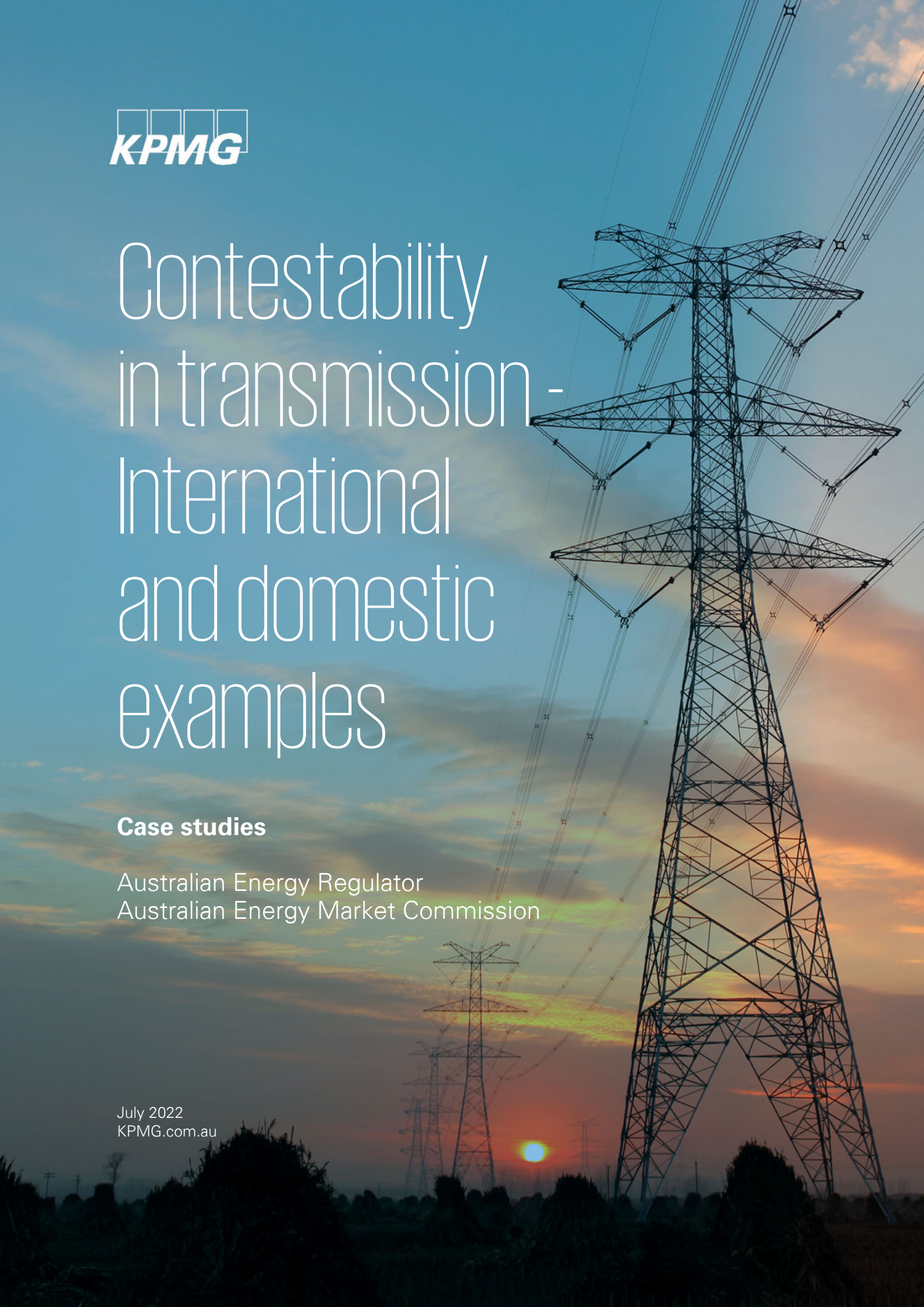

Contestability in transmission - International and domestic examples

Case studies

Australian Energy Regulator
Australian Energy Market Commission

July 2022
KPMG.com.au

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In preparing this report, we have had access to information provided by AER and AEMC and its specialist advisors, information provided by AER and AEMC that has been prepared by third parties, and publicly available information. We have relied upon the truth, accuracy and completeness of any information provided or made available to us in connection with the Services without independently verifying it.

Any findings or recommendations contained within this report are based upon our reasonable professional judgement based on the information that is available from the sources indicated. Should the project elements, external factors and assumptions change then the findings and recommendations contained in this report may no longer be appropriate. Accordingly, we do not confirm, underwrite or guarantee that the outcomes referred to in this report will be achieved.

We do not make any statement as to whether any forecasts or projections will be achieved, or whether the assumptions and data underlying any such prospective financial information are accurate, complete or reasonable. We will not warrant or guarantee the achievement of any such forecasts or projections. There will usually be differences between forecast or projected and actual results, because events and circumstances frequently do not occur as expected or predicted, and those differences may be material.

Our reporting date corresponds with a period of significant volatility in global financial markets and widespread macro-economic uncertainty and an energy market in transition. In light of the emergence and spread of COVID-19, this volatility and uncertainty could persist for some time. The assumptions set out in our report will need to be reviewed and revised to reflect any changes which emerge as a result of COVID-19. As a result of the continued uncertainty in relation to the impact of COVID-19, our work may not have identified, or reliably quantified the impact of, all such uncertainties and implications. If the assumptions provided by AER and AEMC on which this report is based are subsequently shown to be incorrect or incomplete, this could have the effect of changing the findings set out in this report and these changes could be material. We are under no obligation to amend our report for any subsequent event or new information.

Final report

The following final report has been prepared on the basis of our work carried out up to 22 June 2022.

Glossary of Terms

Term	Description
(NG)ESO	(National Grid) Electricity System Operator
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
ANOPR	Advance Notice of Proposed Rulemaking
B/C	Benefit-to-cost
CAPEX	Capital expenditure
CATO	Competitively Appointed Transmission Owner
CBA	Cost-Benefit Analysis
CEI	Call for Expressions of Interest
CEPA	Cambridge Economic Policy Associates
CNN	Certificate of Convenience and Necessity
CREZ	Competitive Renewable Energy Zone
DND	Detailed Network Design Phase
DTSO	Declared Transmission System Operator
EII Act	Electricity Infrastructure Investment Act
ENA	Energy Networks Australia
EPQ	Enhanced Pre-Qualification
FERC	Federal Regulatory Energy Commission
FES	Future Energy Scenarios
FTV	Final Transfer Value
IAE	Income Adjusting Event
InTV	Initial Transfer Value
ISO	Independent System Operator
ISO-NE	ISO New England
ITT	Invitation to Tender
ITV	Indicative Transfer Value
kV	Kilovolt
LAC	Local Access Charge
LOTI	Large Onshore Transmission Investments
m	Million

Term	Description
MISO	Midcontinent ISO
MVP	Multi-Value Projects
NAP	Network Access Policy
NEM	National Electricity Market
NER	National Electricity Rules
NETSO	National Electricity Transmission System Operator
NITS	Network Integration Transmission Charges
NGET	National Grid Electricity Transmission in England and Wales
NOA	Network Options Assessment
NYISO	New York ISO
NYPSC	New York Public Service Commission
OATT	Open Access Transmission Tariffs
Ofgem	Office of Gas and Electricity Markets
OFTO	Offshore Transmission Owner
OP	Outline Proposal
PB	Preferred Bidder
PJM	Pennsylvania, New Jersey, and Maryland
PPWCA	Preliminary Works Cost Assessment
PPTN	Public Policy Transmission Need
PSE&G	Public Service Enterprise Group
QTT	Qualification to Tender
RAC	Regional Access Charge
RCV	Regulatory Capital Value
REZ	Renewable Energy Zone
RFP	Request For Proposal
RIT-T	Regulatory Investment Test for Transmission
RM	Rulemaking
RoE	Return on Equity
ROFR	Right Of First Refusal
RTEP	Regional Transmission Expansion Plan
RTO	Regional Transmission Owner
SB	Successful Bidder
SPT	Scottish Power Transmission
SPV	Special Purpose Vehicles

Term	Description
SSEN	Scottish and Southern Electricity Networks
TET	Transmission Efficiency Test
TNSP/TSP	Transmission (Network) Service Provider
TUoS	Transmission Use of System
TO	Transmission Owner
TR	Tender Round
TRR	Transmission Revenue Requirement
TRS	Tender Revenue Stream
WACC	Weighted Average Cost of Capital

Contents

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Introduction

This report supplements the main report developed for the Australian Energy Regulator (**AER**) and Australian Energy Market Commission (**AEMC**) on identifying key design aspects of different approaches to contestability and the potential implications of the application of competitive models for the planning and delivery of large-scale transmission projects.

This report provides a compilation of the detailed case studies analysed for the purposes of developing the main report. According to region, these case studies comprise:

- Australia – Victoria and NSW
- United Kingdom – offshore and onshore schemes
- United States (**US**) – PJM, California Independent System Operator (**CAISO**), Midcontinent Independent System Operator (**MISO**), and the New York ISO (**NYISO**).

Each case study covers (if applicable):

- Key learnings
- Scope of competitive tendering
- Threshold for triggering contestability
- Procuring party
- Tender assessment criteria/process
- Risk management
- Funding
- Cost recovery
- Model development/evolution
- Cost-benefit analysis conducted
- Outcomes.

Australia

1. Victoria

Design feature	Description
Scope of competitive tendering	If new transmission investment is required, AEMO undertakes a procurement process in accordance with requirements in the National Energy Rules (**NER**). Part H of Chapter 8 of the NER[1] sets out the process that is followed for new investments to extend the Distributed Service Network or increase its capacity. These are termed 'augmentations'. The RIT-T selects the preferred solution, and the AEMO's tender selects a bidder to design, construct, own and operate it. This is therefore a form of early competition.
Threshold for trigger contestability	Contestable augmentation is triggered under the following conditions:[2] 1. The capital cost of the augmentation exceeds value of $10 million 2. The work is separable – it provides a distinct and definable service and will not have a materially adverse effect on the incumbent Declared Transmission System Operator's (**DTSO's**) ability to provide services to AEMO under any relevant network agreement.
Procuring party	AEMO is responsible for the role of identifying both short term (through annual planning reports) and long-term needs (through the National Transmission Network Development Plan/Integrated System Plan) in Victoria. AEMO will conduct a RIT-T to select the solutions to their identified needs, after which they will run a competitive tender.[3]
Tender assessment criteria / process	AEMO follows a two-phased approach to its tender process:[4] **Phase 1 – Call for Expressions of Interest (CEI)** AEMO issues a CEI from those who may be interested in constructing, owning, and operating the proposed contestable transmission augmentations. The purpose is to determine whether potential bidders have the capacity capability and experience to build and operate the asset(s). **Phase 2 – Invitation to Tender (ITT)** Those who pass phase 1 are invited to submit a bid to the ITT. Bidders can bid for all contestable elements or individual contestable elements. At the end of this phase – AEMO will select a preferred bidder/s to construct, own and operate the proposed contestable transmission augmentations.

1 National Electricity Rules, Chapter 8.
2 National Electricity Rules, Chapter 8.
3 National Electricity Rules, Chapter 8.
4 AEMO, AusNet Services Group awarded contract to deliver Western Victoria Transmission Network Project (December 2019).

Design feature	Description
Risk management	In order to manage interface risk, Victoria is a good example of a contestable model that clearly outlines the incumbent's role in the tender process. The tender specification that AEMO develops must be developed in consultation with the incumbent.[5] Additionally in clause 8.11.1 of the NER, output specification risk (being 'the risk that inadequacies in the output specification will cause or contribute to design inadequacies', where the inadequacies are 'attributable to incorrect information provided by the incumbent') is allocated to the incumbent.
Cost recovery	AEMO's Transmission Use of System (**TUoS**) charges recover the costs for providing shared transmission network services in Victoria. TUOS prices are classified as Locational charges, Non-locational charges, and Common service charges.[6]
Cost-benefit analysis conducted	Farrierswier conducted a Transmission Contestability Principles report for Energy Networks Australia (**ENA**),[7] outlining a number of various potential costs and benefits of transmission contestability. Specifically, on receiving a submission from the incumbent TNSP Ausnet, they note that under the current Victorian contestability arrangements, transmission investments can take 'materially longer' than under the regulated monopoly model that is in place for the rest of the NEM. Other difficulties include those around contractual complexity, and coordination between planning and operation of the network.
Outcomes	In December 2019, AEMO announced that it selected Mondo (the commercial division of Ausnet Service Group) to plan, design, construct, own, operate and maintain the contestable transmission augmentations for the Western Victorian RIT-T.[8] This would be staged over several years, with the final component expected to be in operation by 2025.

1.1 Scope of competitive tendering

In Victoria, AEMO works to identify short term and long-term needs, after which the Regulatory Investment Test for Transmission (**RIT-T**) is used to carry out this assessment of potential investment options, consistent with the national framework. However, in Victoria, uniquely, augmentations undertaken for the purposes of customer reliability are assessed on a case-by-case basis using an estimated Value of Customer Reliability (**VCR**) in the RIT-T benefit cost analysis – there is no deterministic planning standard as in other jurisdictions.

If a decision is reached that new investment is required, AEMO undertakes a procurement process in accordance with requirements in the National Energy Rules (**NER**).[9] Part H of Chapter 8 of the NER sets out the process that is followed for new investments to extend the Distributed Service Network or increase its capacity. These are termed as 'augmentations'. The RIT-T selects the preferred solution, and AEMO's tender selects a bidder to design, construct, own and operate it. This is therefore a form of early competition.

5 National Electricity Rules, cl 8.11.7.
6 AEMO, Shared Transmission Network Services Prices in Victoria (May 2021).
7 Farrierswier, Transmission contestability principles (August 2021).
8 AEMO, Ausnet Services Group awarded contract to deliver Western Victoria Transmission Network Project (December 2019).
9 National Electricity Rules, Chapter 8.

1.2 Threshold for triggering contestability

Contestable augmentation is triggered under the following conditions:[10]

- The capital cost of the augmentation exceeds value of $10 million; and
- The work is separable – it provides a distinct and definable service and will not have a materially adverse effect on the incumbent Declared Transmission System Operator's (**DTSO's**) ability to provide services to AEMO under any relevant network agreement.

Augmentation may be excluded from contestability if AEMO has identified, in line with the NER, an otherwise contestable augmentation to be a non-contestable augmentation because the delay in implementation that would result from treating it as contestable would unduly prejudice power system security, or AEMO does not consider it economical or practicable to treat the augmentation as contestable.[11]

1.3 Procuring party

AEMO is responsible for the role of identifying both short term (through annual planning reports) and long-term needs (through the National Transmission Network Development Plan/Integrated System Plan) in Victoria. AEMO will conduct a RIT-T to select the solutions to their identified needs, after which they will run a competitive tender.

For the purpose of procuring the construction and operation, AEMO must publish an applicable tender and evaluation process that may include:[12]

- Timetables for the tender and evaluation process
- Details of the evaluation criteria
- Indications of the way in which different matters are to be weighted for evaluation purposes
- Provision for declaration and management of conflicts of interest.

1.4 Tender assessment criteria / process

For the Western Victoria Transmission Network Project, AEMO used a two-phase process to select preferred bidder(s):[13]

1. **Phase 1 – Call for Expressions of Interest (CEI)**
    a. AEMO issues a CEI from those who may be interested in constructing, owning, and operating the proposed contestable transmission augmentations. The purpose is to determine whether potential bidders have the capacity capability and experience to build and operate the asset(s).
    b. Contents of a response to CEI will include:[14]
        - The bidder's organisational information
        - Demonstrated recent experience in delivering projects of similar size, type, value, and complexity
        - Strategy, high-level resourcing, and timeframes for securing appropriate statutory and regulatory approvals
        - Details of any other organisations that the bidder intends to partner or contract with

10 National Electricity Rules, Chapter 8.
11 Clause 8.11.6 of the NER sets out the scenarios where AEMO may opt to classify a contestable augmentation as instead being non-contestable.
12 National Electricity Rules, Chapter 8.
13 AEMO, AusNet Services Group awarded contract to deliver Western Victoria Transmission Network Project (December 2019).
14 AEMO, Call for Expressions of Interest - Western Victoria Transmission Network Project - Contestable Transmission Works (January 2019).

- A brief high-level resource plan for project delivery of both design and construction
- Key risks and concerns, as well as any initial control measures
- Any alternative options to improve delivery timetable and/or cost

2. **Phase 2 – Invitation to Tender (ITT)**

   Those who pass phase 1 are invited to submit a bid to the ITT. Bidders can bid for all contestable elements or individual contestable elements. At the end of this phase – AEMO will select a preferred bidder/s to construct, own and operate the proposed contestable transmission augmentations.

Table 1: Indicative timetable

Stage	Duration
Issue of CEI	1 month
Issue of ITT	3 months
Assessment and enter applicable contracts	3 months
Construction commencement completion and commissioning	~5 years, varying depending on the project

Non-contestable components of the preferred option are offered to the incumbent TNSPs.

1.5 Risk management

In order to manage interface risk, Victoria is a good example of a contestable model that clearly outlines the incumbent's role in the tender process. The tender specification that AEMO develops must be developed in consultation with the incumbent.[15] The incumbent must:

- Provide information and assistance reasonably required by AEMO for the preparation of tender documents, including information about the technical interface; and
- Negotiate in good faith with a potential contestable provider about changes to the proposed augmentation connection agreement that are sought or suggested by that potential contestable provider.

In clause 8.11.1 of the NER, the allocation of risks for contestable augmentation are clearly set out, with site/Construction; statutory approval; native title; design, construction, and commissioning; and operating risks all allocated to the contestable provider. Outside of this, output specification risk which is 'the risk that inadequacies in the output specification will cause or contribute to design inadequacies' - where the inadequacies are 'attributable to incorrect information provided by the incumbent', then the risk is allocated to the incumbent.

1.6 Cost recovery

AEMO's Transmission Use of System (**TUoS**) charges recover the costs for providing shared transmission network services in Victoria.[16] TUOS prices are classified into Locational charges, Non-locational charges, and Common service charges:

- Locational charges – reflect the cost of using the network at various locations. Designed to encourage the most efficient use of the transmission network and are based on average maximum demand.

[15] National Electricity Rules, cl 8.11.7.
[16] AEMO, Shared Transmission Network Services Prices in Victoria (May 2021)

- Non-locational charges – recover the balance of AEMO's annual revenue for providing the shared transmission network.
- Prescribed common services – include the cost of planning and operating the network.

1.7 Cost-benefit analysis conducted

Farrierswier conducted a Transmission Contestability Principles report for Energy Networks Australia (**ENA**),[17] outlining a number of various potential costs and benefits of transmission contestability. This report relied on, among other things, a submission made by AusNet (the incumbent TNSP in Victoria) to an AEMC rule change. AusNet (the incumbent TNSP in Victoria) that under the current Victorian contestability arrangements, transmission investments can take 'materially longer' than under the regulated monopoly model that is in place for the rest of the NEM. Moreover, Ausnet noted that under these arrangements and division of functions between AEMO as independent planner and TSOs as asset owners there are a range of difficulties for the performance of the Victorian transmission system including:

- Coordination between the planning and operation of the network – a not-for-profit planner separate to the asset owner may be 'insensitive' to the financial rewards and penalties imposed upon the asset owner to maximise service to customers.
- Contractual complexity – the relationship between planning and operation of the network must be handled through a 'network services agreement' between the two parties, rather than through intra-firm processes. The split between the planner's responsibility for new connections and the DTSOs' ownership of network assets means connection applicants face greater complexity and are required to negotiate and conclude a larger number of agreements than in other states.

Other general costs or risks of contestability included:

- The revenue that can be earned by TNSPs for prescribed services is regulated by the AER. The prices for prescribed transmission services may be lower than prices under contestability . There is also a risk that competitive providers may expect a shorter period for the recovery of their capital compared with the current long depreciation periods applied when determining prices for regulated investments.
- Contestability is unlikely to result in any changes in service quality or increase in choice for customers. It may even result in poorer outcomes for customers if contestable providers focus on reducing short term costs rather than longer term asset performance and resilience.

1.8 Outcomes

In 2017, AEMO commenced a RIT-T to assess the technical feasibility and economic benefits of addressing limitations in the Western Victoria Transmission Network, in response to an identified need to increase the thermal capability of the Western Victorian Power System (aimed at reducing congestion to allow for new generation connection capacity).[18] There were five potential broad options, of which specific solutions were assessed in each option:

1. Minor network augmentations
2. New 220 kV transmission capacity
3. New 275 or 330 kV transmission capacity
4. New 500 kV transmission capacity
5. Non-network options

The RIT-T analysis concluded that the preferred solution delivering the maximum net market benefits was the construction of new double circuit 500 kV transmission line from Sydenham to North Ballarat,

[17] Farrierswier, Transmission contestability principles (August 2021).
[18] AEMO, Western Victoria Renewable Integration Project Assessment Draft Report (December 2018).

and a new 220 kV double circuit transmission line from North Ballarat to Bulgana (via Waubra), along with minor transmission line upgrades.[19] The expected net market benefits were estimated at $370 million.

In January 2019, AEMO issued a CEI from parties interested in designing, constructing, operating and owning the contestable components of the preferred option, in which it received 'several' expressions of interest. AEMO then issued a competitive closed invitation to tender, allowing selected CEI respondents to commence consideration of the contestable components of the preferred solution.

In December 2019, AEMO announced that it selected Mondo (the commercial division of Ausnet Service Group) to plan, design, construct, own, operate and maintain the contestable transmission augmentations for the Western Victorian RIT-T.[20] This would be staged over several years, with the final component expected to be in operation by 2025. The market benefits expected to be delivered are achieved through:

- the capital and dispatch cost of generation being 'significantly lower than they otherwise would have been'
- facilitation of future transmission network expansion
- improvements to the Victoria to NSW interconnector transfer limit

Ausnet will also construct, own, operate and maintain the majority of the non-contestable assets required for the project. After this announcement, a complete handover to Mondo took place, with them assuming all responsibility for delivering on the project, including liaising with stakeholders and providing updates on the project.

