also intended to improve integration between National Grid, regional partners, national partners, the wider supply chain and adjacent delivery routes.

These changes matter because the value of the ETP is not only the delivery of individual substation projects. Its wider value is the creation of a more predictable and capable delivery ecosystem for the transmission programme. Greater certainty over future workload will lead to stronger supply chain confidence, better regional capability, clearer accountabilities, better portfolio learning and improved conditions for investment in skills, equipment and capacity.

The ETP is still new, so final outturn evidence on cost, schedule, productivity, quality, safety, carbon, wellbeing and service performance is not yet available. The authors' case therefore makes a forward-looking but bounded claim: the ETP is a systems-oriented enabling mechanism for efficiently and effectively delivering the substation element of the wider RIIO-T3 investment programme, not yet a fully proven source of quantified benefits.

Systems

Electricity transmission should be understood as a system of systems.

The physical system includes substations, circuits, transformers, overhead lines, underground cables, generation, storage and demand connections.

The intended outputs are a more organised, scalable and resilient delivery system: faster mobilisation, reduced procurement fragmentation, stronger delivery-partner and supply-chain confidence, improved regional coordination, better portfolio learning and clearer performance accountability.

The delivery system includes National Grid, regional delivery partners, national partners, the wider supply chain, workforce capability, long-lead items, construction sequencing and commissioning expertise.

The governance and economic system includes the RIIO-T3 regulatory framework, Ofgem's role as economic regulator, NESO's role in whole-system planning and operation, commercial models, procurement rules, performance measures, consumer bills and delivery-partner investment decisions.

The information system includes network planning, project sequencing, supply chain visibility, performance reporting, behavioural insight and regional business planning.

The logic that has made this work begins with the outcomes the transmission system is expected to support, then works backwards to identify the conditions needed to deliver those outcomes. This distinguishes between the physical electricity system, the delivery ecosystem, the commercial and governance system, and the outcome system experienced by connection customers, consumers, communities, workers and the wider economy.

This perspective identifies delivery capacity as a binding system constraint. Network expansion depends not only on asset design, planning consent or regulatory funding approval, but on whether the delivery ecosystem has the confidence, capability, incentives and coordination required to build complex infrastructure at pace. The ETP is not operating in isolation: adjacent electricity delivery routes and other sectors draw on many of the same specialist skills, long-lead items, commissioning resources and delivery partners. The mobilisation of the ETP has occurred alongside wider industry reforms, demonstrating the importance of delivery models that can adapt to external change while maintaining delivery momentum.

The identification of procurement and commercial strategy as a leverage point was not retrospective. National Grid created a dedicated task force, later formalised as a procurement strategy team, to examine how the delivery model needed to change. The task force considered the problem through a systems lens: not simply how to procure substation works, but how to create the capacity, confidence, behaviours and investment conditions needed across a constrained delivery market. Its separation from normal office arrangements was a practical and symbolic choice, creating space to step outside business-as-usual processes.

The same systems logic shaped governance and assurance. Regional ETP boards act as coaching forums for projects, helping them surface risks, improve decisions and resolve issues earlier. The national ETP board acts as a coaching supervisor to those regional boards, while also identifying matters to address once across the portfolio. This creates a route for system-wide learning, such as standardising lower-carbon and more efficient solutions, or designing out safety concerns across all relevant projects.

Interventions

The core intervention was the creation of the ETP as a new delivery model for substation infrastructure. It is a combined commercial, organisational, governance, capability and behavioural intervention whose purpose is to strengthen the system's ability to deliver infrastructure at scale and pace.

National Grid appointed regional delivery partners to support substation delivery across defined areas, with national partners providing additional capacity and resilience. The partners were already part of a National Grid framework, with the change made contractually through a deed of variation. The model is being operationalised through long-term partnering, co-creation, systems-based governance, behavioural change, and growth and investment plans. It draws on Project 13 principles, which promote enterprise-based delivery: long-term, integrated relationships focused on whole-life outcomes rather than transactional, project-by-project contracting.