[19] AEMO, Western Victoria Renewable Integration Project Assessment Conclusions Report (July 2019).
[20] AEMO, Ausnet Services Group awarded contract to deliver Western Victoria Transmission Network Project (December 2019).

2. NSW

Design feature	Description
Scope of competitive tendering	Under the *Electricity Infrastructure Investment Act 2020* (**EII Act**), the delivery of Renewable Energy Zone network infrastructure projects can be tendered through a contestable process. Through these processes, the 'Network Operator' will be selected to develop, build, own (or lease), and finance new network infrastructure. This is a form of late-stage competition.[21]
Threshold for trigger contestability	It is expected that an entity known as the 'Infrastructure Planner' will run a contestable process to procure a Network Operator only where beneficial and practical. In some cases where the project is 'separable' from the existing network, a tender will be run, but in certain circumstances 'contestable provision may be unfeasible, and an incumbent Network Operator may be recommended'.[22] There is no minimum threshold that triggers contestability, but it is expected that contestability will typically only be expected to be applied to greenfield projects, with augmentations to the existing network carried out by the relevant incumbent.[23]
Procuring party	The Energy Corporation of NSW (**EnergyCo**) is the appointed Infrastructure Planner. It is a NSW Government-controlled statutory authority leading the delivery of NSW REZs – through coordinating REZ transmission, generation, firming and storage projects to deliver efficient, timely and coordinated investment.[24] Under the EII framework, the Infrastructure Planner is responsible for undertaking competitive procurement processes to select Network Operators.[25] It will set the procurement strategy, conduct the procurement process, evaluate submissions, and select a successful proponent, and consult the AER on its intended approach throughout the process.
Tender assessment criteria / process	While contestability in NSW is quite new and there is no prescribed process or criteria for selecting a Network Operator, the procurement process (which may vary across projects) broadly includes:[26] • Market sounding • Pre-qualification and participant registration • Expression of Interest, Request for Proposal, evaluation, and selection of the preferred proponent. No formal evaluation criteria have been published. The Infrastructure Planner may during the process, develop a shortlist of providers to encourage the shortlisted providers to develop more competitive

21 NSW Government, Network Infrastructure Projects (Part 5 of the Electricity Infrastructure Investment Act 2020) (October 2021).

22 NSW Government, Network Infrastructure Projects (Part 5 of the Electricity Infrastructure Investment Act 2020) (October 2021).

23 NSW Government, Network Infrastructure Projects (Part 5 of the Electricity Infrastructure Investment Act 2020) (October 2021).

24 NSW Government, Renewable Energy Zones.

25 AER, Revenue determination guideline for NSW contestable network projects- Draft (May 2022).

26 NSW Government, Network Infrastructure Projects (Part 5 of the Electricity Infrastructure Investment Act 2020) (October 2021).

Design feature	Description
	proposals, as well as to reduce administrative costs of running the tender by reducing the need to assess uncompetitive tender proposals.[27]
Funding	REZ transmission receives a mixture of public and private funding. Bidders will propose their funding mix of debt and equity in their proposals to finance the project. Projects such as the Central-West Orana Rez 330kv and 500kv transmission lines, substation(s) and related infrastructure are also receiving Australian Renewable Energy Agency (**ARENA**) funding (public funding).[28]
Cost recovery	The regulator (AER) makes revenue determinations for Network Operators that have been selected to carry out network infrastructure projects under the EII Act.[29] The Transmission Efficiency Test (**TET**) is a key input into the Regulator's revenue determination on the "amount payable to a Network Operator". The TET is a key input into the regulator's revenue determination on the 'amount payable to a Network Operator'. The detailed design and implementation of the TET and revenue determination will be set through regulations in guidelines, or where permitted by the EII Act, be the decision of the regulator. The extent to which the regulator is required to calculate the components of the revenue determination is dependent on the extent to which these costs have already been assessed in the contestable process. If a project is selected through the contestability process, some costs are expected to be identified through the tender process, and this may translate to a more limited role for the regulator in reflecting these costs along with determining other cost components in the revenue determination.[30]
Model development / evolution	To facilitate a heightened ambition for investment in renewable generation as laid out in its Electricity Infrastructure roadmap, the NSW Government passed the EII Act to declare five REZs in NSW. With respect to transmission infrastructure, the EII Act created a role for an Infrastructure Planner with power to establish a planning function and provide the option of implementing contestability in both ownership and operation of priority transmission Infrastructure projects within the REZ.
Cost-benefit analysis conducted	Contestability in NSW was only introduced in 2020 and has not yet fully completed a tender. As such, there is limited information around cost-benefit analyses under this framework.
Outcomes	As the EII Act came into place only recently in 2020, there is only one REZ currently with public information around the competitive transmission procurement process, which is the Central-West Orana renewable energy zone. In May 2022, the NSW Government announced a tender shortlist for the Central-West Orana REZ, which is Australia's first REZ.[31]

[27] NSW Government, Network Infrastructure Projects (Part 5 of the Electricity Infrastructure Investment Act 2020) (October 2021).
[28] Transgrid, Central-West Orana REZ Transmission Fact Sheet.
[29] NSW Government, Network Infrastructure Projects (Part 5 of the Electricity Infrastructure Investment Act 2020) (October 2021).
[30] AER, Revenue determination guideline for NSW contestable network projects- Draft (May 2022).
[31] NSW Government, Central-West Orana renewable energy zone tender shortlist announced (May 2022).

2.1 Scope of competitive tendering

Under the *Electricity Infrastructure Investment Act 2020* (**EII Act**), the delivery of REZ network infrastructure projects can be tendered through a contestable process. Through these processes, the 'Network Operator' will be selected to 'develop, build, own (or lease), and finance new network infrastructure.[32] Under these arrangements, the incumbent transmission operator will not automatically have exclusive right to develop, build, own (or lease) and finance assets that provide 'shared REZ network infrastructure services necessary for a REZ'. The project deed (the contractual arrangement between the Infrastructure Planner and the successful Network Operator) sets out the target commercial operation date, route selection, substantial locations, and REZ Network Specification (including initial provision of system strength), of which the Network Operator will develop, build etc. the network infrastructure.[33]

The delivery of REZ network infrastructure projects can undergo a competitive process involving multiple companies to help drive the most efficient outcome for consumers. Outside of the introduction of contestability, responsibility for transmission system operation remains with the incumbent (Transgrid) as the primary transmission network system provider in NSW.

In an EII Act Policy Paper, the NSW Department of Planning, Industry and Environment acknowledge that there are a range of potential models for contestability, with key differences in the timing (early vs late) and risk management under the contractual agreements.[34] They discuss that selecting a model for competitive procurement must balance 'various other objectives' including reducing barriers faced by non-incumbent network service providers without 'ignoring the real advantages of incumbent network service providers'; and encouraging innovative solutions that provide lower costs/higher value without 'unfairly shifting risk to customers or regulated incumbents'. However to date, NSW has utilised a late model for its competitive solicitations.

2.2 Threshold for triggering contestability

The NSW Department of Planning, Industry and Environment expects that 'the Infrastructure Planner will run a contestable process to procure a Network Operator' only 'where beneficial and practical'.[35] In some cases, a tender will be run, but in certain circumstances 'contestable provision may be unfeasible, and an incumbent Network Operator may be recommended'.

It is therefore at the discretion of the Infrastructure Planner whether they believe it is appropriate to contestably procure transmission projects. The Infrastructure Planner may use both contestable and non-contestable processes to select a Network Operator or Network Operators, depending on the circumstances of a particular project and REZ. For example, if a project is not 'readily separable' from the existing shared transmission network, the Infrastructure planner may recommend the project as two separate REZ network infrastructure projects – one being a contestably procured Network Operator, and the other to be delivered by the incumbent. Contestability is expected to only be used for separable, greenfield projects.

For augmentation required to existing networks inside and out of the REZ, it is not proposed that these be subject to contestability – where an existing network requires augmentation, it will be done by the owner of that network.

32 NSW Government, Network Infrastructure Projects (Part 5 of the Electricity Infrastructure Investment Act 2020) (October 2021).
33 NSW Government, REZ access rights and scheme design: Central-West Orana (December 2021).
34 NSW Government, Network Infrastructure Projects (Part 5 of the Electricity Infrastructure Investment Act 2020) (October 2021).
35 NSW Government, Network Infrastructure Projects (Part 5 of the Electricity Infrastructure Investment Act 2020) (October 2021).

2.3 Procuring party

Infrastructure Planner

The Energy Corporation of NSW (**EnergyCo**) is a NSW Government-controlled statutory authority leading the delivery of NSW REZs – through coordinating REZ transmission, generation, firming and storage projects to deliver efficient, timely and coordinated investment.[36] EnergyCo is the appointed Infrastructure Planner for NSW.

Under the EII framework, the Infrastructure Planner is responsible for undertaking competitive procurement processes to select Network Operators.[37] It will set the procurement strategy, conduct the procurement process, evaluate submissions, and select a successful proponent, and consult the AER on its intended approach throughout the process.

Consumer Trustee

AEMO Services Limited is appointed as the NSW Consumer Trustee, with various planning, advisory and procurement functions under the EII Act.[38] AEMO Services must act '"independently and in the long-term financial interest of NSW electricity consumers."

A Network Operator may be selected to carry out a network infrastructure project under one of two ways:

1. Under a contestable process, whereby the Network Operator is selected through a competitive procurement process conducted by the Infrastructure Planner.
2. Under a non-contestable process, a Network Operator is selected directly by the Infrastructure Planner.

In both methods, the Network Operator must be authorised by the Consumer Trustee before carrying out the network infrastructure project. The Consumer Trustee on receipt of a recommendation from the Infrastructure planner may authorise a Network Operator to carry out the recommended REZ network infrastructure project, but they are not able to develop or propose an alternative project itself.

Role of the regulator

In November 2021, the AER was appointed as the regulator under the EII Act. The key functions of the role in addition to its collaboration with the Infrastructure Planner are:

- to apply a Transmission Efficiency Test;
- make revenue determinations for Network Operators authorised by the Consumer Trustee or by the Minister to undertake network infrastructure projects.

These roles are further discussed in section 2.7.

The AER also undertakes reviews of the Infrastructure Planner's procurement process at two points:[39]

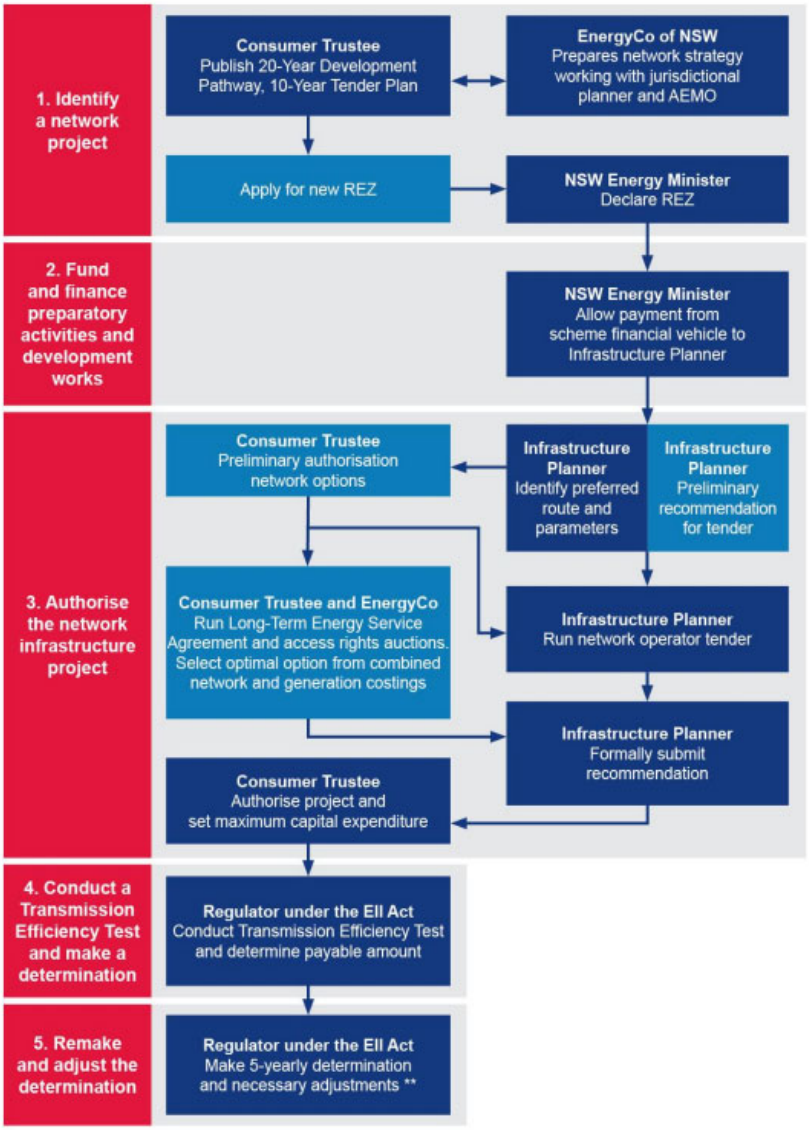
1. At the start of the procurement process – the AER reviews the procurement strategy developed by the Infrastructure Planner on the likelihood that it will result in submissions that represent the 'prudent, efficient and reasonable costs for carrying out the network infrastructure project and provide the information the AER requires to make a revenue determination'. The AER has an evaluation criterion to guide review of the procurement strategy.

[36] NSW Government, Renewable Energy Zones.
[37] AER, Revenue determination guideline for NSW contestable network projects- Draft (May 2022).
[38] AER, Revenue determination guideline for NSW contestable network projects- Draft (May 2022).
[39] AER, Revenue determination guideline for NSW contestable network projects- Draft (May 2022).

2. After the procurement process has been completed and a Network Operator selected, the AER decides whether the process 'is likely to have produced an outcome that reflects prudent, efficient and reasonable costs and is otherwise consistent with the EII Act'.

2.4 Tender assessment criteria / process

Figure 1: Overview of the planning and tender process



Source: NSW Government, Network Infrastructure Projects (Part 5 of the Electricity Infrastructure Investment Act 2020) (October 2021)

Under step 3 of the above process, after the identification of a network project has taken place and a REZ has been declared, where 'beneficial and practical', the Infrastructure Planner will run a contestable process to procure a Network Operator. As part of a preliminary recommendation, the Infrastructure Planner will highlight which stages and parts of a REZ network infrastructure project are recommended to be subject to contestable delivery, and those other parts that will be provided by the incumbent. This preliminary recommendation is submitted to the Consumer Trustee, and once authorised, the Infrastructure planner will run a Network Operator Tender.

The Network Operator Tender is based on the Network Operator's ability to deliver on the technical requirements to be recommended in the Infrastructure Planner's recommendation to the Consumer

Trustee, with most design decisions already 'locked in'. These design decisions that are locked in by the Infrastructure Planner's recommendation include 'route selection, most substation locations, the project's operational date, functional specifications and minimum technical or safety requirements'. Despite this, specific aspects that Network Operator proponents have discretion over in their proposal include the schedule of construction works, construction methodologies and some material or equipment used. Proposals may also identify improvements 'through innovation in design or delivery' of the network solution while meeting technical specifications.[40]

Procurement strategy/process

The AER is responsible for reviewing the procurement strategy proposed by the Infrastructure Planner. In their role, they intend to utilise the following evaluation criteria/conditions (which is still under consultation) to determine if they are satisfied with the procurement strategy:[41]

- A sufficient level of competitive tension exists, such that a competitive outcome will likely be achieved
- Pre-qualification and participant registration processes are undertaken
- The project scope is identified and is sufficiently clear
- Procurement rules, processes and procedures (including submission evaluation criteria) providing transparency to potential proponents and reflect good industry practice.
- Analysis has been undertaken on the likely prudent, efficient and reasonable costs to carry out the Project to inform the evaluation process
- Minimum requirements with which submissions must comply.

The procurement process, which may vary across projects, broadly includes:

1. Market sounding
2. Pre-qualification and participant registration
3. Expression of Interest
4. Request for Proposal
5. Evaluation
6. Selection of the preferred proponent

The Infrastructure Planner may, during the process, develop a shortlist of providers to encourage the shortlisted providers to develop more competitive proposals, as well as to reduce administrative costs of running the tender by reducing the need to assess "uncompetitive tender proposals."[42]

The successful proposal is expected to be binding 'in large part' with limited scope for variations on the Network Operator. It informs the Infrastructure Planner's recommendation to the Consumer Trustee for authorisation, as well as to be used by the AER in making a determination for 'allowed cost recovery'.[43]

2.5 Funding

REZ transmission receives a mixture of public and private funding.

[40] NSW Government, Network Infrastructure Projects (Part 5 of the Electricity Infrastructure Investment Act 2020) (October 2021).
[41] AER, Revenue determination guideline for NSW contestable network projects - Draft (May 2022).
[42] NSW Government, Network Infrastructure Projects (Part 5 of the Electricity Infrastructure Investment Act 2020) (October 2021).
[43] NSW Government, Network Infrastructure Projects (Part 5 of the Electricity Infrastructure Investment Act 2020) (October 2021).

Bidders will propose their funding mix of debt and equity in their proposals to finance the project. Projects such as the Central-West Orana Rez 330kv and 500kv transmission lines, substation(s) and related infrastructure are also receiving Australian Renewable Energy Agency (**ARENA**) funding (public funding).[44]

2.6 Cost recovery

The regulator (AER) makes revenue determinations for Network Operators that have been selected to carry out network infrastructure projects under the EII Act.[45]

The Transmission Efficiency Test (**TET**) is a key input into the Regulator's revenue determination on the "amount payable to a Network Operator". The TET is a key input into the regulator's revenue determination on the 'amount payable to a Network Operator'. The EII Act requires that the revenue determination include the following minimum components:

1. Repayment of capital costs as determined under the TET
2. The return on capital costs that have not been repaid
3. An allowance for operating costs.

However, under the NER, the AER is required to accept a proposed forecast of capital expenditure if it reasonably reflects:[46]

1. The efficient costs of achieving the capital expenditure objectives in the NER (essentially, the delivery of network services, including to meet demand, comply with all regulatory obligations and requirements relating to the provision of network services and to maintain the quality, reliability, security and safety of those services and the transmission or distribution system)
2. The costs that a prudent Network Operator would require to achieve the objectives
3. A realistic expectation of the demand forecast, and cost inputs required to achieve the objectives.

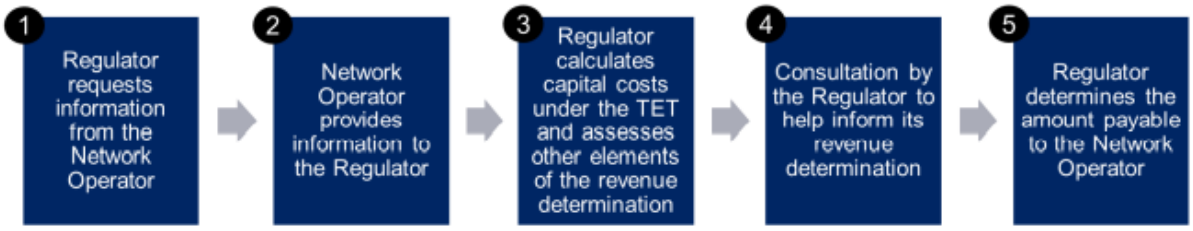
Tenderers can bid on capital costs (including IRR) and operating costs, but the overall revenue requirement could be determined by the regulator as part of the revenue determination. Potential Network Operators would bid costs for which they are willing and able to deliver the project if selected. The AER will apply the TET to assess a Network Operator's proposed capital costs, to decide whether they are satisfied that the proposed capital costs for development and construction are 'prudent, efficient and reasonable'.[47]

The detailed design and implementation of the TET and revenue determination will be set through regulations in guidelines, or where permitted by the EII Act, be the decision of the Regulator. The extent to which the regulator is required to calculate the components of the revenue determination is dependent on the extent to which these costs have already been assessed in the contestable process. If a project is selected through the contestability process, some costs are expected to be identified through the tender process, and this may translate to a more limited role for the regulator in reflecting these costs along with determining other cost components in the revenue determination.[48]

In addition to this, the AER provides a high-level overview of a proposed process for making a revenue determination under the EII Act as detailed below. Under this proposed procurement process, the successful proponent will submit a revenue proposal to the AER:

44 Transgrid, Central-West Orana REZ Transmission Fact Sheet.
45 NSW Government, Network Infrastructure Projects (Part 5 of the Electricity Infrastructure Investment Act 2020) (October 2021).
46 NSW Government, Network Infrastructure Projects (Part 5 of the Electricity Infrastructure Investment Act 2020) (October 2021).
47 AER, Revenue determination guideline for NSW contestable network projects - Draft (May 2022).
48 AER, Revenue determination guideline for NSW contestable network projects - Draft (May 2022).

Figure 2: Overview of the proposed revenue determination process under the EII Act



Source: AER, Revenue determination guideline for NSW contestable network projects - Draft (May 2022).

2.7 Model development / evolution

In 2020, the NSW Government heightened its ambition for investment in renewable generation, laying out the NSW Electricity Infrastructure Roadmap (the NSW Roadmap) with aims to increase renewable capacity by 12GW and incentivise around $32bn in private sector generation and transmission investment by 2030.[49]

As a result, the NSW Government passed the EII Act to declare five REZs in NSW and provide a framework for the delivery of:

- 3 GW of network capacity for the Central West Orana REZ
- 8 GW of network capacity in the New England REZ
- 1 gigawatt of additional capacity.

With respect to transmission infrastructure, the EII Act created a role for an Infrastructure Planner with power to establish a planning function and provide the option of implementing contestability in both ownership and operation of priority transmission Infrastructure projects within the REZ.[50]

2.8 Cost-benefit analysis conducted

Contestability in NSW was only introduced in 2020 and has not yet fully completed a tender. As such, there is limited information available in relation to cost-benefit analyses conducted.

2.9 Outcomes

As the EII Act came into place only recently in 2020, there is only one REZ currently with public information around the competitive transmission procurement process, which is the Central-West Orana renewable energy zone.

Central-West Orana renewable energy zone

In May 2022, the NSW Government announced a tender shortlist for the Central-West Orana REZ, which is Australia's first REZ.

The short-listed tenderers for the REZ were:[51]

- ACE Energy - comprising Acciona, Cobra and Endeavour Energy
- Network REZolution - comprising Pacific Partnerships, UGL, CPB Contractors and APA Group
- NewGen Networks – comprising Plenary Group, Elecnor, Essential Energy and SecureEnergy

[49] NSW Government, What is the Electricity Infrastructure Roadmap?.
[50] NSW Government, Network Infrastructure Projects (Part 5 of the Electricity Infrastructure Investment Act 2020) (October 2021).
[51] NSW Government, Central-West Orana renewable energy zone tender shortlist announced (May 2022).

EnergyCo will invite the shortlisted tenderers to respond to an RFP, with the contract to be awarded in 2023.

United Kingdom

Since 2009, Ofgem, Great Britain's electricity and gas regulator, has used a form of 'very late competition' for procuring offshore wind transmission infrastructure. According to the UK Government, this competitive tender process has saved consumers over £800 million.[52] To date, late models of tendering have received greater focus from the industry and Ofgem due to its lower complexity and reduced bidder risk. However, due to the success of the offshore competitive tender process and the need to minimise costs for consumers and promote innovation in transmission solutions required to achieve the UK's net zero target, the UK Government has committed to enable competitive tenders in onshore networks.[53]

3. Offshore competition

Design feature	Description
Scope of competitive tendering	The current and only competitive tendering model in use in UK offshore transmission is the generator build, 'very late' stage model.[54] Under this model, the developer conducts detailed network design, pre-construction planning and construction of the asset, after which Ofgem conducts a competitive tender to select a competitively appointed Offshore Transmission Owner (**OFTO**). The OFTO assumes ownership and ongoing operation of the asset for the operational period. The current generator build (very late stage) means that the OFTO takes responsibility for a fully operational asset and does not face risks of construction. At the same time, this means that new solutions to design and development are not subject to competition. Although there is also an OFTO build model available (whereby the generator obtains the connection offer and undertakes high level design and preliminary works, and the OFTO constructions, operates and maintains the asset), this has never been used.[55] Possible reasons for this include generators' perceived risks of asset delay, uncertainty around likely TNUoS charges as compared to the generator build, and the perceived risk surrounding OFTO capability.
Threshold for trigger contestability	There is no minimum value of project or specified threshold for triggering contestability in offshore transmission. All offshore projects as procured and tendered by Ofgem are subject to very late contestability.

[52] Department for Business, Energy and Industrial Strategy, Energy White Paper: Powering our Net Zero Future (December 2020).
[53] Department for Business, Energy and Industrial Strategy, Competition in Onshore Electricity Networks (2021), p. 10.
[54] Ofgem, Offshore Electricity Transmission (OFTO), (n,d,).
[55] Ofgem, Offshore Electricity Transmission (OFTO), (n,d,).

Design feature	Description
Procuring party	Ofgem is the procuring party and runs very late competition tenders to select OFTOs. As the procuring party, Ofgem is responsible for consent and construction, financing and value transfers (cost assessments), tender processes, licences and contracts, and reviewing claims for revenue adjustment.[56]
Tender assessment criteria / process	The tender process is broken down into three key stages: Enhanced Pre-Qualification (**EPQ**), Invitation to Tender (**ITT**), and Preferred Bidder (PB)/ Successful Bidder (**SB**). Bidders are evaluated in four key areas: cost, financial deliverability, legal/commercial factors, and technical factors. The first two factors are assessed at the ITT stage, while the latter two factors are assessed at the EPQ stage. Some areas are evaluated using scores, while others are evaluated based on a threshold pass/fail basis. Bids must meet a minimum threshold for financial deliverability (or price robustness) (previously this was scored), and then are scored solely on price.[57]
Risk management	Delivery, construction, delay, and cost overrun risks are mitigated by the design of the very late competition model. Unlike early competition, developers are responsible for design and construction of the transmission assets, meaning that the OFTOs avoid assuming the risk of delivery, construction, and delay. Cost overrun risk is mitigated by the fixed nature TRS payments, and the risks of non-availability and the generation asset becoming stranded are mitigated by availability incentives and the OFTO of Last Resort mechanism.[58]
Funding	Funding of generator build transmission assets is relatively low risk for investors and debt financiers. This is because the OFTO does not face any risk of development or construction. As such, funding usually takes the form of non-recourse or Special Purpose Vehicles (**SPV**), using an array of debt sources including bank debt, private placement bonds and public bonds.[59]
Cost recovery	OFTOs recover costs through a 25-year TRS paid by the National Electricity Transmission System Operator (**NETSO**). This TRS, which is recovered from consumers, is based on the bid by the successful bidder in the competitive process. Due to the fixed nature of the TRS payment, the OFTO has an incentive to minimise maintenance and operating costs, without jeopardising availability payments. Bidders are responsible for their own costs of developing and submitting their submissions during tender, with costs to be paid at specified stages of the process.[60]

56 Ofgem, Offshore Electricity Transmission (OFTO), (n,d,).
57 Ofgem, Generic and project specific Preliminary Information Memorandums for offshore electricity transmission transitional projects (July 2009), np.
58 Ofgem, Offshore Transmission: Guidance for Cost Assessment (20 December 2012).
59 KPMG UK for the Gas and Electricity Markets Authority, Offshore Transmission: An Investor Perspective – Update Report (January 2014).
60 Ofgem, Offshore Transmission: Guidance for Cost Assessment (20 December 2012).

Design feature	Description
Model development / evolution	The model has iteratively been modified and developed over time. The most significant change was the introduction of the enduring regime which introduced the OFTO build option (which has not yet been used). To mitigate the barriers associated with the OFTO build option, Ofgem has updated the OFTO build framework in relation to the late OFTO build option to give generators the flexibility to work with Ofgem to develop a tailored tender option. Other changes include altering the bid evaluation criteria (from being scored metrics to thresholds) and the timing of debt finance competition.[61]
Cost-benefit analysis conducted	CEPA (Cambridge Economic Policy Associates) and Ofgem conducted an evaluation of Tender Rounds 2 and 3, with the aim of identifying how competitive tendering in late-stage offshore transmission has delivered cost savings (or increases), in comparison to five various counterfactual models. This involved a quantitative NPV assessment of the expected costs (financing, operating, procurement costs, etc.) under these counterfactual models, which were characterised either as 'Licensed merchant counterfactuals' or 'Regulated price control counterfactuals.' The highest cost saving of ~£1,100m was delivered against a generator build and operate scenario. Qualitative elements such as tender/project coordination, innovation, and information asymmetry were also included in the evaluation.[62]
Outcomes	Since 2009, competitive tender processes are estimated to have saved consumers more than £800 million. CEPA identified that cost savings across all counterfactual scenarios increased with each progressive tender. This is driven by improvements and identification of efficient operating/financing costs, but also by pressures solicited by competition. Further, OFTOs have been outperforming their availability targets, highlighting the importance of availability incentives in ensuring transmission assets are well-managed.[63]

3.1 Scope of competitive tendering

Since 2009, Ofgem has run a competitive tender process to select and licence Offshore Transmission Owners (**OFTO**), entities responsible for the ongoing ownership and operation of offshore transmission assets.[64] While the late competition model in UK's offshore transmission market was introduced to help drive costs lower, it was also implemented to provide bidders with an "unprecedented opportunity to enter the UK regulated electricity transmission sector." The model was designed to provide a "level playing field" and to "encourage the widest possible participation from potential investors, including new entrants to the GB electricity transmission market."[65] Generators currently face two options for developing offshore transmission assets under the enduring OFTO regime:

- **Generator builds**: The generator carries out the preliminary works, procurement and construction of the asset and the OFTO operates and maintains the asset
- **OFTO builds** (yet to be used): The generator obtains the connection offer and undertakes high level design and preliminary works, and the OFTO constructs, operates and maintains the asset.

There are two possible OFTO build options available:

61 Ofgem, Offshore Electricity Transmission (OFTO), (n,d,).
62 CEPA & Ofgem, Evaluation of OFTO Tender Round 2 and 3 Benefits (18 March 2016).
63 CEPA & Ofgem, Evaluation of OFTO Tender Round 2 and 3 Benefits (18 March 2016).
64 Ofgem, Offshore Electricity Transmission (OFTO), (n,d,).
65 Ofgem, Generic and project specific Preliminary Information Memorandums for offshore electricity transmission transitional projects (July 2009).

1. **Early OFTO build**: Following the generator obtaining a connection offer, the OFTO bids its approach to aspects of preliminary works, consenting, design, procurement, financing, construction, operation, maintenance and decommissioning of the transmission assets and the costs associated with these activities
2. **Late OFTO build**: Following the generator undertaking preliminary works, consenting and high-level design of the transmission assets, the OFTO bids its approach to procurement, financing, construction, operation, maintenance and decommissioning of the transmission assets and the costs associated with these activities.

The current generator build (late stage) means that the OFTO takes responsibility for a fully operational asset and does not face risks of construction. This attracts investors looking for a stable, low-risk investment in return for lower returns, which reduces the cost of finance for the long-term operation of the transmission asset, delivering significant saving to the consumers. In contrast, holding a competitive process early has the potential to incentivise greater innovation, but the successful bidder would be exposed to the risks of development and construction and would increase the returns investors expect, to reflect the greater risks faced during the earlier stages of the project.

3.2 Threshold for triggering contestability

There is no minimum value of project or specified threshold for triggering contestability in offshore transmission. All offshore projects as procured and tendered by Ofgem are subject to 'very late' contestability.

3.3 Procuring party

Ofgem is the procuring party who runs tenders to identify OFTOs. Ofgem's role in offshore transmission can be summarised below:[66]

Table 2: Ofgem's role in offshore transmission

Areas of responsibilities	Ofgem
Consent and construction	Make all project information (e.g., detailed operating plans) available to bidders so that they can make informed investment decisions.
Financing and value transfers	• Undertake a cost assessment ahead of the ITT stage to provide an indicative transfer value (ITV) based on their estimate of the economic and efficient costs incurred in developing and constructing the relevant transmission assets. • Once construction is complete, conduct final cost assessments of developing the TRS (Final Transfer Value - FTV).
Tender process	• Select the projects that qualify for the tender round. • Run competitive tender exercises in order to determine which entities will be granted OFTO licenses for each qualifying project.
Licenses and contracts	• Monitor compliance of licensees with the provisions of the OFTO Licence • Counterparty to licence with OFTO, developer and ESO
Operation	• Review claims for revenue adjustment e.g. Income Adjusting Event • Management of OFTO of last resort process.

[66] National Grid ESO, Early Competition Plan – Project Documents: Phase 2 Consultation Documents (July 2020).

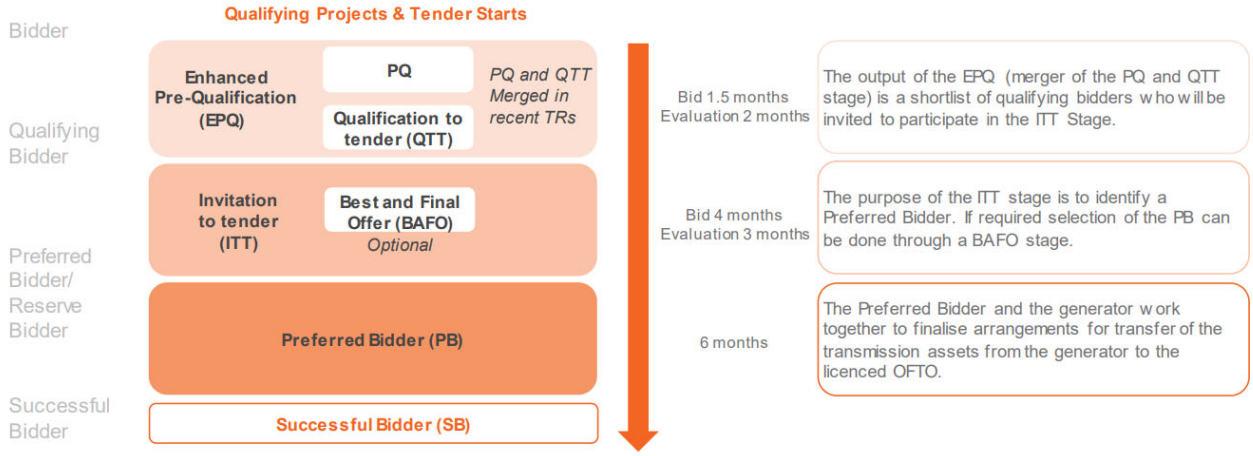
The "Financing and value transfers" responsibility follows three stages, including an Initial Transfer Value (InTV), Indicative Transfer Value (ITV) and a Final Transfer Value (FTV). The InTV comprises an indicative cost assessment template (CAT) which is broken down into the following cost categories:[67]

- Offshore substation(s)
- Submarine cable (incl. any interlink)
- Onshore cable
- Onshore substation
- Reactive substation
- Connection.

3.4 Tender assessment criteria / process

The figure below provides a high-level overview of the OFTO tender process, with indicative timelines.

Figure 3: OFTO tender process



Source: National Grid ESO, Early Competition Plan – Project Documents: Phase 2 Consultation Documents (2021).

The main stages of the tender process are detailed below:[68]

Stage	Description
Enhanced Pre-Qualification (EPQ)	Ofgem publishes an EPQ document. This establishes the range of requirements that bidders must demonstrate that they meet to participate in the next stage of the bidding process. After the evaluation of EPQ submissions, Ofgem will publish a shortlist of bidders that have qualified to the next stage, whilst also providing feedback to bidders.
Invitation to Tender (ITT)	Ofgem publishes an ITT document to the determined shortlist of bidders, outlining the evaluation criteria to be considered when selecting a preferred bidder (PB), as well as the indicative transfer value (ITV). Potential OFTOs then collate and submit their bids based on all information provided by Ofgem and by the Developer via a 'data room'.

67 Ofgem, Offshore Transmission: Guidance for Cost Assessment 2019 (April 2019), p. 9.
68 Ofgem, Offshore Transmission: Guidance for Cost Assessment 2019 (April 2019).

Stage	Description
Preferred Bidder (PB)	The PB and the Developer will agree the form of documents surrounding the transfer of Transmission Assets. Ofgem drafts a project specific offshore transmission licence, which includes the 25-year TRS bid by the PB, modified by the Final Transfer Value (FTV – the final cost assessment of the project).
Successful Bidder and Licence Grant	Ofgem releases a notice with its intention to grant the license to the successful bidder. After a 'standstill period' the final commercial documents are executed and the OFTO license is granted. The 'standstill' period is a short pause during which suppliers can challenge the decision. This is then followed by financial close and asset transfer.

Bids are evaluated in four key areas, with the specifics of the evaluation criteria published in advance:[69]

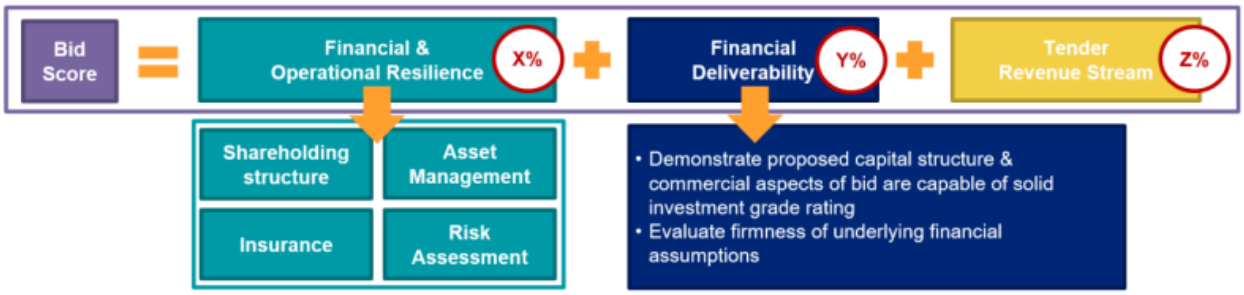
1. **Cost**
   - Deliver the lowest cost to customers
   - Cost is the primary component of evaluation and is measured through the bid WACC in the construction/acceptance period (which is bid by potential investors).
   - Evaluated in the ITT stage of the Tender Process.
2. **Financial Deliverability**
   - Bidders will be required to demonstrate that their financing plan is 'robust and deliverable'
   - Financial deliverability is mandatory and assessed on a pass/fail basis
   - Certain elements of deliverability are mandatory – such as a minimum level of equity investment up front, a minimum credit rating as per the licence from Ofwat and a cap on net debt/regulatory capital value (RCV).
   - Financial Deliverability is assessed throughout the ITT stage
3. **Legal/Commercial**
   - Bidders are given the opportunity to review and comment on key transaction, legal and commercial documents early in the process
   - This aspect is subject to evaluation at bid submission at the EPQ stage.
4. **Technical**
   - Experience, track record and relevant management expertise are assessed at EPQ stage.
   - Bidders are not assessed from a technical perspective beyond the EPQ stage.

Prior to TR6, Ofgem evaluated the bids on the basis that bidders' proposals were evaluated on a threshold basis and then the evaluation scores were a mix of price (60%) and price robustness (40%). In TR6, bids were evaluated on a threshold basis where price robustness is factored into this threshold, but with the bid score being 100% weighted on price.

Ofgem is considering an alternative approach to assessing qualitatively each component element to bids, in which a score is provided for each section of financial and operational resilience; financial deliverability; and tender revenue stream, which are then weighted and aggregated together to provide an overall bid score:

[69] National Grid ESO, Early Competition Plan – Project Documents: Phase 2 Consultation Documents (2021).

Figure 4: Potential bidder evaluation approach[70]



Source: Ofgem, Decision on developments to the tender process within the current OFTO Transmission Owner (OFTO) regime (April 2021).

3.5 Risk management

Risk of delivery, delay and costs are all managed inherently in the design of the very late competition model. Risk of delivery and delay are all borne by the generator, as competition is only introduced at the operation stage of the life cycle. Risk of delayed completion is therefore taken away from the OFTOs. Moreover, as the TRS payment is fixed, OFTOs are incentivised to minimise their ongoing maintenance and operating costs to maximise profits.

Further, OFTOs are incentivised to make the asset available through adjustments to the fixed payment for unavailability.[71] Although revenue is fixed for OFTOs, the OFTO license framework incorporates mechanisms that allow for future adjustments of revenue for certain exceptional events (Income Adjusting Event (IAE)).

Additionally, in 2014 Ofgem developed an OFTO of Last Resort mechanism to enable the appointment of an OFTO outside of the competitive process in circumstances where the failure of an existing OFTO business risks a generator being stranded.[72]

3.6 Funding

For late-stage generator build models, since the OFTO does not face construction risks, investors looking for stable, low-risk investment are attracted to financing the long-term operation of the transmission asset, which translates to savings for consumers.

Key findings from Tender Round 5 of OFTO assets outlined in the ESO's "Early Competition Plan"[73] showed that bidders typically used a 'project finance structure', with non-recourse or limited Special Purpose Vehicles (SPV) and high gearing. OFTOs have been financed using an array of debt sources including bank debt, private placement bonds, public bonds (and a combination of these).

3.7 Cost recovery

Under both models (generator builds and OFTO builds), OFTOs receive a 25-year tender revenue stream (**TRS**), paid by the National Electricity Transmission System Operator (**NETSO**). This is included in the OFTO licence, as well as any uplift to be applied over the contract term. Bonuses and deductions are made based on availability. The TRS is based on the TRS bid by the successful bidder in the competitive process.

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70 Ofgem, Decision on developments to the tender process within the current OFTO Transmission Owner (OFTO) regime (April 2021).

71 National Grid ESO, Early Competition Plan – Project Documents: Phase 2 Consultation Documents (2021).

72 Ofgem, Guidance on the Offshore Transmission Owner (OFTO) of Last Resort Mechanism (2014).

73 National Grid ESO, Early Competition Plan – Project Documents: Phase 2 Consultation Documents (2021).

The OFTO pays the developer the 'efficient-build cost' (determined by Ofgem) and receives an annual 'management fee' in return, for the term for which the license is granted (25 years). [74] Ofgem undertakes a cost assessment to determine the 'economic and efficient costs' or 'transfer value' for offshore electricity transmission projects developed and constructed by developers.

Bidders in the tender process are responsible for their own costs of developing and submitting their submissions during tender. The costs are paid to Ofgem and are associated with progressing to each stage of the tender process. Bidders are required to pay Ofgem when they submit their PQ submission, when they are confirmed as Preferred Bidder (PB), and as the Successful Bidder to pay Ofgem a fixed fee & potential variable component, on the grant of the OFTO license.[75]

3.8 Model development / evolution

The first significant change to the OFTO regime was the introduction of the OFTO build option under the enduring regime. According to Ofgem, this change would deliver the following benefits:[76]

- reduced capital expenditure required from generators for delivering projects
- ensuring time-critical pre-construction works are not delayed
- reduced transmission construction risk for generators, allowing them to focus on the generation aspects of their projects
- a streamlined tender approach to allow timely OFTO appointment by overlapping the consenting, procurement and tendering processes
- significant scope for innovation, including in asset design, procurement, construction, financing of projects and risk management
- enhanced scope to attract new sources of capital
- enhanced scope for new market entrants (for example, amongst bidders and the supply chain).

The first tender under the enduring regime was in 2014 (TR3), however to date, the OFTO build option has yet to be used. Ofgem has identified the following barriers to developers choosing the OFTO build option:[77]

- **Delivery risk:** in particular, offshore generators' perceived risks of transmission asset delay, construction interface management, supply chain roles and procurement process and transmission asset quality that could impact on their generation revenues.
- **Cost:** uncertainty around likely TNUoS charges as compared to generator build
- **Capability:** perceived risk around OFTO capability, particularly in managing interfaces with generation construction and commissioning, and delivering transmission assets on time and to sufficient quality.