The ETP also changes governance and assurance. Regional ETP boards support projects through a coaching role. The national ETP board supports the regional boards and addresses issues that cut across the whole portfolio, allowing common risks, opportunities and design choices to be dealt with once and then applied repeatedly. This acts as a learning system, allowing system-wide improvement.

The intended outputs are a more organised, scalable and resilient delivery system: faster mobilisation, reduced procurement fragmentation, stronger delivery-partner and supply-chain confidence, improved regional coordination, better portfolio learning and clearer performance accountability.

The intervention differs from conventional practice because it treats the portfolio as a connected delivery system requiring long-term capacity, aligned incentives, shared behaviours, active learning and portfolio-level assurance. Realising the full benefits of the model will require enterprise behaviours to be consistently embedded throughout participating organisations. While strategic alignment has been quickly established at leadership level, long-term success depends on translating those principles into day-to-day decision-making, behaviours and relationships – an area that continues to be developed as the model matures.

The evidence base for systems change Electricity Transmission Partnership



Network expansion depends not only on asset design, planning consent or regulatory funding approval, but on whether the delivery ecosystem has the confidence, capability, incentives and coordination required to build complex infrastructure at pace.

The ETP delivery system

Working backwards from outcomes to the conditions needed to deliver them

Wider public outcomes

Clean power and net zero | Energy security | Growth | Resilience | Long-term consumer value

Enabled by

Electricity transmission system performance

Capacity and reliability | Faster connection access for generation, storage and demand
Reduced avoidable constraint costs

Depends on

Substation infrastructure delivered at scale and pace

£8bn delivery model; around 130 expected projects | Long-lead items | Skilled workforce
Construction sequencing | Commissioning | England and Wales | Part of RIIO-T3

Shaped by

ETP delivery-system intervention

Long-term regional delivery partners and national partners | Growth and investment plans
"Yours to lose" model: performance-linked future work | Co-creation