Ofgem has sought to mitigate these barriers by introducing additional flexibility of roles and responsibilities for generators and OFTOs under an extended OFTO build framework (in relation to the late OFTO build option).[78] Under the updated framework, generators can work with Ofgem to develop a tender option, which could include:

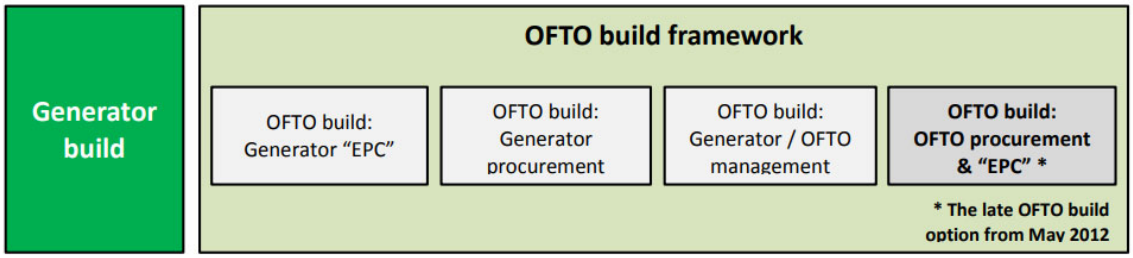
- **OFTO build:** Generator 'EPC' - The generator (or affiliated SPV) carries out all supply chain procurement and manages the construction of the transmission assets by entering into an EPC contract with the OFTO as asset owner. The generator (as EPC contractor to the OFTO) receives milestone payments from the OFTO to fund construction. The generator manages construction of

74 Department for Business, Energy & Industrial Strategy, Offshore Transmission Network Review: Enduring Regime and Multi-Purpose Interconnectors (September 2021).
75 Ofgem, Offshore Electricity Transmission: Cost Recovery Methodology for Tender Round 3 (February 2014).
76 Ofgem, Consultation on tender exercises under the enduring regime (December 2011), p. vii.
77 Ofgem, OFTO Build: Providing additional flexibility through an extended framework (December 2014).
78 Ofgem, OFTO Build: Providing additional flexibility through an extended framework (December 2014).

the asset under the terms of the EPC contract, providing the OFTO with protection against construction risk.

- **OFTO build:** Generator procurement – The generator carries out transmission asset supply chain procurement but the OFTO manages construction. The OFTO procures a third party (i.e. not the generator) EPC contractor (or contractors) to manage the sub-contractors procured by the generator and to protect the OFTO against construction risk. The OFTO procures the EPC contractor's services during the OFTO build tender process, signing the EPC contract at Licence Grant.
- OFTO build: Generator/OFTO management - Under this option the generator would split responsibility for the transmission assets into package(s) of assets it prefers more control over during construction; and other package(s) of assets the OFTO manages during construction.

Figure 5: OFTO build framework



Source: Ofgem, OFTO Build: Providing additional flexibility through an extended framework (December 2014).

In 2018,[79] Ofgem made a change to evaluating ITT submissions from scored robustness to threshold robustness. Previously, bids at the ITT stage were evaluated on first, passing five deliverability thresholds and then, bids were scored on price (with a 60% weighting of the overall score) and price deliverability robustness (with a 40% weighting of the overall score). After this change, bid evaluation involves giving the price (TRS) 100% weighting, and incorporating the price deliverability robustness requirements that were previously scored into existing thresholds. This means that the bidder that meets these thresholds and submits the lowest TRS becomes the preferred bidder. This change was implemented with the expectation of the following benefits being delivered:

- **Increase the competitiveness of bids** – the 100% weighting on price is intended to encourage qualifying bidders to seek the best value pricing solutions that result in a lower TRS, whilst also continuing to meet deliverability robustness thresholds.
- **Make evaluating bids more efficient** – this change removes the need to score deliverability robustness beyond meeting the threshold.
- **Maintain robustness and offset the risk of a preferred bidder being appointed without the required skills and capability to be an OFTO** – the introduction and raising of the required robustness threshold signals to all bidders that robustness is a pivotal component of each bid. It also addresses developers' wishes of a higher level of importance being placed on the OFTO's ability to operate the asset to a high standard.

Another proposed modification (2020) to the current tender model was in the timing of debt finance competition[80]. Under the current tender model, there is an 18-month period between submission of the ITT bid and financial close. This could cause challenges for debt providers, who must hold financing terms over this prolonged 18-month period, which could cause a barrier to entry to debt providers, and new equity investors in consequence. Ofgem proposed an alternative "two-stage" model, where bidders submit a TRS using standard debt finance terms common to all bidders. Once a

[79] Ofgem, OFTO Tender Process Changes for Future Tender rounds implemented for Tender Round 6 onwards (November 2018).

[80] Ofgem, Offshore Transmission Owner (OFTO) Regime Tender Process – Consultation concerning developments to the tender process within the current OFTO regime (November 2020).

Preferred Bidder is appointed, a debt funding competition would be held to establish the best pricing available from the market and determine the TRS.

Moreover, the UK Government has also noted that the introduction of onshore competition provides an opportunity to potentially remove the current regime's distinction between onshore and offshore competition and move towards a single integrated approach.[81]

3.9 Cost-benefit analysis conducted

CEPA (Cambridge Economic Policy Associates) conducted a Tender Round 2 and Tender Round 3 evaluation, with the following counterfactuals used to compare cost savings:[82]

Licensed merchant counterfactuals

1. **Counterfactual 1 –** the offshore generator is responsible for design, build, finance and operation of the assets with financing arrangements an entirely commercial relationship internal to the wind farm project (potentially using contestability)
2. **Counterfactual 2 –** the generation developer designs and constructs the asset, but a sale and leaseback arrangement are introduced for the ownership and operation for the transmission assets (using contestability).

Regulated price control counterfactuals

3. **Counterfactual 3 –** onshore TOs have their exclusive onshore transmission licenses extended offshore, and the offshore transmission services are included within the existing price control arrangements (no contestability)
4. **Counterfactual 4 –** where onshore TOs have exclusive onshore transmission licenses extended offshore, but a dedicated offshore price control (elements of which are fixed for longer periods than standard price control cycles) is applied to the offshore assets and offshore services (no contestability)
5. **Counterfactual 5 –** exclusive multi-zone licenses where the TO is licensed (potentially through a competitive tender) for an entire offshore zone and obligated to develop any future connections to shore (potentially using contestability).

Conclusions and outcomes of this CBA can be found in the below section 3.10.

3.10 Outcomes

Since 2009, awarding the ownership and operation of offshore wind network connections through a competitive tender process is estimated to have saved consumers in excess of £800 million.[83]

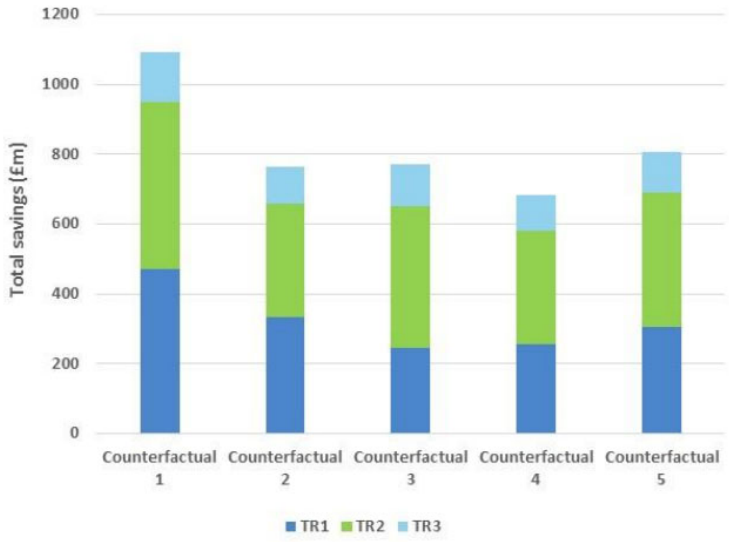
The first three tender rounds of the OFTO regime are estimated to have saved consumers in the region of £700m - £1.3bn to date on an NPV basis over 20 years.[84] The analysis, conducted by Ofgem in an evaluation of Tender rounds 2 and 3 concluded that the OFTO approach had achieved both financing and operating cost savings when compared to the counterfactual. In comparison to the merchant counterfactuals – higher financing costs relative to those outcomes achieved in TR2 and TR3 result from suboptimal allocation of risks than under the regulated OFTO approach, which creates a risk premium between the regimes. In comparison to the regulated price control counterfactuals – the financing savings arise from a combination of factors, which include competitive pressure applied to cost of equity, evidenced by declining equity IRR's between OFTO tender rounds and relative to regulatory benchmarks in other price-controlled sectors; and contestable processes which encourage

[81] Department for Business, Energy & Industrial Strategy, Offshore Transmission Network Review: Enduring Regime and Multi-Purpose Interconnectors (September 2021).
[82] CEPA & Ofgem, Evaluation of OFTO Tender Round 2 and 3 Benefits (18 March 2016).
[83] Department for Business, Energy and Industrial Strategy, Energy White Paper: Powering our Net Zero Future (December 2020).
[84] CEPA & Ofgem, Evaluation of OFTO Tender Round 2 and 3 Benefits (18 March 2016).

OFTO bidders to source optimal debt terms for each project. Overall, the primary driver behind cost savings is that bidders must compete against each other to offer a better deal on financing and operating costs, in comparison with monopoly network companies. Other cost reductions between tender rounds included increases in efficiency, fall in market rates of return and economies of scale arising from partially fixed operating costs.

As per the below diagram the savings generated by competition increased over rounds TR1 to TR3 (see explanation of counterfactual scenarios in section 3.9.

Figure 6: Total savings by tender round (£m NPV)



Source: CEPA & Ofgem, Evaluation of OFTO Tender Round 2 and 3 Benefits (18 March 2016).

Evidently, the delivered cost savings increased over each tender round regardless of the counterfactual scenario. The greatest cost savings are delivered in comparison to counterfactual 1 (licensed merchant counterfactual with internal financing arrangements).

The high-level drivers of cost savings can be reflected accordingly:

- **Contestability can drive lower cost** – the bidding process for OFTOs has facilitated the identification of the efficiency frontier for operating (and other) costs in the UK offshore transmission sector, quicker than relying on a single provider and regulatory negotiation-based price review processes. Competition between tender rounds has placed pressure on incumbents to improve the terms of their bids. This pressure would not exist under counterfactuals.
- **Contestability reduces asymmetry of information** – contestable OFTO process is expected to drive a better outcome than a regulatory negotiation is because is it reduces the need for regulatory judgement to be applied in setting return expectations. Instead, financeability of OFTOs is determined by the market.
- **Contestability drives innovation** – competition fosters innovation and new ideas, also improving delivery and long-term efficiency. This can not only occur in operating assets, but also in financing and maintaining them.

This contrasts with the following disadvantages of the contestable approach:

- It is possible the OFTO project-by-project tender process may have lost opportunities for coordination – in the regulated incumbent counterfactuals, a single operator or group of incumbents would have owned and operated a portfolio of offshore transmission projects. This approach may have allowed for coordination of benefits such as with management of operating costs, that are lost under a single project tender approach for OFTOs.

- Loss of future price flexibility – without price reviews, the ability to align revenues and costs in the future is lost because of the one-off nature of the competitive OFTO tender.
- Transaction costs due to the bid processes – While there may have been savings from the contestable processes in TR2 and TR3, a trade-off is the high bid/transaction costs as a percentage of asset value linked to the tender process.

In addition to the above findings, Ofgem has found that the annual performance of OFTOs suggests they are on average outperforming the availability target (which relates to the availability incentive described in section 3.5).[85] Since 2014, average availability for OFTO assets has been 99.19% demonstrating that, overall, OFTOs are well managed and there are few incidents or prolongation of incidents that have occurred that are within their reasonable control.

4. Onshore competition

Onshore competition in the delivery of transmission infrastructure is yet to be implemented in the UK, so learnings are inherently limited. However, proposals and discussions in relation to different models of contestability by the UK Government, Ofgem and the ESO highlight important considerations that may be applied to an expanded contestability framework across the NEM.

Design feature	Description
Scope of competitive tendering	Initially, the UK has focused on implementing a late competition model for onshore transmission – likely due to lower complexity and reduced bidder risk. However, Ofgem is now considering implementing an early competition model to drive innovation in transmission solutions and lower costs for consumers. The UK Government has highlighted that these benefits are particularly important given the significant demand for new and diverse transmission solutions to help the UK achieve its net zero emissions target.[86] At this point, Ofgem will focus the development of competition in onshore transmission on the early competition model (rather than a 'very early competition' model). This is due to the associated challenges that this model would cause for wider network planning, and the resulting complexity of assessing bids.[87]
Threshold for trigger contestability	The current criteria for late competition that is applied to LOTI projects is: 'new', 'separable' and 'high value' (at least £100 million of expected capex). This means that transmission upgrades are not eligible for competition. In determining whether it is appropriate to deliver the project via a late competition model, Ofgem will consider expected delays to project delivery and resulting impacts on consumers.[88] Although still being developed, it is likely that a different criterion will be applied to determine whether projects are eligible for early competition. Notably, a minimum value threshold may not be necessary if an effective project-specific competition CBA is in place. An initial competition CBA would give an early signal of whether there is likely to be any consumer detriment in pursuing early competition for a specific project, in terms of

85 Ofgem, Decision on developments to the tender process within the current OFTO Transmission Owner (OFTO) Regime (April 2021).
86 Department for Business, Energy & Industrial Strategy, Competition in Onshore Electricity Networks (October 2021).
87 Ofgem, Consultation on our views on Early Competition in onshore electricity transmission networks (August 2021).
88 Ofgem, Large Onshore Transmission Investments (LOTI) Re-opener Guidance and Submissions Requirements Document (March 2021).

Design feature	Description
	additional constraint costs arising from late delivery, and whether this is likely to offset the likely benefits of running an early competition.[89]
Procuring party	Ofgem considers that the ESO is best placed to run tenders for onshore transmission infrastructure,[90] however, the UK Government will give the Secretary of State the power to appoint bodies it deems suitable to run competitive tenders.[91] It has listed factors that it deems essential and desirable for the Secretary of State to consider when making an appointment decision.
Tender assessment criteria / process	Both proposed evaluation processes for early and late tendering for onshore transmission in the UK are staged in order to save costs and time. That is, both evaluation processes have an initial stage that attempts to minimise the number of bids that are assessed at the more rigorous evaluation stages.[92] A notable difference in the proposed evaluation processes is the current preference to exclude cost estimates at ITT stage 1 for an early competition tender. The rationale of this exclusion is to avoid creating perverse incentives on bidders to submit unrealistic figures or lead to a significant increase in the cost of producing a submission.
Risk management	For the late competition model, Ofgem has proposed various performance incentives for reliability, availability, connections and asset delivery, for example. These incentives should be tailored according to the size and complexity of each project. Revenue for the successful bidder will be fixed, subject to a limited number of adjustment mechanisms (for pre-defined and unknown events beyond the CATO's control). A CATO of Last Resort mechanism is also proposed to mitigate the risk of a CATO not being in place.[93] For the early competition model, Ofgem has proposed a 'Preliminary Works Cost Assessment' process to allow for revenue that was bid at ITT stage 2 to be adjusted as a result of preliminary works activities. It has also proposed a performance bond to address the low-risk but high-impact cost on consumers should the solution not be delivered.
Cost recovery	Ofgem is considering a 'Tender Revenue Stream' model for both late and early competition models (in contrast to the current model where onshore TOs receive revenue under the price control framework). Under this model, bidders are expected to bid the revenue they would expect to receive for delivering and operating their project over a fixed duration specified within the competition. The TRS would be aligned with the length of the network need that is being met.[94]
Coordination with the local TNSP	For late competition, local TOs may be involved in completing preliminary works, undertaking tender support activities, and may also decide to bid.

89 Ofgem, Consultation on our views on Early Competition in onshore electricity transmission networks (August 2021).
90 Ofgem, Consultation on our views on Early Competition in onshore electricity transmission networks (August 2021).
91 Department for Business, Energy & Industrial Strategy, Ofgem, Competition in Onshore Electricity Networks (October 2021).
92 Ofgem, Extending Competition in Electricity Transmission: Tender Models and Market Offering (August 2016).
93 Ofgem, Extending Competition in Electricity Transmission: Tender Models and Market Offering (August 2016).
94 Ofgem, Extending Competition in Electricity Transmission: Tender Models and Market Offering (August 2016).

Design feature	Description
	Conflict mitigation measures will be required for local TOs that decide to bid.[95] For early competition, there is an expectation that the local TO will have a role in assessing the impact of the shortlisted technical solutions at ITT stage 1 and a role in testing the impact of those solutions on their network. However, if incumbent TOs are permitted to participate as bidders, conflict mitigation measures will be required, or possibly connection feasibility assessments may need to be conducted by another party for e.g. the ESO.[96]
Cost-benefit analyses conducted	CBA for the late competition model indicated that associated costs are estimated at 4.2-10.8% of the value of projects involved, depending on the number and size of projects subject to competition. Ofgem conducted a qualitative assessment of benefits (savings made in capital, operation and financing costs). It relied on findings from the OFTO regime to predict that the late onshore competition model would deliver significant benefits, and ultimately these potential savings were likely to outweigh the costs.[97] CBA for the early competition model indicated that development costs for the model are estimated at £5.3 - 6.9m. Benefits estimated at 22% of project costs (taken from international precedents). This means that even if a £100m investment was spread over four tender processes, with no other early competitions ever being run, this benefit would almost certainly make the cost of developing the early competition model worthwhile.

4.1 Background

The Great Britain onshore electricity transmission network is currently planned, constructed, owned and operated by three transmission owners (**TOs**): National Grid Electricity Transmission plc (NGET) in England and Wales, Scottish Power Transmission plc (SPT) in the south of Scotland, and Scottish Hydro Electric Transmission plc (SSEN) in the north of Scotland. Ofgem regulates TOs through the price control (RIIO), setting funding allowances and allowable rates of return.

If new network requirements are foreseen by these companies, they can be submitted through the price control (RIIO) to Ofgem for approval. Network requirements and associated outputs and cost allowances can either be set at the start of a price control period, or during the course of a price control period, via what are referred to as 'uncertainty mechanisms'.

A relevant example for the RIIO-2 price control period (2021-28) is the Large Onshore Transmission Infrastructure (**LOTI**) process that electricity transmission owners can trigger if their project is worth £100M.

95 Ofgem, Extending competition in electricity transmission: Decision on criteria, pre-tender and conflict mitigation arrangements (November 2016).
96 Ofgem, Consultation on our views on Early Competition in onshore electricity transmission networks (August 2021).
97 Ofgem, Draft Impact Assessment on applying late competition to future new, separable and high value projects in electricity and gas networks during the RIIO2 period (December 2008).

4.2 Scope of competitive tendering

Late tendering

Ofgem has considered whether it is appropriate to apply late models of competition for LOTI projects within the RIIO-2 period.[98] However, the enabling legislation for late model competition has not yet been implemented. Ofgem has identified three late models of competition that could be applied: the Competitively Appointed Transmission Owner (**CATO**) regime, the Special Purpose Vehicle (**SPV**) model, and the Competition Proxy Model (**CPM**):

- The **Competitively Appointed Transmission Owner (CATO) model**: Under a late CATO build, the tender would be to construct, own and maintain assets after completion of the preliminary works (e.g., early design, consenting) for the project. CATOs will be subject to the same basic regulatory framework as all other TOs. Ofgem consulted on this model in 2016, however the legislation required to implement this model has not yet been made.
- The **Special Purpose Vehicle (SPV) model**: The TO would run a tender for the construction, financing and operation of the infrastructure through a project specific SPV. The SPV would deliver the project under the terms of a contractual arrangement with the TO, who would retain responsibility for and operational control of the project. The SPV would finance, construct and operate the infrastructure for a fixed period, potentially 25 years, in return for a defined revenue under its contract with the TO.
- The **Competition Proxy model**: The TO would deliver the project, but Ofgem would set the TO an allowed revenue in line with the outcome Ofgem consider would have resulted from an efficient competition for construction, financing and operation of the project. Ofgem would fix this revenue for an extended period, potentially 25 years. The revenue would be based on a determination of a weighted average cost of capital (WACC) for the duration of the revenue term and efficient costs for construction and operations. Ofgem would use appropriate benchmarks (e.g., from tenders that have been run in the offshore transmission sector) and reviews to determine these costs.

Ofgem considers that the CATO and SPV models have the potential to deliver greater consumer benefits than the CPM.[99] This is due to their potential to unlock additional savings for consumers by driving savings in capital and operational expenditure (e.g., introducing innovations in the delivery of projects due to a wider range of potential contractors and contracting strategies). Ofgem expects that it would only consider applying the CPM if the CATO or SPV models can be clearly shown as likely to cause unavoidable delays in delivery that would lead to material additional costs to consumers that offset any likely benefits derived from using these competition models.

Early tendering

Ofgem is currently consulting on an early competition scheme for onshore transmission. The rationale for introducing early competition is to minimise costs for consumers, foster innovation by inviting more parties to solve a transmission challenge and broaden the available pool of investment funds for transmission services and assets.[100] According to the UK Government, inclusion of early competition is important to reflect the fact that the electricity system is changing and will continue to change as different types of solutions have, and will, become available.

According to Ofgem, it is difficult to see how a very early competition model could be implemented without introducing a significant level of uncertainty and complexity to wider network planning and

98 See, for example: Ofgem, Yorkshire GREEN – Decision on the project's Initial Needs case and initial thinking on its suitability for competition (February 2022); Ofgem, Eastern HVDC – Consultation on the project's Initial Needs Case and initial thinking on its suitability for competition (May 2021).

99 Ofgem, Impact Assessment on applying late competition to future new, separable and high value projects in electricity and gas networks during the RIIO-2 period (2019).

100 Department for Business, Energy & Industrial Strategy, Competition in Onshore Electricity Networks (October 2021).

the tender evaluation process.[101] 'Very early competition' is where the tender takes place after the need has been identified but before potential solutions are identified, whereas 'early competition' is where the tender takes place slightly later, after an indicative solution has been identified. Early competition would be likely to deliver greater benefit to consumers rather than very early competition. The ESO concluded that without sensible limits on what solutions could win the competition and their impact on the design of the wider network, it would be very difficult to determine an appropriate winner.

The expectation is that Ofgem would make an assessment and decision on the type of competition that may be appropriate when a network constraint is identified. It will also take into account the impacts of competition on timelines and factor this into assessment of costs and benefits.

4.3 Threshold for triggering contestability

Late tendering

The current criteria for competition that is applied to LOTI projects is as follows:[102]

- **'New' -** A completely new transmission asset or a complete replacement of an existing transmission asset;
- **'Separable' -** The boundaries of ownership between these assets and other (existing) assets can be clearly delineated; and
- **'High value' -** £100 million of expected capital expenditure.

We note that the UK Government is currently consulting on whether the 'High value' monetary threshold remains appropriate.[103]

If the above criteria are met, the LOTI project moves to the second stage of Ofgem's assessment. This second stage considers whether the project should be delivered through any of the late models of competition (see section 4.1 above): the CATO regime, the SPV model, and the CPM. In determining whether the project should be delivered through a model of late competition, Ofgem will consider:

- the overarching RIIO-2 Impact Assessment on late competition, including any relevant new information;
- any relevant project-specific factors or circumstances (through a project-specific assessment of the consumer impact of applying the competition models);
- the impact on TO financeability.

Recently, for the Yorkshire Green Initial Needs Case, Ofgem noted that the ESO's LOTI CBA indicated that a one-year delay to the project would cost between £119- 392m across the Future Energy Scenarios (**FES**).[104] Accordingly, Ofgem concluded that any material delay resulting from the application of the CATO model on Yorkshire GREEN would not be in the interests of consumers, but did not rule out the use of the CATO model for any repackaged part of the project.

Early tendering

According to Ofgem's consultation paper on early competition (which considers the National Grid ESO's Early Competition Plan), Ofgem considers that early tendering should be available for projects that meet the following criteria:

- **Certainty** – Indicative solution is needed in at least two FES scenarios within the NOA

[101] Ofgem, Consultation on our views on Early Competition in onshore electricity transmission networks (August 2021).
[102] Ofgem, Large Onshore Transmission Investments (LOTI) Re-opener Guidance and Submissions Requirements Document (March 2021).
[103] Department for Business, Energy & Industrial Strategy, Competition in Onshore Electricity Networks (October 2021).
[104] Ofgem, Yorkshire GREEN – Decision on the project's Initial Needs case and initial thinking on its suitability for competition (February 2022).

- **Initial competition CBA** – Supports that running an early competition is likely to provide an outcome that is beneficial for consumers.[105]

Notably, Ofgem agreed with the ESO that a minimum value threshold (like the £100m threshold for late competition) is not necessary for early competition.[106] Ofgem noted the feedback from all three TOs that not including a value threshold would lead to uncertainty over what projects would progress to early competition. According to Ofgem, an effective project-specific competition CBA can mitigate the need for a value threshold, noting that the ESO is still considering how this CBA would work in practice. Ofgem has reserved its decision on whether there should be a value threshold to after the completion of the ESO's work on the competition CBA.

In contrast to the ESO's recommendation, Ofgem considers that the 'new' and 'separable' criteria are not as relevant or significant for early competition as for late competition. In early competition, the winning solution proposed by the successful bidder may be considerably different from the indicative solution being considered for early competition. It is therefore less clear why whether an indicative solution is new and separable or not should prevent a project from being considered for early competition. If there are additional costs associated with an indicative solution not being 'new' or 'separable' from the existing network, then it may be more appropriate to consider those alongside other costs and benefits as part of the initial competition CBA, rather than automatically ruling out indicative solutions that are not new and separable.

4.4 Procuring party

For the late CATO model, it seems that Ofgem would be the procuring party. For the proposed early competition scheme, Ofgem considers the ESO is best placed to run early competitions.[107]

The UK Secretary of State will be given the power to appoint bodies they deem suitable to run competitive tenders, allowing for the procuring party to be someone other than Ofgem.[108] The Secretary of State will be able to appoint one or more bodies to run different types of tenders, with the purpose of allowing the most appropriate body to be appointed, dependent on the type of competition the body appointed is to run.

The UK Government has recommended that the Secretary of State consider the following 'Essential Factors' in their appointment decision, and additional 'Desirable Factors'.

Essential Factor	Description	Indicators that the factor is met
Independence, actual/ perceived bias and conflicts of interest	The body needs to be sufficiently independent of potential bidders, incumbent network companies and potential network solutions, such that it can perform functions free from bias or a reasonable perception of bias or conflict of interest, in the interests of efficient network for Net Zero and consumers.	• Ownership structures • Reputation in industry • Interests in the constraint on the system that needs addressing • Interests in the solution • Financial benefits from competition
Economies of scale	One of the primary costs of competition is the cost of running the tenders. The centralisation of	• How much would the initial cost be to bring in the expertise the body requires, and do we think the body

[105] Ofgem, Consultation on our views on Early Competition in onshore electricity transmission networks (August 2021).
[106] Ofgem, Consultation on our views on Early Competition in onshore electricity transmission networks (August 2021).
[107] Ofgem, Consultation on our views on Early Competition in onshore electricity transmission networks (August 2021).
[108] Department for Business, Energy & Industrial Strategy, Ofgem, Competition in Onshore Electricity Networks (October 2021).

Essential Factor	Description	Indicators that the factor is met
	competition functions could, therefore, bring with it economies of scale and centralisation of expertise and culture. Where this centralisation is broadest, being both within and across the sectors, the cost efficiency would be expected to be maximised.	could be efficient at retaining that expertise and using it for future tenders? • Is there a repeatable pipeline of tenders that makes it less important if there is a high initial set up cost? • Does the body have the right incentives (e.g., a wider interest in ensuring efficient tenders as the outcome is linked to other objectives it has)?
Technical proficiency	A competition-running institution will need to have strong technical and commercial knowledge appropriate to the type of competition it is running. It needs to have a sufficient depth of experience (although we note that an institution running a competition could potentially bring in external expertise – e.g., through consultancy – where efficient, to advise in areas where it did not have the necessary expertise and/or resourcing).	• In-depth knowledge and expertise in the type of network issue, and possible solutions, technologies, licensing and legal frameworks that bidders will use/operate within. • In-depth knowledge and expertise in the commercial framework in which major infrastructure is developed and financed, including understanding of risk. • Relevant experience of running competitions. • Experience of commercially sensitive data management.

4.5 Tender assessment criteria / process

Late tendering

Based on consultation conducted by Ofgem on the late CATO model, Ofgem proposed the following process (with indicative timing) for assessing CATO tenders:[109]

Figure 7: UK Onshore competitive process

1. **Enhanced pre-qualification stage**: Allows Ofgem to select qualified bidders to take through to further tender stages on the basis of their financial standing, professional competence and capability. This would consider:
   - Basic bidder or bidder group pre-qualification identification information, financial and legal standing, and prior managerial experience
   - Evidence of a bidder's experience in delivery of infrastructure asset build and operation projects of similar size and scope to the project being tendered

[109] Ofgem, Extending Competition in Electricity Transmission: Tender Models and Market Offering (August 2016).

- Evidence of identification, understanding and management of project risk, particularly risks relating to cost escalation, overall financial robustness and quality and timeliness of project delivery and cost containment mitigations.

  Basic bidder information would be evaluated on a pass/fail basis, and then bidders' responses to a set of questions about their previous experience would be scored and weighted. The weightings would reflect the most relevant experience for the project.

2. **Outline Proposals (OP) stage**: Allows Ofgem to limit the number of bidders who can proceed to the ITT stage. Bidders would be required to provide the following information:

   - a demonstrable understanding of the complexity and requirements of the project being tendered, including in relation to statutory/regulatory compliance, delivery against consents, design, procurement, construction, operations and maintenance, and environmental and stakeholder management
   - approach to identifying and mitigating a range of project specific risks
   - a financial element, for example an indicative cost of capital for the project, for example through a bidder's proposed Internal Rate of Return and project gearing
   - approach for determining an appropriate economic and efficient funding solution.

     OP stage evaluation would consist of a scored and weighted set of questions, with the weighting emphasising the most important elements of the project. Bidders would need to reach a certain threshold score to be able to proceed to ITT.

3. **Invitation to tender (ITT) stage**: Finalise procurement arrangements and to produce a robust and high quality final bid. Ofgem's evaluation at the ITT stage would involve consideration of the following aspects:

   - Procurement management
   - Construction and operational management
   - Financial deliverability - fully developed funding solution for the project, including details of the sources of debt/equity, financial structure etc.
   - Tender revenue stream (**TRS**) – bidders would submit fixed price bids, which would set the CATO's TRS, subject to a limited number of reopeners and indexation.
   - Risk management, for e.g. in relation to design, technical, construction, operations

Responses to each of these sections would be scored (except for in relation to the TRS), and bidders must achieve minimum threshold scores for each section. For each of the above sections where a bidder has met the minimum threshold, the scores for these sections would then be aggregated, with a weighting applied to each section. The TRS would also be converted into a score. The score for the TRS would then be added to the combined score for the other sections to give an overall bid score. We consider that the weighting between the TRS and other sections could be equal (50:50) at the ITT stage to reflect the appropriate balance of deliverability and cost.

Early tendering

Ofgem has broadly agreed to the ESO's proposed approach to have three stages: Pre-qualification (**PQ**) stage, ITT stage 1 and ITT stage 2:

Pre-qualification (PQ) stage – bidders assessed on a range of criteria including financial capacity, technical capability and minimum corporate standards.

Invitation to Tender (ITT) stage 1 - involves a simple pass/fail assessment based on a minimum threshold score for each of the following four criteria:

1. Meeting the need: At a high level, bidders need to demonstrate that they 'meet the need' of that which is specified in the tender documents. Bidders need to undertake their own studies, of which the ESO will conduct shadow studies to verify their results. These studies should outline how much voltage or stability support and/or how much capacity their initial solution designs would provide.
2. Risk to network reliability: Solution must use technology that is undergoing active commissioning.
3. Deliverability: The procurement body will need to assess whether there are any deliverability issues with the initial solution design provided by the bidder. To do this, the procurement body will need to have some 'technical, design, planning and operating' expertise to determine those solutions which have failings.
4. Environmental and social impacts: Bidders' solutions are assessed for environmental and social impacts, which will be set together by BEIS, Ofgem and the Procurement Body. These expectations and minimum standards would be set out in the tender specification and may include a stipulated level of carbon intensity.

Ofgem was supportive of the ESO's proposed exclusion of cost estimates at ITT stage 1, since including this could either create perverse incentives on bidders to submit unrealistic figures or lead to a significant increase in the cost of producing a submission. Further, where there are a high number of bidders participating in ITT stage 1, relative scoring might be introduced to limit the number of solutions proceeding to ITT stage 2.

ITT stage 2 – assessment of bids that pass ITT stage 1, on both technical and commercial elements. The commercial assessment involves assessing bidder financial models, which would include their indicative Tender Revenue Stream (**TRS**). The technical assessment involves scoring bidders between 0 and 5, on the following factors:

- Deliverability and delivery plan
- Supply chain strategy
- Contract engineering, procurement and construction (EPC) and, operating and maintenance (O&M)
- Financing strategy
- Planning and consenting strategy
- Environmental impact
- Approach to costing
- Bid assessment.

The ESO's proposal is to integrate the technical scores bidders receive based on the plans they submit with the TRS. For the purposes of evaluating bids only, a pre-determined percentage of each bidder's TRS will be adjusted as a result of its overall technical score. This would result in a single 'Technical Adjusted TRS'. For example, if two bidders submit comparable TRS proposals, but one gets a higher technical score, this bidder would get a lower Technical Adjusted TRS. The bidder with the lowest Technical Adjusted TRS would be selected as the preferred bidder and progress to the PB stage.

4.6 Risk management

Late tendering

Ofgem has proposed performance incentives to reinforce CATO obligations under the regulatory framework, including in regard to the following aspects: [110]

[110] Ofgem, Extending Competition in Electricity Transmission: Tender Models and Market Offering (August 2016).

- Reliability: Availability-based financial incentive with penalties for poor performance and bonuses for outperformance to ensure CATOs' assets will be available when they are needed. This would complement a range of technical requirements and operational processes in the wider regulatory framework.
- Availability: Availability-based incentive and obligation to develop a Network Access Policy (NAP).
- Connections: Financial penalty worth up to 0.5% of annual base revenue for failure to meet obligations to connect additional users to the CATO's network.
- Asset delivery: 'Payment on completion' – CATO revenue stream typically starts once construction is complete.
- Environmental outcomes: SF6 incentive (to minimise leakage) – financial incentive based on performance against a target leakage rate. CATOs to report annually on transmission losses, business carbon footprint and work on visual amenity (where relevant, e.g. for new asset investment).
- Asset management: Periodic reporting on asset condition alongside a performance bond on asset condition at the end of the revenue term.

Ofgem has acknowledged that the above incentives might vary depending on the size and complexity of each project. It will consider bespoke approaches on a project-by-project basis, for example, potentially commencing revenue before construction is complete where the construction period is particularly lengthy.

In terms of risk allocation, Ofgem considered that CATOs should be exposed to the risks that it is economic and efficient for them to manage. Accordingly, CATOs would bear all risks associated with the tender process stage, construction and operation excluding the following:

- Delay or cancellation to the tender process (e.g. though changes to project need or planning)
- Change in required design (i.e. driven by change in need)
- Movements in financial markets between ITT and financial close
- Changes in business rates
- Changes in taxation (e.g. capital allowances)
- Demand risk/change in project need.
- Accordingly, Ofgem excepts to include licence mechanisms to allow for any adjustment to CATO revenue as result of unforeseen events:
- Mechanisms to adjust for specific pre-defined events beyond a CATO's control. This would include, for example, changes in business rates; and
- Mechanisms to adjust for unknown events beyond a CATO's control. Ofgem would make decisions on such events on a case-by-case basis, in line with our statutory duties.

Another important risk management mechanism is the CATO of Last Resort mechanism, to mitigate the risk of a CATO not being in place.[111] This may occur due to a lack of suitable bidders at different tender stages, poor quality bids that do not meet thresholds, and project delays or changes (e.g. if a planning consent application is unsuccessful).

Early tendering

Ofgem noted that the following aspects of the ESO's proposed approach to early competition could mitigate cost uncertainty faced by bidders and the risk of non-delivery:

- **'Preliminary Works Cost Assessment' (PPWCA) process**: As a result of the preliminary works activities there could be changes required to the design, costs and/or programme that was bid at ITT stage 2. These could for example be in relation to any conditions placed on the successful

[111] Ofgem, Extending Competition in Electricity Transmission: Tender Models and Market Offering (August 2016).

bidder as part of planning consent being granted, or due to site surveys resulting in adjustments to a route corridor. Rather than requiring bidders to price in the full range of risks they are likely to face during the preliminary works stage in an upfront bid, the PPWCA mechanism will allow for the successful bidders revenue to be adjusted to reflect the cost impact of certain changes occurring during the preliminary works phase. A PPWCA will be carried out towards the end of the preliminary works undertaken by the successful bidder, and any resulting TRS adjustments would be determined. An overall cap (likely set at a % of overall TRS proposed by the bidder) would be set to limit the cumulative cost change resulting from adjusted costs that are allowed.

- **Performance bond**: This would be forfeit if the successful bidder were to walk away before the project is operational, and would reduce the likelihood of a successful bidder walking away post-tender. This is intended to address the low-risk but high-impact cost on consumers should the solution not be delivered.

4.7 Cost recovery

Currently, onshore TOs receive allowed revenue under a price control framework. Across their relatively large portfolio of assets efficient TO costs are recovered over a 45-year asset depreciation period with an allowed rate of return (referred to as the Weighted Average Cost of Capital (WACC) based on an assumed level of gearing) applied to the value of the asset base each year. Under these arrangements, cost allowances, WACC and financial incentives are updated at regular intervals (currently 5 years for RIIO-2).

For the late CATO model, Ofgem has proposed that a CATO's revenue should be based on a bid tender revenue stream, fixed in general for a period of 25 years from completion of construction and indexed to inflation.[112]

Ofgem is also considering the TRS revenue model for early competition. Ofgem noted that the above regulatory revenue model is an appropriate approach for companies that have a relatively large asset base.[113] However, in the case of early competition, the selected commercial model will need to be suitable for a range of specific projects and must ensure that new entrants, who may only ever own a single project, are able to efficiently finance projects and effectively recover their costs. The ESO proposed a revenue model, known as a Tender Revenue Stream (**TRS**), where bidders are expected to bid the revenue they would expect to receive for delivering and operating their project over a fixed duration specified within the competition. The TRS would be aligned with the length of the network need that is being met, capped at a maximum of 45 years to reflect the revenue recovery period for TO assets under the RIIO price control framework.

The TRS would serve to ensure a level playing field wherever possible, and require bidders to commit to margins and overheads on construction and operation of their project, along with an underwritten equity commitment. Conversely, costs that may be deemed out of the control of the bidder may be updated after the tender process, such as through partially indexing costs (to inflation) or revising some costs after completion of the preliminary works. The TRS would be largely fixed following the completion of the preliminary works, subject only to adjustments as a result of performance against a certain limited number of incentives or where certain limited cost reopeners are triggered.

4.8 Coordination with the local TNSP

For late competition, local TOs may be involved in completing preliminary works, undertaking tender support activities, and may also decide to bid.[114] Conflict mitigation measures will be required for local TOs that decide to bid. This includes business and financial separation between the local TO and its bidding unit.

[112] Ofgem, Extending Competition in Electricity Transmission: Tender Models and Market Offering (August 2016).
[113] Ofgem, Consultation on our views on Early Competition in onshore electricity transmission networks (August 2021).
[114] Ofgem, Extending competition in electricity transmission: Decision on criteria, pre-tender and conflict mitigation arrangements (November 2016).

For early competition, there is an expectation that the local TO will have a role in assessing the impact of the shortlisted technical solutions at ITT stage 1 and a role in testing the impact of those solutions on their network.[115] However, if incumbent TOs are permitted to participate as bidders, conflict mitigation measures will be required (including ringfencing of TO bidding teams), or possibly connection feasibility assessments may even need to be conducted by another party for e.g. the ESO.

4.9 Model development / evolution

As part of Ofgem's Integrated Transmission Planning and Regulation project, CATOs were considered and consulted on. Ofgem focused on a late CATO model. In 2016, BEIS developed draft clauses to enable Ofgem to run competitive tenders for onshore transmission which met certain criteria. However these clauses were not introduced into parliament due to Brexit.

The UK Government cited the following changes to the electricity system since 2016 that highlight the need to build on the competitive framework previously put forward and considered by stakeholders and proceed to implement changes in legislation to allow for different competition models for onshore transmission:

- **In 2019, the UK committed to achieving net zero emissions by 2050**. To achieve this and related emissions reduction targets, significant transmission will be necessary and will need to happen at pace. Given the scale of change required to achieve net zero emissions and the level of investment required, competition is essential to further drive efficiencies and provide the best price for consumers while ensuring the necessary scale and pace of change.
- **There have been notable changes in technology available to manage constraints and to reinforce the existing network**. This includes a greater range of available smart and flexible technologies and services, which are becoming more market-ready. This means that solutions to network constraints are not restricted to new network build but can include other solutions, like aggregation or storage.
- **National Grid ESO became a legally separate entity within the National Grid group in 2019**. This creates an environment where bodies other than Ofgem may be appropriately positioned to run tender processes in the future, or to provide advice which was not previously considered.

4.10 Cost-benefit analysis conducted

Cost-benefit analyses have been conducted for both the late CATO and early competition models.[116] Benefits considered included: encouragement of innovation (particularly including novel non-network solutions for early competition) resulting in lower costs and better value for consumers as bidders pursue the creation of innovative solutions to submit competitive bids, downward pressure on capital and operational costs elsewhere on the network where competition was not previously applied, and access to efficient financing solutions. Costs considered included: late competition design costs, pre-tender costs (costs of setting up a late competition), tender costs (costs of running the tender), successful bidder costs, and risk of project delays and non-delivery.

The ESO's CBA for early competition indicated that it would take a very limited level of investment being subject to early competition before the expected benefits that early competition can deliver are likely to comfortably exceed the estimated development costs of £5.3m - £6.9m.[117] Ofgem concluded that "given the pipeline of projects might meet the criteria for early competition and be considered suitable following a CBA, the potential savings [of early competition]… are likely to far exceed the development costs".[118]

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115 Ofgem, Consultation on our views on Early Competition in onshore electricity transmission networks (August 2021).

116 Ofgem, Draft Impact Assessment on applying late competition to future new, separable and high value projects in electricity and gas networks during the RIIO2 period (December 2008).

117 Ofgem, Impact Assessment on developing arrangements to allow for early competition to be applied to future projects on the onshore electricity transmission network (August 2021).

118 Ofgem, Impact Assessment on developing arrangements to allow for early competition to be applied to future projects on the onshore electricity transmission network (August 2021).

The counterfactual used for the CBA represents the continuation of the 'status quo' arrangements for the delivery of electricity transmission network projects.[119] The incumbent network licensees would design, construct and operate the projects within their respective regions and this would be regulated under the status quo RIIO arrangements. Ofgem may alternatively decide, before construction begins, to apply a late model of competition to the project in question. This represents the 'status quo' or 'do nothing' option and would either involve the incumbent licensees receiving revenue for delivering the entire project in line with the prevailing price control arrangements, or revenue for the project being split between the incumbent licensee (preconstruction period) and a competitively appointed party (construction and operations period). Under the counterfactual it is assumed that non-network solutions continue to be able to compete in the ESO's Pathfinder processes as they do currently.

[119] Ofgem, Impact Assessment on developing arrangements to allow for early competition to be applied to future projects on the onshore electricity transmission network (August 2021).

United States

Historically, transmission projects in the US were constructed by incumbent transmission owners who enjoyed broad rights of first refusal.[120] This limited competition as these parties had a non-competitive right to provide a project, known as the right of first refusal (**ROFR**). This changed with the introduction of the Federal Energy Regulatory Commission (**FERC**) Order No. 1000 (**Order No. 1000**) in 2011, which introduced the requirement for competitive processes in selected transmission investments. The Order requires that there be "*opportunities for non-incumbent transmission developers to propose and develop regional transmission facilities through competitive transmission planning processes*".