Changes

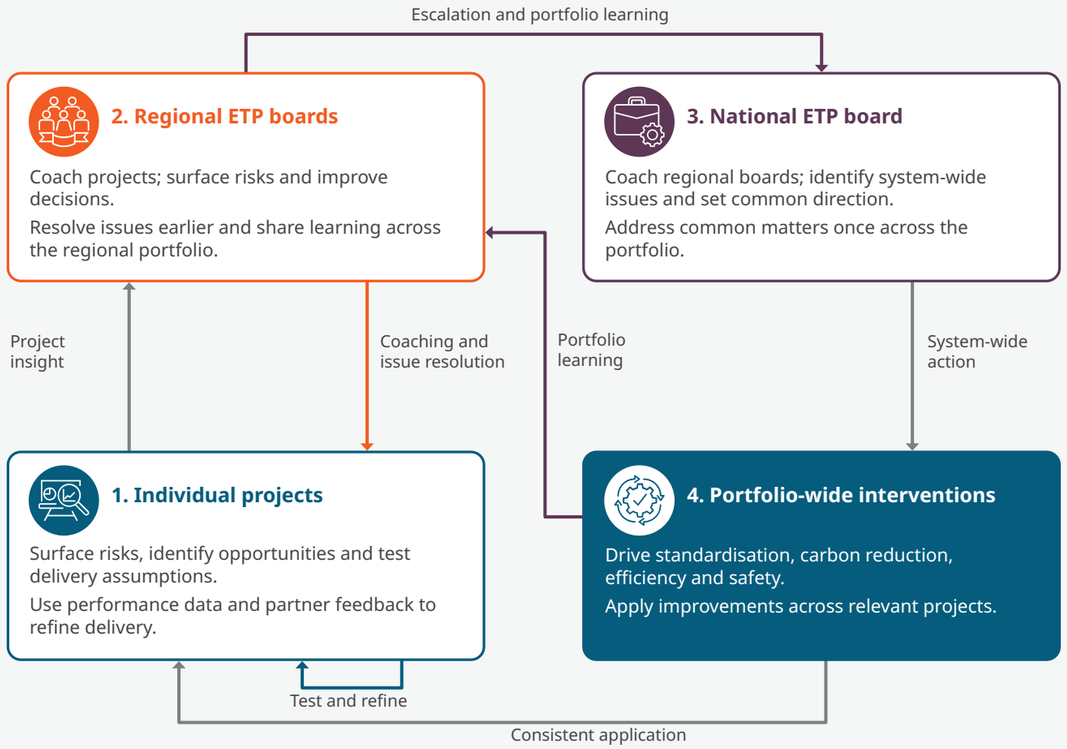
Delivery ecosystem conditions

Pipeline certainty | Delivery partner and supply-chain confidence | Workforce investment
Regional capability | Portfolio learning | Collaborative behaviours

Intended enabling logic; final outturn evidence is still developing.

ETP governance, assurance and portfolio learning

Coaching and learning connect project, regional and national decisions



Learning informs plans, decisions and interventions as the model matures.

Economic assessment

The economic baseline is a constrained delivery environment. The UK needs to expand electricity transmission capacity at a scale and pace that traditional, project-by-project delivery models were not designed to support. The economic question is therefore not only whether the ETP delivers individual projects more efficiently. It is whether the required infrastructure can be delivered at all without a more systemic approach to capacity, sequencing, supply chain confidence and workforce investment.

The value case should be read at two levels.

Project level: The ETP is expected to improve efficiency by reducing repeated procurement effort, remobilisation, duplication, sequencing problems and reactive procurement of long-lead items or scarce commissioning capability. Expected benefits include better supplier productivity, stronger workforce planning, improved use of regional delivery capacity, reduced interface friction and lower risk of delays across related projects. These benefits should be tracked through cost, schedule, quality, safety, productivity, carbon, workforce, supplier-performance and change-control measures.

System level: The more important question is whether the ETP improves the transmission system's ability to deliver the outcomes for which investment is being made. These include greater transfer capacity, faster connection of generation, storage and demand, maintained reliability, reduced constraint costs, resilience, clean power and long-term consumer value.

This distinction matters because a delivery model could improve project efficiency without materially improving system outcomes. Conversely, a delivery-system intervention may create high system value by reducing the risk that the wider RIIO-T3 programme becomes undeliverable, even before all benefits are visible in individual project outturn data.

This is the ETP's main enabled system value. It strengthens the delivery ecosystem needed to build the physical electricity system. That value is seen in improved deliverability, reduced risk of bottlenecks, better supply chain readiness and greater confidence that the wider investment programme can be delivered.

The avoided-cost logic is also important. Where transmission capacity is delayed, costs can arise elsewhere through

The evidence base for systems change Electricity Transmission Partnership

The economic question is not only whether the ETP delivers individual projects more efficiently. It is whether the required infrastructure can be delivered at all without a more systemic approach to capacity, sequencing, supply chain confidence and workforce investment.

constraint costs, delayed connections, inefficient system operation and weaker conditions for growth sectors that depend on reliable electricity capacity.

The ETP may also improve long-term value by changing supplier investment behaviour. A clearer pipeline and more stable relationship model should make it easier for partners to invest in people, skills, equipment, regional capability and innovation. It may also reduce social and environmental costs associated with unstable delivery patterns, including excessive travel, workforce disruption and inefficient mobilisation.

At this stage, there is not yet public outturn evidence showing quantified cost savings directly attributable to the ETP. The current evidence base supports a strong forward-looking economic logic, but final value-for-money evidence will depend on tracking cost, time, productivity, quality, safety, workforce, carbon, wellbeing, service performance, connection outcomes and constraint-cost impacts as the programme matures.

Systemic assessment

The ETP demonstrates that infrastructure delivery capacity can itself become a national system constraint. Clean power is not limited only by technology, finance or policy. It also depends on whether the market has the skills, supply chain confidence, governance, incentives and delivery capacity to build complex infrastructure at pace.