Under Order No. 1000, the ROFR is retained for:

- upgrades;
- local projects for cost allocation purposes (i.e. located solely within an incumbent's retail distribution service territory that are not selected in the regional transmission plan);
- immediate need reliability projects;
- state-granted ROFR.

All transmission projects within the Independent System Operator (**ISO**) / Regional Transmission Owner (**RTO**) regions are subject to the FERC and the requirements within the Order. Notably, ERCOT is not part of FERC's jurisdiction thus the Order does not apply.

In assessing new transmission investments, each ISO/RTO has a set of defined criteria that is used to trigger a competitive process for projects within their region. These criteria are set out in the following sections.

120 The Brattle Group, Cost Savings Offered by Competition in Electric Transmission, (April, 2019).

5. PJM

Design feature	Description
Scope of competitive tendering	The PJM contestability model is a form of 'very-early' competition, in which the procuring party (PJM) identifies a need for a solution (called a 'violation') to address either 'Reliability', 'Market Efficiency' or 'Public Policy' in the transmission network – after which it conducts a review of which of these violations will be subject to competition.[121] Following this, it will open a 'proposal window', inviting incumbent and non-incumbents to submit solutions. These parties are responsible for design of the solution, all the way to construction. [122] Also, unlike models in the UK, there can be multiple bidders who are awarded partial components of the project.
Threshold for trigger contestability	PJM provides 'exclusions' to competition, which entail those projects that are below 200kv, immediate-need reliability projects of which there is insufficient time to conduct a proposal window, and substation work.[123] If a project fulfills any of these exclusions, it is exempt from the competitive process. Unlike some contestability models of which only 'high value' projects are subject to competition (and transmission upgrades are not eligible), PJM's exclusion model means that many upgrades to the existing network are included in the competitive planning process.
Procuring party	The procuring party is PJM (authorised as a regional transmission organisation (**RTO**) by the FERC), with some aspects of the selection process submitted to external parties for review (such as TEAC – Transmission Expansion Advisory Committee). PJM plays an extremely active and involved role in the procurement process, being responsible for assessing proposals, conducting qualitative/quantitative comparative cost analysis, and facilitating tenders. After conducting its analyses and evaluations of proposals, PJM presents their findings to the TEAC for their review.[124]
Tender assessment criteria / process	Solutions can be classified as 'Reliability', 'Market Efficiency' or 'Public Policy' – known as 'Criteria Drivers', with projects bid to address one of these three drivers. Each of these drivers has their own assessment criteria and process, as they vary quite greatly in their demands. However, a common component of the assessment process that applies to all projects is the implementation of a 'comparative cost framework'. This is used to evaluate the costs and risks of proposals, and to compare the costs of those which address the same violation(s) or constraint(s). [125]

121 PJM interconnection, PJM Competitive Planning process (April 2022).
122 PJM interconnection, PJM Competitive Planning process (April 2022).
123 PJM interconnection, PJM Competitive Planning process (April 2022), p 23. section 5.3.1.
124 PJM interconnection, PJM Competitive Planning process (April 2022).
125 PJM interconnection, PJM Competitive Planning process (April 2022).

Design feature	Description
Risk management	Cost escalation risks, schedule delay risks and project development risks (such as siting and permitting) are considered during the final selection process. PJM assess the applicable risks, considers the impacts on the execution of each project, and considers the results of such analysis in the selection decision. Hence, risk is identified and managed through the selection process.[126] Cost escalation risks can be addressed in bidder proposals through cost containment commitments. These cost commitments can include binding cost commitments, related to caps on costs such as construction, capital structure etc.[127]
Funding	As PJM follows an early competition model, the variability of project and project solutions demand unique funding mixes. These funding mixes are outlined in bidder proposal cost commitments, and components such as capital structure (debt to equity ratio), debt costs, total capital costs and required ROE are assessed in the comparative cost framework.[128]
Cost recovery	If a TO is designated by the Regional Transmission Expansion Plan to construct, own and/or finance a Required Transmission Enhancement, the TO may choose any of the following two cost recovery mechanisms[129,130]: 'Formula Rate Tariffs' or 'Fixed/Stated Rates'. The majority of PJM TOs use formula rates which mean that their rates are based on a formula that permit the recovery of the costs to provide transmission service. Some TOs use fixed rates, where rates remain constant unless they are changed through a cost-based rate filing at the FERC with cost support.[131,132]
Model development / evolution	The most notable development to the competitive planning process occurred in 2019, with the introduction of the 'Comparative Cost Framework'. This came after a recommendation by Vice President, Federal Government Policy Craig A. Glazer, to provide greater clarity about how cost commitments contained within proposals should be evaluated and how proposals with/without cost caps should be compared.[133] The comparative cost framework, which forms a key step in the evaluation process, addresses many of the concerns raised by Glazer.
Cost-benefit analysis conducted	While no formal cost-benefit analysis of the PJM competitive/sponsorship model has been conducted, there has been ongoing, high-level qualitative feedback on the benefits and disadvantages. For the disadvantages, this was centred around cost and effort required not only from the perspective of bidders (formulating complex technical proposals), but also for PJM to coordinate and evaluate these proposals.[134] The obvious advantage is in the form of technological innovation and diverse solutions induced by competition, particularly for 'Market Efficiency' congestion projects which in the past had not been given as much consideration.

126 PJM interconnection, PJM Competitive Planning process (April 2022).
127 PJM interconnection, PJM Competitive Planning process (April 2022).
128 PJM interconnection, PJM Competitive Planning process (April 2022).
129 PSEG , Cost Allocation Educational Session (June 2016).
130 PJM interconnection, PJM Open Access Transmission Tariffs (September 2010).
131 PSEG , Cost Allocation Educational Session (June 2016).
132 PJM interconnection, PJM Open Access Transmission Tariffs (September 2010).
133 S. Herling, F. Koza & P. McGlynn, The Sponsorship Model: Competitive Construction of Transmission Facilities in PJM Interconnection, IEEE Power and Energy Magazine 14:4 (2016), pp. 65-71.
134 S. Herling, F. Koza & P. McGlynn, The Sponsorship Model: Competitive Construction of Transmission Facilities in PJM Interconnection, IEEE Power and Energy Magazine 14:4 (2016), pp. 65-71.

Design feature	Description
Outcomes	The vast majority of projects that have been proposed and selected in the PJM competitive planning process have been for upgrades to existing facilities (135 upgrade projects and 7 greenfield projects out of 142 from 2013-2017). Of the total 142 projects, only three were awarded to non-incumbents.[135] These three projects were all greenfield projects, hence three out of 7 greenfield projects were awarded to non-incumbents. This calls into question the need for a competitive process for upgrades to existing assets, but also highlights the benefit of competition for greenfield projects.

5.1 Scope of competitive tendering

The PJM contestability model is a form of 'very-early' competition, in which the procuring party (PJM) identifies a need for a solution (called a 'violation') to address either 'Reliability', 'Market Efficiency' or 'Public Policy' in the transmission network – after which it conducts a review of which of these violations will be subject to competition.[136] Following this, it will open a 'proposal window', inviting incumbent and non-incumbents to submit solutions. These parties are responsible for design of the solution, all the way to construction. Also, unlike models in the UK, there can be multiple bidders who are awarded partial components of the project.

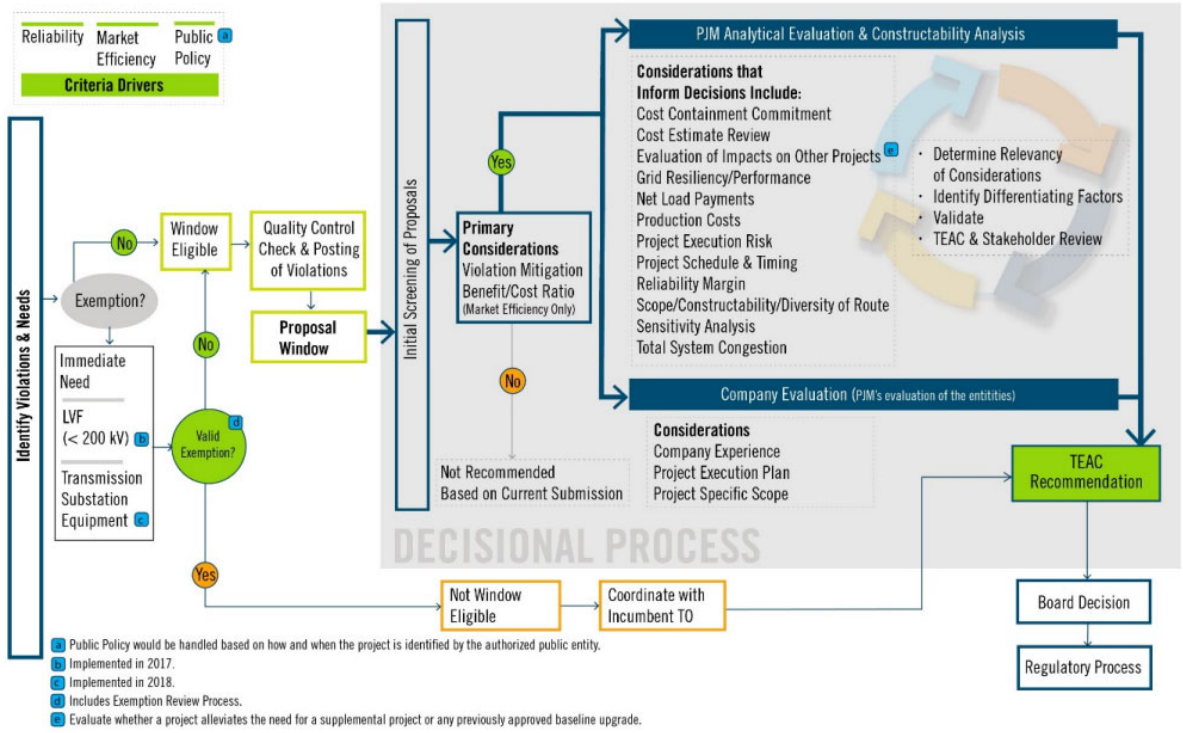
PJM uses Regional Transmission Expansion Plan (**RTEP**) windows to seek technical solution proposals to solve identified:[137]

- reliability criteria violations in accordance with all applicable planning criteria mandated by PJM, NERC, SERC, RFC and Local Transmission Owners,
- economic constraints or RPM limits and
- public policy requirements.

This is therefore a form of 'very early' competition.

[135] P.L. Joskow, Competition for Electric Transmission Projects in the US: FERC Order 1000 (MIT Centre for Energy and Environmental Policy Research: 2019).
[136] PJM interconnection, PJM Competitive Planning process (April 2022).
[137] PJM interconnection, PJM Competitive Planning process (April 2022).

Figure 8: PJM Planning Process



After PJM identifies potential violations and needs, it initiates a review on which of these violations are expected to be included or excluded from the competitive planning process (exclusions discussed in the next section).

5.2 Threshold for triggering contestability

Once PJM identifies violations and needs, violations are excluded from competition under the following conditions:[138]

- **Facility is below 200 kV (lower voltage facilities)**, except if either of the following apply:
  - i) The reliability violations are thermal overload violations identified on multiple facilities rated below 200 kV that are impacted by a common contingent element such that the multiple reliability violations could be addresses by one or more solutions, including but not limited to a higher voltage solution; or
  - ii) The reliability violation are thermal overload violations on multiple facilities rated below 200 kV that given the location and electrical features of the violations, one or more solutions could potentially address or reduce the flow on multiple lower voltage facilities, thereby eliminating the multiple reliability violations.
- **Immediate-need reliability projects:** Needed in less than 3 years. Projects that are 'immediate-need' are designated to the incumbent.
- **Substation work:** Thermal reliability violations on transmission substation equipment that can be solved by an upgrade to an existing transmission facility in a substation.

[138] PJM interconnection, PJM Competitive Planning process (April 2022).

5.3 Procuring party

The procuring party is PJM (authorised as a regional transmission organisation (**RTO**) by the FERC), with some aspects of the selection process submitted to external parties for review (such as Transmission Expansion Advisory Committee (**TEAC**)).[139]

PJM also conducts assessments of proposals, according to the criteria and process outlined in the below section 5.4. Their role includes qualitative and quantitative analysis of proposed solutions, including performing financial analysis in a 'comparative cost framework analysis' (see below section 5.3) For a set of identified competing projects, PJM performs financial analysis using the following non-exhaustive list of defined inputs: 'feedback from the detailed feasibility review; data and information from the project proposals submitted to PJM; and financial input assumptions and cost commitment exclusions'. Financial inputs include ROE, capital structure, debt cost, ongoing capital expenditure, tax rates etc. The estimated costs of project proposals will be compared using the Net Present Value (**NPV**) of the annual revenue requirements over the life of each project proposal. Upon completion of this financial analyses, PJM presents advises TEAC of the key inputs, and presents results to stakeholders.[140]

The above role (amongst many other roles) shows the deep level of involvement the procuring body takes in the competitive process. As transmission assets are subject to such early-stage competition, rigorous assessment is required throughout the entirety of the process.

5.4 Tender assessment criteria / process

Pre-qualification process

An entity's eligibility is evaluated based on its technical and engineering qualifications, including its ability to develop, construct, operate and maintain transmission within the PJM region.[141] If the entity does not have experience in a specific area, PJM requires that it provide a detailed plan for leveraging the experience of affiliates and/or contractors.

Criteria drivers

Criteria driver classification type is based on the nature of the project driver; however, baseline criteria drivers include **reliability, market efficiency and public policy.**[142] Projects are bid to facilitate one of the above drivers. The project evaluation process focuses on project submissions that result from the competitive planning process for either Reliability Criteria and/or Market Efficiency Criteria.

Reliability criteria tests include, but are not limited to:

- Baseline Thermal and Voltage N-1 Contingency Analysis
- Generator Deliverability and Common Mode Thermal Analysis
- Load Deliverability Thermal and Voltage Analysis
- N-1-1 Thermal and Voltage Analysis
- Transmission Owner Criteria
- Congestion Analysis
- RPM Analysis.

139 PJM interconnection, PJM Competitive Planning process (April 2022).
140 PJM interconnection, PJM Competitive Planning process (April 2022).
141 PJM interconnection, PJM Competitive Planning process (April 2022).
142 Note: There is little information available for Public Policy proposal evaluation criterion.

Reliability criteria project evaluation

Following submission of project proposals through an open proposal process, PJM undertakes a 'preliminary analytical quality assessment' of the project proposals received.[143] It uses the following factors to perform initial review and screening of reliability project submissions:

Stage	Description
Initial Performance Review	PJM evaluates whether the project proposal solves the required reliability criteria drivers that were posted as part of the open solicitation process. Competing projects that share comparable scope and cost may be organised into logical groups. In general, project proposals will pass the initial reliability performance review if they show 'acceptable system performance' and do not create any additional problems for the initial power flow, short circuit or dynamic stability tests. If a proposal does not pass initial performance review, it will not be recommended based on its current submission.
Initial Planning Level Cost Review	PJM reviews the submitted project cost by the by the project sponsor (bidder) in addition to any cost contain mechanisms relevant to the proposal. Competing projects that address similar criteria violations may be sorted into logical groups for evaluation. Project cost estimates and scope are evaluated based on reasonableness, compared with projects of similar scope and magnitude.
Initial Feasibility Review	PJM reviews the overall proposed implementation plan and determines if the project can feasibly be constructed as proposed. This will include consideration of physical aspects, permitting, required approvals and overall timing,

Detailed proposal review

PJM then conducts a detailed proposal review focusing on 'violation mitigation':[144]

Stage	Description
Detailed Performance Review	PJM examines selected proposals for performance with respect to all performance criteria that proposals are anticipated to impact. PJM evaluates any applicable criteria that may impact performance measurement of the project. This contrasts with initial screening review, that only examined the analysis that was performed by the project sponsors (bidders).
Detailed Planning Level Cost Review	PJM performs a review of total project costs, cost estimates submitted by the project sponsor and review of cost estimates that may be provided for upgrade work related to the proposed project. This upgrade work would be performed by the affected incumbent TO(s). PJM also evaluates the benefits of any cost containment mechanisms and may also engage an independent consultant to assess the potential benefit of any cost containment/commitment.

[143] PJM interconnection, PJM Competitive Planning process (April 2022).
[144] PJM interconnection, PJM Competitive Planning process (April 2022).

Stage	Description
Detailed Feasibility Review	PJM may perform an in-depth review of the constructability of the project – typically including an evaluation of project scope, complexity and constructability factors that impact the project cost and/or schedule including but not limited to right-of-way acquisition, land acquisition, siting and permitting requirements, project complexity, project coordination complexity, outage coordination and project schedule.

Decision process and project recommendation

A separate entity is required to review decisions – the TEAC. The TEAC is responsible for review of each project finalists' proposal, Transmission Owner Upgrades, and a PJM-completed comparative framework demonstrating comparative risks to be borne by ratepayers as a result of the proposed binding cost commitment/use of non-binding cost estimates.

PJM retains the ability to select the project based on all relevant factors, with their rationale with respect to the evaluation process and resulting decision explained/reviewed by TEAC. This will invite an opportunity to provide feedback related to each proposal window.

In parallel to the above-mentioned analytical evaluations, PJM also performs a 'planning level company evaluation' to ensure the bidding entity possess the ability to design, construct, own, operate and maintain the proposed solution. Considerations include:

- Project specific scope
- Company experience and capability
- Project Execution Plan
- Project operations and Maintenance plan

Market Efficiency Project Evaluation

Projects assessed on the basis of Market Efficiency have their own set of criteria and drivers:[145]

Primary considerations

All submitted proposals will be reviewed to determine which of the PJM identified 'congestion drivers' are addressed by the proposal. Congestion drivers can be either energy market congestion or Reliability Pricing Model (RPM) economic constraints. If the proposal does not significantly address a PJM identified congestion driver or is substantially deficient, it will be rejected, and PJM will notify the proposer.

Eligible energy market congestion drivers

PJM identifies eligible congestion drivers for which market efficiency proposals will need to address and will be evaluated against. PJM considers 'all binding flowgates internal to the PJM footprint (including tie lines), current active Market-to-Market flowgates listed in the NERC book of flowgates, and potential future Market-to-Market flowgates between PJM and MISO' in determining eligible energy market congestion drivers.

Eligible Reliability Pricing Model (RPM) economic constraints

The RPM is PJM's 'resource adequacy construct,'[146] that aligns the price paid for capacity with overall system reliability requirements. This includes pricing that quantifies the 'locational value' and

[145] PJM interconnection, PJM Competitive Planning process (April 2022).
[146] PJM interconnection, RPM 101 Overview of Reliability Pricing Model (2017).

'operational value' of capacity. Resource adequacy refers to the amount of Capacity Resources that are required to serve the forecast load and satisfy the PJM reliability criterion.

Congestion Mitigation

A market efficiency proposal must 'substantially relieve congestion on one or more PJM identified congestion drivers'. In this context, substantial relief is determined as either:

- At least 50% of the modelled congestion on the identified flowgate or
- An annual average congestion reduction of $1 million on the identified flowgate.

Benefit/Cost (B/C)

Market efficiency proposal addressing one or more identified congestion driver must meet a B/C ratio threshold of at least 1.25:1. A proposal that does not meet this minimum B/C threshold will not proceed further in the analysis as a stand-alone proposal. However, the proposal or a portion of the proposal could be combined with other proposal(s) to address specific congestion issues.

Cost estimate review

For a market efficiency proposal with costs greater than $50 million, an independent review of such costs will be performed.[147]

Other considerations in Market Efficiency proposals include zonal/total savings, risk evaluation, sensitivity evaluation, reliability impact and outage impacts.

Comparative cost framework

PJM conducts a 'comparative cost framework' to evaluate the costs of project proposals. Once project proposals are seen to pass an engineering screen, the final comparative cost framework is performed. The comparative cost framework is a 'multi-step process' that calculates project costs and compares these costs across projects that address the same violation(s) or constraint(s).

This comparative cost framework forms part of the assessment process and involves assessing the details of the proposed cost commitment provision and corresponding cost estimate. This assessment may also include an appraisal of proposed project-specific risks, scope of the proposed project, estimated construction costs, risk of proposed costs exceeding the cost commitment provision, and risk of a sponsor's inability to complete the proposed project.

5.5 Risk management

Cost escalation risks, schedule delay risks and project development risks (such as siting and permitting) are considered during the final selection process.[148] PJM assess the applicable risks, considers the impacts on the execution of each project, and considers the results of such analysis in the selection decision.

Cost escalation risks may be addressed by including a cost containment provision in the project proposal. PJM will evaluate the risk mitigation of the cost containment provisions through a subjective analysis of the potential for cost escalation and the ability of the cost containment proposal to address the risk (for those aspects of the proposal for which the cost containment provisions apply). If the containment provision provides risk mitigation benefits, the proposal with this cost containment may be given preference in the selection process. In some cases, terms of a cost containment proposal (related to construction cost caps, project total return on equity and/or capital structure) can be binding. PJM selects projects with cost and 'binding cost' containment being one component.

147 PJM interconnection, PJM Competitive Planning process (April 2022).
148 PJM interconnection, PJM Competitive Planning process (April 2022).

Cost commitments are voluntary and if included in a proposal, must be accompanied by a detailed explanation of the proposed cost cap mechanism, with illustrative examples of those components of the total cost for bringing the project into service (including those that are intended to be covered by the cost cap, and those components that are not covered by the cost cap). This must also include the proposed 'contractual cost commitment language' detailing the terms of the cost commitment.

5.6 Funding

As bidders are competing and providing proposals at an early stage, with solutions (and their associated costs) varying quite greatly, there does not seem to be a prescribed or standard method of funding. However, in the comparative cost framework, PJM financially assesses proposals with cost commitment provisions based on their capital structure, debt costs, and ROE (amongst other inputs).[149] This would imply that bidders have the discretion as to their funding mix (equity, private debt, etc.), and are incentivised to minimise funding costs to make their proposal more cost favourable.

5.7 Cost recovery

If a TO is designated by the Regional Transmission Expansion Plan to construct, own and/or finance a Required Transmission Enhancement, the TO may choose any of the following cost recovery mechanisms to recover costs through one of two mechanisms:[150,151]

- **Formula rate tariffs:** Majority of PJM TOs have formula rates which mean that their rates are based on a formula that permit the recovery of the costs to provide transmission service. The formula rates are updated annually to account for changes in expenses (including operations and maintenance) and the addition of new transmission investments etc. Formula rates include protocols that provide for transparency and interaction with affected customers.
- **Fixed / stated rates:** Some PJM TOs have fixed or stated rates, in which rates remain constant until they are changed through a cost-based rate filing at the FERC with cost support.

5.8 Model development / evolution

Cost cap development

In June 2016, Vice President Federal Government Policy Craig A. Glazer raised some issues surrounding cost caps proposals submitted by bidders. These included:[152]

- What consideration and weight should the RTO give in its selection process to cost estimates in general?
- Should cost estimates be discounted heavily as simply a 'best guess'?
- Should cost estimates be accepted on face value?
- Should developer cost estimates be set aside and instead have the RTO conduct its own cost estimate?
- When a cost cap is proposed by some developers and not others, should the cost cap be given a special weight?

In response to these issues, the following reforms (amongst others) were proposed for FERC's consideration:

1. **FERC guidance on consideration of cost commitments in the context of the Order No. 1000 processes**: Glazer proposed that the commission provide guidance through a policy statement or

149 PJM interconnection, PJM Competitive Planning process (April 2022).
150 PSEG , Cost Allocation Educational Session (June 2016).
151 PJM interconnection, PJM Open Access Transmission Tariffs (September 2010).
152 PJM interconnection, Competitive Transmission Development Technical Conference (2016).

other means, that clarifies the relationship of the cost cap with the ratemaking (revenue) process, and what type of costs can be considered in a cost cap.

2. **Recognising the trade-offs associated with binding cost caps**: Binding cost caps and adopting a rule that would enforce bidder's cost caps no matter the circumstances would impose a heavy risk premium on all submitted proposals

In effect, it was recommended that responsibility to interpret cost caps and their associated clauses should be more balanced with more involvement and guidance by the Commission. This would reduce the 'blurred lines' between the 'regulatory' and 'planning' roles, especially with respect to actual enforcement of cost caps – which they recommend should be through a regulatory process by a state public utility commission.

Introduction of the comparative cost framework

As outlined in section 5.7 above, PJM utilises a comparative cost framework to compare cost estimates in proposals that address the same constraints, with respect to cost caps and commitments. For those proposals without cost commitment provisions, PJM outline that they assess factors such as magnitude of proposed cost, estimated construction costs and annual revenue requirements. PJM also conducts financial analysis using inputs such as ROE, capital structure etc., and compares estimated costs of project proposals using the NPV of the annual revenue requirements over the life of each project proposal.

The comparative cost framework was initiated by a stakeholder motion, and came into effect January 202. It addresses many of the issues raised by Glazer in 2016, such as specifying that caps on O&M costs are not part of the PJM evaluation process for binding cost commitment proposals, while those related to construction cost caps, project total ROE and/or capital structure are part of the evaluation process.[153]

5.9 Cost-benefit analysis conducted

PJM sought feedback from stakeholders on its sponsorship model, in relation to which PJM noted:[154]

- Due to difficulties in relation to the transfer of large files for submitting proposals, PJM had to develop its own software for transferring proposals
- Due to the variety of proposals received, PJM had difficulties comparing them all and later standardized the templates used to document proposals in concertation with stakeholders
- Transparency remains a key concern in the selection process.

In relation to the overall process, PJM acknowledged the following:

- The sponsorship model entails a significant amount of work, far more than they expected would be required under a single-project solicitation model. The workload is greater on bidders making technical assessments and decisions on multiple alternatives instead of preparing a proposal for just one alternative.
- To perform the sponsorship model, this demands skills greater than what the traditional independent service operator planning staff would be expected to possess: constructability reviews, design and construction costs, financial aspects of project. The need to execute these analyses and acquire those skills from outside the PJM organisation created costs that contributed to the establishment of a proposal fee.
- The benefits of the early stage bid model depend greatly on the type of work required:

[153] PJM interconnection, PJM Competitive Planning process (April 2022).

[154] S. Herling, F. Koza & P. McGlynn, The Sponsorship Model: Competitive Construction of Transmission Facilities in PJM Interconnection, IEEE Power and Energy Magazine 14:4 (2016), pp. 65-71.

i) The inherent bidding process can mean that significant effort is devoted to small reliability issues for which solutions are relatively obvious and can be addressed by the incumbent without the effort of a competitive process.

ii) The benefits of early bid are more obvious with market-efficiency projects. PJM notes that without the early bid model 'there had not been much focus, in terms of approved transmission projects, on the issue of chronic congestion in the energy market'. Having a competitive process for market efficiency projects resulted in innovative projects that far exceeded the cost-benefit thresholds, which translate to substantial congestion savings to customers.

- Even though the workload is greater on bidders who must make technical assessments and decisions on multiple alternatives (instead of preparing a proposal for just one alternative), stakeholders voiced their preference for the early bid model.

PJM overall is satisfied with the 'sponsorship model' as developers contribute innovative technical solutions to the process and as they continue to receive positive feedback on the process. [155]

5.10 Outcomes

From the 16 RTEP competitive windows during 2013-2017, 142 projects were awarded to developers among 803 proposals submitted. Of these 803 proposals, 45% came from non-incumbents. However, of the 142 projects awarded, only three were awarded to non-incumbents. The likely reason is that about 95% of projects awarded were for upgrades to existing facilities. Whilst this may appear concerning – out of the 7 greenfield projects awarded, three (i.e., all of the projects awarded to non-incumbents) were awarded to non-incumbents.[156] This demonstrates the applicability of early competition and the ability of non-incumbents to compete at a greater level for new, greenfield projects, as opposed to with upgrades.

What is also interesting to note is that among PJM's various proposal windows, the apparent trend is that for those projects or violations with a limited range of potential solutions, the share of non-incumbent proposals was higher. On the contrary, for those projects with a wider range of potential solutions, there tended to be a greater proportion of incumbent proposals.[157]

[155] S. Herling, F. Koza & P. McGlynn, The Sponsorship Model: Competitive Construction of Transmission Facilities in PJM Interconnection, IEEE Power and Energy Magazine 14:4 (2016), pp. 65-71.

[156] P.L. Joskow, Competition for Electric Transmission Projects in the US: FERC Order 1000 (MIT Centre for Energy and Environmental Policy Research: 2019).

[157] FERC, Report on Transmission Investment Metrics (October 2017).

Table 3: Summary of PJM competitive tenders (2013-2017)

	Artificial Island (2013)	Market efficiency (2013)	2014 RTEP Proposal Window 1	2014 RTEP Proposal Window 2	2014/15 RTEP Long-Term Proposal Window	2015 RTEP Proposal Window 1	2016 RTEP Proposal Window 2	2016 RTEP Proposal Window 3	2016/17 RTEP Long-Term Proposal Window	2017 RTEP Proposal Window 1	2017 RTEP Proposal Window 2
Window	29 Apr-28 Jun	12 Aug-26 Sep	27 Jun-28 Jul	17 Oct – 17 Nov	30 oct-27 Feb	18 Jun-20 Jul	29 Jun-28 Jul	30 Sep-31 Oct	1 Nov-28 Feb	11 Jul – Aug 25	5 Aug-4 Sep
Objective	Operational performance	Market efficiency	Reliability criteria: thermal	Reliability criteria: thermal and voltage, TO criteria	Long-term reliability criteria: TO criteria; market efficiency	Reliability criteria: thermal and voltage	Reliability criteria: thermal and voltage, Generation Deliverability	Reliability criteria: Short Circuit violations along with Baseline Thermal and Generation Deliverability/Common Mode Outage for Winter conditions	Market efficiency	Reliability criteria: thermal and voltage, generation deliverability	TO thermal criteria, TO voltage criteria; light-load thermal and voltage
Flow gates (violations)	1	25	112	311	77	306	71	25	-	40	22
Total Proposals	26	17	106	79	118	91	87	29	96	51	23
Entities	7	6	15	14	22	9	13	7		10	4
Proposals approved by PJM board	1	1	22	34	16	20	4	6	4	8	6
Approved greenfield projects	1	0	0	4	0	0	-	-	0	0	0
Approved upgrade projects	1	1	22	30	16	20	-	-	4	8	6
Approved incumbent	1	1	22	33	16	20	4	6	4	8	6
Approved nonincumbent	1	0	0	1	0	0	0	0	0	0	0

Source: TEAC white papers, PJM planning process

An example of a successful non-incumbent proposal is the 'Artificial Island' reliability project, which in 2013 received 26 proposals, each representing a technologically diverse assortment of partial and complete solutions to reliability issues identified by PJM. The 'Artificial Island' project was a potentially serious stability issue at the Salem and Hope Creek Nuclear generating stations, representing a total of 3,447 MW (the biggest power generation site in all of PJM). PJM found that the non-incumbent's proposal had the lowest expected cost but less contingencies and exclusions – they were awarded 50% of the estimated cost of the entire project, comprising a static var compensation, substation upgrades and a new transformer.[158] This project today is nearing construction completion and serves as a success story for the competitive planning process.

Another example is the 2014/2015 long-term proposal window, where PJM solicited solutions for long-term transmission needs to address market congestion (i.e., market-efficiency projects). Market-efficiency projects need to attain a minimum benefit/cost ratio of 1.25, with the benefits attributed to transmission congestion reduction. The number of market-efficiency projects brought forward for implementation was very low before the introduction of early tendering. However, the 2014/15 window for market efficiency solicited more than 100 proposals, many of which contained significant benefit/cost ratios higher than the minimum thresholds and have been recommended for implementation.[159]

6. CAISO

Design feature	Description
Scope of competitive tendering	Competition is introduced at a late stage, with design solutions developed by CAISO to address Reliability, Public policy, and Economic needs. After this, CAISO competitively solicits proposals to finance, construct, own, operate and maintain transmission facilities. [160]
Threshold for trigger contestability	Regional transmission solutions (> 200 kV) identified in CAISO's annual transmission plan are eligible for competitive procurement if:[161] • CAPEX is greater than $50 million, or • CAPEX is less than $50 million and approval is gained from CAISO management. Upgrades to the network are excluded.
Procuring party	The procuring party is CAISO (authorised as a regional transmission organisation (RTO) by the FERC). Their network serves 80% of California and a small part of Nevada.
Tender assessment criteria/process	CAISO evaluates whether the project sponsor and proposals meet the qualifications for consideration, and take the steps necessary for selecting approved project sponsor(s).

158 CAISO, Tariff Section 24 - Comprehensive Transmission Planning Process (March 2022).

159 S. Herling, F. Koza & P. McGlynn, The Sponsorship Model: Competitive Construction of Transmission Facilities in PJM Interconnection, IEEE Power and Energy Magazine 14:4 (2016), pp. 65-71.

160 CAISO, Tariff Section 24 - Comprehensive Transmission Planning Process (March 2022).

161 FTI Consulting, Case Studies of Early Competition (November 2019).

Design feature	Description
Risk management	CAISO considers financial risks from the first phase of the project evaluating whether a project sponsor and its team have historically demonstrated the ability to assume liability for major losses through measures such as providing letters of credit, insurance policies, or showing sufficient financial ability to cover losses in the normal course of business.[162] Only proposals having met these criteria can be qualified for the second phase of the process. During the second phase of the project cost containment capabilities are assessed, and in case of an absence of cost-containment mechanism in the proposal, CAISO can consider whether they are willing to impose such a containment.
Cost recovery	Under policy-driven and economic planning assessments, costs are recovered through the TO's Transmission Revenue Requirement (TRR) which must be approved by FERC.[163]
Model development / evolution	In relation to joint proposals, the CAISO decided to require all collaboration to be done prior to submitting a proposal at the close of the bid window. Previously, the CAISO allowed a collaboration period after bids were submitted, however stakeholders raised concerns that this collaboration period extended the solicitation review period and added unnecessary delays to project sponsor selection.[164]
Cost-benefit analysis conducted	The Brattle Group found that for CAISO, between 2013 and 2019, the average cost advantage (i.e., the difference in cost between winning competitive bids and CAISO's estimate) was 29%.[165] Cost savings reflected in the selected competitive proposals can be attributed to a 'wide range of innovative approaches to transmission development', including innovative project designs, such as using new technologies for conductors, tower type, materials etc.
Outcomes	Over the eight transmission planning windows since 2013, only 16 projects have been subject to competitive solicitation.[166] The majority of these came in the 2013-2014 window, in which 10 projects were subject to competition. However, recently, the number of projects eligible for competitive solicitation has increased due to the increase in transmission requirements as a result of increasing renewable generation and forecast load growth. [167]

6.1 Scope of competitive tendering

Competition is introduced at a late stage, with design solutions developed by CAISO to address Reliability, Public policy, and Economic needs. After this, CAISO competitively solicits proposals to finance, construct, own, operate and maintain transmission facilities.

[162] CAISO, Business practice manual for transmission planning process (March 2022) pp 58, 5.4.1. Project Sponsor Qualification.
[163] CAISO, How Transmission Cost Recovery Through the Transmission Access Charge Works Today - Background white paper (2017).
[164] CAISO, Competitive Solicitation Process Enhancements, Draft Final Proposal (October 12, 2015) section 3.
[165] The Brattle Group, Cost Savings Offered by Competition in Electric Transmission: Experience to Date and the Potential for Additional Customer Value (2019).
[166] CAISO, Transmission Planning.
[167] CAISO, Revised Draft 2021-2022 Transmission Plan (2022).

6.2 Procuring party

The procuring party is CAISO (authorised as a regional transmission organisation (RTO) by the FERC). Their network serves 80 percent of California and a small part of Nevada.

6.3 Threshold for triggering contestability

Regional transmission solutions (> 200 kV) identified in CAISO's annual transmission plan are eligible for competitive procurement if:[168]

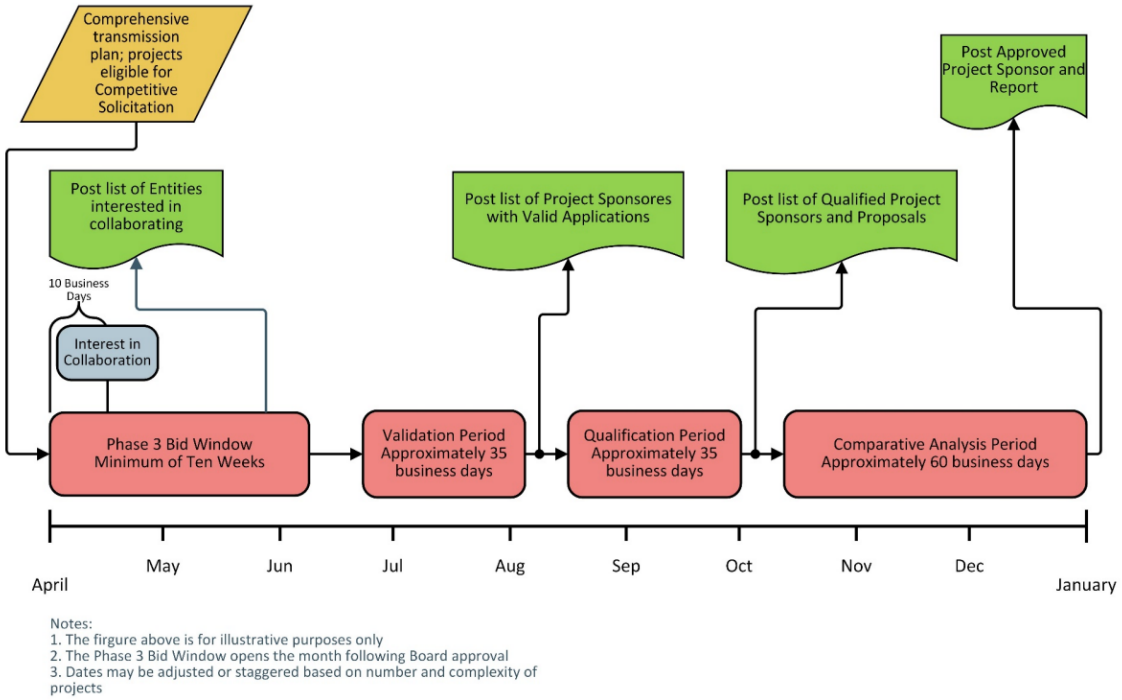
- CAPEX is greater than $50 million, or
- CAPEX is less than $50 million and approval is gained from CAISO management.

Any reliability solution identified in the transmission plan as a regional transmission facility and approved by the governing board is eligible for competitive solicitation – unless it constitutes an upgrade to an existing transmission facility.

6.4 Tender assessment criteria / process

The CAISO evaluates whether the project sponsor and proposals meet the qualifications for consideration and takes the steps necessary for selecting approved project sponsor(s) according to the CAISO tariff and business practice manual for the transmission planning process. The typical period between the bid window opening and the release of the Project Selection Report is nine months.[169]

Figure 9: Overview of CAISO Transmission Planning Process



Source: CAISO, Business Practice Manual for Transmission Planning Process

168 FTI Consulting, Case Studies of Early Competition (November 2019)

169 CAISO, Business Practice Manual for Transmission Planning Process (August 2021)

Selection criteria

To determine a selection criterion to apply to each relevant transmission solution subject to competitive solicitation, the CAISO considers:[170]

- the nature, scope, and urgency of the need for the transmission solution
- expected severity of siting or permitting challenges
- the size of the transmission solution, potential financial risk associated with the transmission solution, expected capital cost magnitude, cost overrun likelihood and the ability of the project sponsor to contain costs
- the degree of permitting, rights-of-way, construction, operation and maintenance difficulty
- risks associated with the construction, operation and maintenance of the transmission solution
- technical and engineering design difficulty or whether specific expertise in design or construction is required
- special circumstances or difficulty associated with topography, terrain or configuration
- specific facility technologies or materials associated with the transmission solution
- binding cost containment measures, including cost caps
- abandonment risk
- whether the overall cost of the transmission solution impacts CAISO's prior determination of, and inclusion in, its transmission plan of the more efficient or cost-effective solution.

6.5 Risk management

CAISO considers financial risks at the first phase of the tender process, considering for example whether the project sponsor has demonstrated the ability to assume liability for major losses resulting from failure of any part of the facilities associated with the transmission solution.

Only proposals having met these criteria can be qualified for the second phase of the process. During the second phase of the project cost containment capabilities are evaluated and in case of an absence of cost-containment mechanism in the proposal, CAISO can look at if they are willing to impose such a containment.[171]

6.6 Cost recovery

Costs are recovered through the TO's Transmission Revenue Requirement (**TRR**) which must be approved by FERC.[172] The TRR is recovered through a combination of regional and local access charges.

6.7 Model development / evolution

CAISO initially allowed a collaboration period after the bids were submitted. PG&E raised concern that the collaboration period extends the solicitation review period and needlessly delays project sponsor selection. Other stakeholders more or less agreed. CAISO implemented modified the application window to allow potential bidders interested in collaborating to announce themselves shortly after the bid window opens, and required all collaboration to be done prior to submitting an application at the close of the bid window.[173]

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170 CAISO, 2018–2019 Transmission Planning Process Phase 3: Competitive Solicitation (2019).
171 CAISO, Business Practice Manual for Transmission Planning Process (March 2022).
172 CAISO, How Transmission Cost Recovery Through the Transmission Access Charge Works Today - Background white paper (2017).
173 CAISO, Competitive Solicitation Process Enhancements, Draft Final Proposal (October 2015) section 3.

6.8 Cost-benefit analysis conducted

The Brattle Group in 2018 found that for CAISO, the average difference in cost between winning competitive bids and CAISO upper bound estimate was 29%, and 10% between the winning bid and CAISO lower bound estimate.[174] They explain that cost savings reflected in the selected competitive proposals can be attributed to a 'wide range of innovative approaches to transmission development'. These include innovative project designs, such as using new technologies for conductors, tower type, materials, and foundations; optimised routing to reduce permitting costs; innovative contracting; cost-control mechanisms (such as improved risk sharing with and incentives for the engineering and construction contractors).

6.9 Outcomes

Over the eight transmission planning windows since 2013, only 16 projects have been subject to competitive solicitation.[175] The majority of these came in the 2013-2014 window, in which 10 projects were subject to competition. However, recently, the number of projects eligible for competitive solicitation has increased due to the increase in transmission requirements as a result of increasing renewable generation and forecast load growth. [176] In the most recent 2021-2022 window, four projects were open for competitive solicitation. In this window, the CAISO found the need for 23 projects totalling $2,964 million, compared to the average over the last five years of $217 million.

Figure 10: CAISO example of bidder costs incurred

	Costs allocated to Horizon West Transmission, LLC Proposal 1	Costs allocated to Horizon West Transmission, LLC Proposal 2	Costs allocated to Horizon West Transmission, LLC Proposal 3	Costs allocated to Horizon West Transmission, LLC Proposal 4	Costs allocated to Horizon West Transmission, LLC Proposal 5
Validation	$ 12188.20	$ 12188.20	$ 12188.20	$ 12188.20	$ 12188.20
Qualification	$ 4308.65	$ 4308.65	$ 4308.65	$ 4308.65	$ 4308.65
Comparative Analysis	$ 34094.60	$ 34094.60	$ 34094.60	$ 34094.60	$ 34094.60
Total Costs:	**$ 50591.45**	**$ 50591.45**	**$ 50591.45**	**$ 50591.45**	**$ 50591.45**

[174] The Brattle Group, Cost Savings Offered by Competition in Electric Transmission: Experience to Date and the Potential for Additional Customer Value (2019).

[175] CAISO, Transmission Planning.

[176] CAISO, Revised Draft 2021-2022 Transmission Plan (2022).