The main systemic inefficiencies addressed by the ETP are short-term procurement horizons, fragmented project pipelines, limited delivery-partner confidence to invest ahead of demand, competition for scarce technical skills, weak visibility across interdependent projects, and the risk that each substation is treated as a separate transaction rather than part of a connected programme.

The model appears strongest where outcomes, authority and incentives are aligned. National Grid has used its role as infrastructure client to give the supply chain clearer long-term demand signals, link future work to performance, and create governance arrangements that encourage collaboration rather than repeated transactional procurement. If incentives reward local optimisation, the wider system suffers. If they reward capacity growth, collaboration, delivery certainty and whole-system value, they can change system behaviour.

The main evidence gap is whether that logic will translate into measured performance over time. The ETP is still in its infancy. The key test will be whether learning mechanisms, behavioural insights, performance data and partner feedback lead to changes in plans, decisions and interventions as the programme matures. The immediate transferable lesson is that major infrastructure clients can use commercial design, governance and sustained pipeline visibility as levers for changing delivery-system behaviour and encouraging long-term investment across the delivery ecosystem.

Recommendations

Major infrastructure programmes should treat delivery capacity as a strategic system constraint, not simply as a procurement issue. Where the market needs confidence to invest in people, skills, equipment and regional capability, government, regulators and infrastructure clients should consider long-term portfolio partnerships rather than relying only on project-by-project contracting.

Procurement and commercial models should be designed as system levers. They should align incentives with whole-system outcomes, not only individual project cost and schedule. Performance-linked access to future work can support quality, safety, productivity, collaboration, innovation and capacity growth, provided that measures are transparent and linked to public value.

Benefits should be measured at both project and system level. For the ETP, project-level measures should include cost, schedule, quality, safety, productivity, carbon, workforce stability and supplier performance. System-level measures should include transmission capacity enabled, connection outcomes, avoided constraint costs, delivery bottlenecks reduced, supply chain investment, regional capability, integration with adjacent delivery routes, customer outcomes and consumer value.

National Grid should publish lessons from the ETP as delivery progresses, including what works and what does not. Particular attention should be given to regionalisation, growth and investment plans, partner incentives, behavioural governance, portfolio learning and alignment with other delivery strategies within its strategic procurement approach.

Other sectors should test whether fragmented procurement is limiting their ability to deliver system-level outcomes, particularly where long-term delivery capacity is a binding constraint. This is likely to be relevant to other network-based infrastructure sectors, including water, rail, flood resilience, heat networks and large-scale retrofit.

Co-sponsored by

The Infrastructure Client Group brings together UK economic infrastructure clients in partnership with government and industry. The ICG's key purpose is to lead the acceleration of improvement and alignment in the delivery and development of UK infrastructure, for the benefit of society, the economy and the environment. It is sponsored by the Institution of Civil Engineers.
bit.ly/ICG_01

The National Infrastructure and Service Transformation Authority unites long-term strategy with best practice project delivery, to transform the performance of UK major projects and programmes. It gives ministers the levers they need to drive growth. NISTA is a joint unit at the heart of government, reporting to both HM Treasury and Cabinet Office.
bit.ly/NISTA_01

The Green Construction Board is the sustainability arm of the Construction Leadership Council. It brings together government and industry to drive net zero, biodiversity enhancement and resource efficiency across the built environment, helping shape policy and industry practice.
bit.ly/GCB_01

Delivered by

The Built Environment Connective is a public good organisation that brings people together to turn systems thinking into coordinated, lasting change. It connects system thinkers across government, industry, academia and civil society.
be-connective.com

Supported by

The Institution of Civil Engineers (ICE) is the home of infrastructure. It is a professional institution with 95,000 members and over 200 years of history. It qualifies civil and infrastructure engineers, promotes lifelong learning, and provides trusted, impartial, expert advice to decision makers. Its vision is a world where infrastructure enables people and planet to thrive. Its global membership designs, builds, and maintains trustworthy and sustainable infrastructure.
ice.org.uk