7. MISO

Design feature	Description
Scope of competitive tendering	The Midcontinent Independent System Operator (**MISO**) is an independent Regional Transmission Organisation (**RTO**), responsible for managing and controlling a multi-state electricity network across the United States and Canada. In 2011, MISO established its Transmission Expansion Plan which developed a set of Multi-Value Projects (**MVP**).[177] MISO's Competitive Transmission Process is a process to select an entity to construct, own, operate and maintain transmission facilities. This is therefore a form of late competition.
Threshold for trigger contestability	MISO will apply contestability under the following conditions:[178] • **Multi-Value Projects (MEPs):** >$20 million and >100 kV • **Market efficiency projects:** >$5 million and >230 kV Contestability does not apply to projects under the following exclusions:[179] • Immediate need reliability project (need < 3 years) • Upgrades to existing facilities • Any state laws or regulations granting a right of first refusal to a TO.
Procuring party	MISO is the procuring party. It operates under a 'Competitive Transmission Executive Committee', which is an internal committee charged with overseeing MISO staff and consultants, involved in the implementation of the MISO Competitive Transmission Process.
Tender assessment criteria / process	The tender process starts with a pre-qualification stage. Applicants must demonstrate sufficient capabilities in relation to project implementation and operations, maintenance, repair, and replacement requirements. An RFP is then issued, after which MISO evaluates proposals and selects the winning bidder.[180]
Risk management	In assessing the 'Cost & Design' criteria for a given proposal, MISO will consider whether any binding cost containment measures are being offered in the cost estimates.
Cost recovery	Bidders must propose an estimated annual revenue requirement.
Model development / evolution	The voltage threshold for MEPs was lowered from 345 kV and above to 230 kV and above.[181] Further, in order to reduce time and money to prepare and evaluate proposals, the MISO introduced a revised RFP Template, as well as page limits for proposals. The MISO also introduced proposal window timelines according to project characteristics.[182]

177 Midcontinent Independent System Operator, Multi value projects.
178 Midcontinent Independent System Operator, Attachment_FF_-_Transmission_Expansion_Planning_Protocol (June 2022).
179 Midcontinent Independent System Operator, Attachment_FF_-_Transmission_Expansion_Planning_Protocol (June 2022).
180 Midcontinent Independent System Operator, Competitive transmission administration.
181 Concentric Energy Advisors, How transmission planning and cost allocation processes are inhibiting wind and solar development in SPP, MISO & PJM (2021).
182 Midcontinent Independent System Operator, Competitive Transmission Process Continuous Improvement Workshop II (July 2019).

Design feature	Description
Outcomes	Out of the first (the Duff-Coleman Project) of only two projects that MISO has competitively solicited (both being Market Efficiency Projects), MISO noted that bidders were highly qualified, but with high variance in the respective costs provided.[183] The MISO noted that many proposals had highly innovative cost containment measures, despite the ultimately winning bid exceeding MISO's cost estimate by 30%. In the second of the two projects (the Hartburg-Sabine project), the winning bid was awarded to a non-incumbent, with the highest total score (by a large margin), largely driven by cost/design and project implementation.[184] Benefit-to-cost ratios ranged between 1.37 and 2.34.

7.1 Scope of competitive tendering

The Midcontinent Independent System Operator (**MISO**) is an independent Regional Transmission Organisation (**RTO**), responsible for managing and controlling a multi-state electricity network across the United States and Canada. In 2011, MISO established its Transmission Expansion Plan which developed a set of Multi-Value Projects (**MVP**). This portfolio of projects reflects transmission solutions that provide reliability, economic and policy benefits on a region-wide basis, and is reviewed annually.[185]

MISO's Competitive Transmission Process is a process to select an entity to construct, own, operate and maintain transmission facilities.

7.2 Procuring party

MISO is the procuring party, and operates under a 'Competitive Transmission Executive Committee', which is an internal committee charged with overseeing MISO staff and consultants, involved in the implementation of the MISO Competitive Transmission Process.

7.3 Threshold for triggering contestability

MISO will apply contestability under the following conditions:[186]

- **Multi-Value Projects**: >$20 million and >100 kV
- **Market efficiency projects (MEPs)** (projects that address issues related to market transmission congestion): >$5 million and >230 kV

Contestability does not apply to projects under the following exclusions:

- Immediate need reliability project (need < 3 years)
- Upgrades to existing facilities
- Any state laws or regulations granting a right of first refusal to a TO.

Reliability projects in MISO's footprint are effectively not candidates for the competitive process as their costs are now allocated to the local zones instead of allocated through a regional sharing mechanism.[187] This change in cost allocation has greatly limited the scope of MISO's competitive

[183] Midcontinent Independent System Operator, SELECTION REPORT Duff-Coleman EHV 345 kV Competitive Transmission Project (2016).
[184] Midcontinent Independent System Operator, SELECTION REPORT Hartburg-Sabine Junction 500 kV Competitive Transmission Project (2018).
[185] MISO, Multi value projects.
[186] MISO, Attachment_FF_-_Transmission Expansion Planning Protocol (June 2022), p 47.
[187] The Brattle Group, Cost Savings Offered by Competition in Electric Transmission (2019).

process given that reliability projects account for the overwhelming majority of MISO-planned and approved transmission investments.

7.4 Tender assessment criteria / process

Pre-qualification

Applicants must demonstrate sufficient capabilities in relation to project implementation and operations, maintenance, repair and replacement requirements.[188] They must also demonstrate information that represents an acceptable level of financial and legal risk to rely on the applicant to implement the project. On a quarterly basis, a prequalification window opens to allow entities to apply to obtain a 'Qualified Transmission Developer' certification. Each Pre-qualification or 'Transmission Developer Application' must be accompanied by a non-refundable application fee of $20,000. MISO Staff will review all applications and provide the Competitive Transmission Executive Committee with their recommendations.

Request for Proposals

MISO will determine the proposal window based on characteristics of the project, and in general, the proposal window will match the complexity of the project with the complexity of the evaluation.

Figure 11: Indicative proposal windows based on characteristics

	INDICATIVE PROPOSAL WINDOW		
PROJECT CHARACTERISTICS	**90 Calendar Days**	**120 Calendar Days**	**165 Calendar Days**
Complex Routing/Siting (e.g., river crossings, wetlands, urban areas, etc.).	Low	Moderate	High
States/RTOs Impacted (Quantity)	1	2	2+
In-Service Date (years from MTEP)	3 - 4 years	4 - 5 years	5 years +
Facilities (Quantity)	1 Facility	1 - 2 Facilities	2+ Facilities (Lines and Substations)
Project Value (USD)	$5M - $40M	$40M - $80M	Over $80M

Table 6.1-1: Project characteristics aligning with Proposal Windows

Source: MISO Competitive Transmission Process Continuous Improvement, Workshop II July 18, 2019

In order to submit a proposal, bidders must pay MISO a refundable deposit, with the amount determined by MISO (not exceeding $100,000). The amount of the refundable deposit is reflective of a forecast of the cost to evaluate proposals. Proposals submitted are allocated a 'pro rata' portion of the actual expenses in implementing the competitive developer selection process incurred by MISO. Any shortfall between proposal deposits and MISO's pro rata expenses are billed to the relevant bidder. Any balance that remains in excess of the expenses will be refunded with interest on a pro rata basis for each proposal.

Evaluating proposals

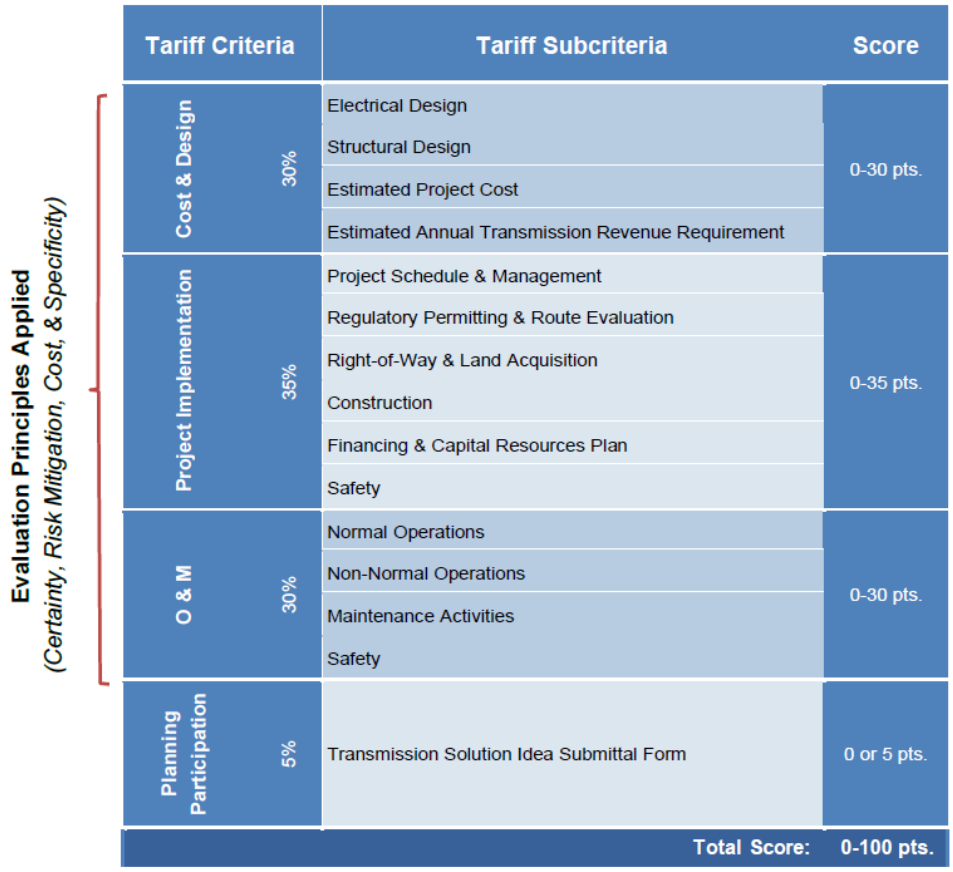
Proposals are scored according to four evaluation criteria: cost and design, project implementation, operation & maintenance, and planning participation. Depending on the type of project (transmission line, substation or project containing both types of facilities), MISO will apply three corresponding sets

[188] MISO, Competitive transmission administration.

of evaluation weightings. MISO then qualitatively comparatively categorises the proposal as 'Best' (and so on – 'Good', 'Acceptable', 'Unacceptable', for all other proposals) for each criterion.[189]

The evaluation scorecard for transmission line facilities, for example, is outlined below:

Figure 12: MISO Evaluation Scorecard example



Tariff Criteria		Tariff Subcriteria	Score
Cost & Design	30%	Electrical Design	0-30 pts.
		Structural Design	
		Estimated Project Cost	
		Estimated Annual Transmission Revenue Requirement	
Project Implementation	35%	Project Schedule & Management	0-35 pts.
		Regulatory Permitting & Route Evaluation	
		Right-of-Way & Land Acquisition	
		Construction	
		Financing & Capital Resources Plan	
		Safety	
O & M	30%	Normal Operations	0-30 pts.
		Non-Normal Operations	
		Maintenance Activities	
		Safety	
Planning Participation	5%	Transmission Solution Idea Submittal Form	0 or 5 pts.
		Total Score:	**0-100 pts.**

Source: Hartburg-Sabine Junction 500 kV Selection Report p 113.

7.5 Risk management

In assessing the 'Cost & Design' criteria for a given proposal, MISO will consider whether any binding cost containment measures are being offered in the cost estimates. In fact, as discussed in section 7.6, MISO expects bidders to propose cost containment measures.

7.6 Cost recovery

Revenue requirements

Each bidder's proposal shall contain an estimated 'Annual Transmission Revenue Requirements' (**ATRR**), beginning in the year that costs would first be recovered, through the first 40 years that the Competitive Transmission Facilities will be in service.[190] Supporting detail on annual allocation factors for operations and maintenance, general and common depreciation expenses, taxes other than income taxes, income taxes and return used to estimate ATRR should also be included in the proposal.

[189] Midcontinent Independent System Operator, SELECTION REPORT Hartburg-Sabine Junction 500 kV Competitive Transmission Project (2018).

[190] Midcontinent Independent System Operator, Business Practices Manual - Competitive Transmission Process (2022).

Cost containment

Bidders may also specify in their proposals if they are offering any binding cost containment measures within their cost estimates. Proposals that contain binding cost containment measures must in detail, describe the measures being proposed and draft agreements that clearly describe any exclusions, exceptions, conditions, enforcement mechanisms and interactions with change orders.

Cost allocation

Bidders can recover costs of preparing bid.[191]

Costs associated with MVPs have a 100% regional allocation basis and is a separate charge to existing network tariffs. A unit-based monthly energy usage charge known as the 'MVP usage rate' is calculated to apportion these costs. It represents the total annual revenue requirement based on the costs of MVPs, divided by the total net system withdrawals. This produces a system-wide rate that is then applied to market participants in the MISO system based on their individual energy withdrawals.

7.7 Model development / evolution

Reduction in voltage thresholds for competition

In a July 2020 order noted above, FERC accepted revisions that, among other things, lowered the voltage threshold for MEPs from 345 kV and above to 230 kV and above.[192]

Proposal process

In order to reduce time and money to prepare and evaluate MISO introduced a revised RFP template, as well as page limits for proposals.[193] Stakeholder concerns surrounding 60-day proposal window for projects valued between $5-40m led to an increase of this window to 90 days.

Rightsizing

MISO also introduced proposal window timelines according to project characteristics. They created two shorter developer selection timelines, as well as the ability to scale the size of proposal deposits as and when it is required.[194] This gave them the ability to manage proposals and selection reports for shorter developer selection timelines.

Using rightsizing increases process efficiency and capability to execute multiple developer selection processes simultaneously.

7.8 Outcomes

MISO has selected only two projects eligible for competitive solicitation since Order No. 1000. In both cases they are market efficiency projects.[195]

Duff-Coleman

In January 2016, the MISO issued its first RFP for a 345 KV transmission line between the Duff and Coleman substations. The cost estimate developed by MISO for the project in the MISO Transmission Expansion Plan for 2015 was $58.9 million and the range submitted in the 11 proposals

191 Midcontinent Independent System Operator, Business Practices Manual - Competitive Transmission Process (2022).

192 Concentric Energy Advisors, How transmission planning and cost allocation processes are inhibiting wind and solar development in SPP, MISO & PJM (2021)

193 Midcontinent Independent System Operator, Competitive Transmission Process Continuous Improvement, Workshop II (July 2019).

194 Midcontinent Independent System Operator, Competitive Transmission Process Continuous Improvement, Workshop II (July 2019).

195 P.L. Joskow, Competition for Electric Transmission Projects in the US: FERC Order 1000 (MIT Centre for Energy and Environmental Policy Research: 2019).

was $34.0 million to $55.7 million. Eleven proposals were received, of which several were from non-incumbents. The MISO issued a selection report in December 2016. The MISO found all of the proposers to be highly qualified but noted significant differences in the attributes of the proposals, including wide differences in estimated costs. However, one proposal was a clear winner based on total points received. The MISO noted in particular that many of the proposals innovative cost containment provisions and cost caps, including the sponsor awarded the project. The winner (Republic Transmission) received the highest score for cost and design as well as the highest score overall. To execute the Duff to Coleman Project, Republic Transmission collaborated with its parents, LS Power and Hoosier Energy (a local transmission owner), as well as Big Rivers Electric Corporation, another local utility.[196,197] Ultimately, the total rate base had a cap at $58.1 million, with exclusions for ongoing O&M costs, material changes to the scope of work and for force majeure events. [198]

Hartburg-Sabine

The MISO issued an RFP for a second competitively bid proposal in July 2018 for a 500 kV line known as the Hartburg-Sabine project. The project had an estimated cost of $129 million. As noted, this too is a market efficiency project. The RFP received 12 responsive proposals, including proposals from non-incumbents. The bids ranged from $95.4 million to $133.9 million, The evaluation criteria used for this second competitive MISO project are the same as for the first project. The evaluation criteria are clearly laid out, points are assigned to each project for the evaluation of its performance in each of the four evaluation 'buckets'. It is clear from the evaluation report that the MISO expects cost caps and other cost containment commitments to be included in proposals.[199] The project was awarded to a nonincumbent with the highest total score (by far) as well as the highest score on cost/design and project implementation. The winning proposal capped several elements of the standard regulate annual revenue requirements as determined by FERC over the life of the project, subject to various contingencies.

In calculating benefit-to-cost ratios for the proposals, MISO saw a range from a low of 1.37 to a high of 2.34, with bidders' ability to deliver lower up-front costs, lower costs over time, or both, driving higher ratios. This contrasts with the MISO's transmission expansion plan benefit-to-cost ratio estimate for the project of 1.35.

196 Midcontinent Independent System Operator, SELECTION REPORT Duff-Coleman EHV 345 kV Competitive Transmission Project (2016).

197 Republic Transmission, Learn More About Republic Transmission | Utility Company.

198 The Brattle Group, Response to Concentric Energy Advisors' Report on Competitive Transmission (2019).

199 Midcontinent Independent System Operator, SELECTION REPORT Hartburg-Sabine Junction 500 kV Competitive Transmission Project (2018).

8. NYISO

Design feature	Description
Scope of competitive tendering	The competitive process operates firstly through a 60-day period for the identification and determination of transmission needs – in which stakeholders and interested parties can submit to NYISO any public policy transmission needs that they have identified. These submissions are presented to the New York Public Service commission (**NYPSC**) who will review the submissions and select which transmission needs (if any) will be opened to the competitive solicitation of solutions. NYISO will then open the transmission need to invite developers to submit their proposed solutions (from design to construction and operation).[200] This is therefore a form of 'very-early' competition. What is interesting to note is that unlike other regions or jurisdictions, the identification of needs involves parties outside of just the system operator.[201]
Threshold for trigger contestability	While there is no value or size threshold that triggers contestability, competition only applies to Public Policy Transmission Needs (other needs include Reliability Needs and Congestion/Economic Needs).
Procuring party	The procuring party for the competitive process is the NYISO, who determines which developers will qualify to propose a solution, and who evaluates the proposed solutions based on a set of criteria. However, the NYPSC (the relevant regulator) plays an active role in the process.[202]
Tender assessment criteria / process	The Tender process follows two phases: Phase I is the identification of and determination of needs, and Phase II is Transmission Evaluation and Selection. The evaluation of proposed solutions contains three components:[203] • **Evaluation of viability:** Whether the proposed solutions is technically practicable and whether it can be completed in the required time frame. • **Evaluation of sufficiency:** Involves a comparable analysis of each proposal to confirm whether they satisfy the Public Policy Transmission Need. • **Final evaluation – efficiency and cost-effectiveness:** NYISO ranks those proposals that are both viable and sufficient, based on a set of efficiency/cost metrics.
Risk management	Risk of cost overrun, and time delays are identified and addressed in the evaluation and selection process. Developers can voluntarily include cost caps in their proposals. Risk of changes in production costs and deliverability risk are also metrics that are considered in the evaluation of efficient/cost-effective projects.
Cost recovery	Developers will include in their proposals cost estimates – which include cost assumptions for items such as material and labour cost, equipment etc., as well as an estimated quantification of cost variance. They may also provide cost caps, which can be 'hard' or 'soft'. Costs incurred for proposals are recoverable under only one circumstance - when the NYPSC specifically requests a TO or other developer to propose a solution.[204]

200 PJM interconnection, Updates on NYISO comprehensive system planning process (2019).
201 New York ISO, Public Policy Transmission Planning Process Manual (June 2020).
202 PJM interconnection, Updates on NYISO comprehensive system planning process (2019).
203 New York ISO, Public Policy Transmission Planning Process Manual (June 2020).
204 New York ISO, Public Policy Transmission Planning Process Manual (June 2020) p 37.

Design feature	Description
Model development / evolution	While NYSIO makes continuous and ongoing improvements to the Public Policy Transmission Planning process, a notable change to process was the establishment of cost containment in the proposal, evaluation and selection of proposals, as well as changes in the cost recovery process.[205] This change involved allowing developers to voluntarily provide a capped amount for defined categories of capital costs, for inclusion in the developer's revenue requirement filing to obtain cost recovery.
Outcomes	NYISO has issued RFPs for three Public Policy Transmission Needs (PPTN) since Order No. 1000 became effective, including the Western New York PPTN, the AC Transmission PPTN and the Long Island Offshore Wind Export Schedule. For the Western New York PPTN, 12 project proposals were submitted by 7 bidders, with 10 of the 12 projects meeting the need from a technical perspective. The winning proposal had a cost of $181 million and was sponsored by a non-incumbent.[206] For the AC Transmission PPTN, 13 projects from 4 bidders were submitted.[207] For the Long Island PPTN, 15 proposals were received, and the process is ongoing.[208]

8.1 Scope of competitive tendering

The competitive bidding process applies to 'Public Policy' and 'Reliability' transmission projects, in which a need is identified, and developers seek to identify innovative solutions to this need. For reliability projects, NYISO conducts a transmission reliability assessment to determine reliability needs.[209] They will then solicit solutions for these identified needs. This is therefore 'early' competition.

However, it is important to note that as part of the Public Policy Transmission Process, any stakeholder or interested party can submit to the NYISO their own identification of a need. This is therefore a form of 'very-early' competition.[210]

Identification and determination of transmission needs

At the start of the Public Policy Transmission Planning Process, NYISO provides a 60-day period in which interest stakeholders or parties can submit (or for the ISO on its own accord) to identify any proposed transmission needs that it believes are being driven by Public Policy Requirements, and for which Transmission Solutions should be requested and evaluated.

Each submission will identify the Public Policy Requirement(s) that the party believes is driving the need for transmission, propose a criteria to evaluate transmission solutions addressed to that need and describe how the construction of this transmission will fulfill the public policy requirements.

NYISO will then submit all stakeholder proposals (and any additional transmission needs, and criteria identified by themselves) to the New York Public Service Commission (**NYPSC**), The NYPSC reviews all proposed transmission need(s) and with input from NYISO, identify the transmission needs (if any) for which specific transmission solutions should be requested and evaluated. After this, the NYPSC issues a written statement that ascertains the relevant Public Policy Requirements driving transmission needs for which transmission solutions will be requited by NYISO. These solutions will include the developer's proposed design, construction and operation of the transmission asset.

[205] New York ISO, Cost Containment Mechanism for Public Policy Transmission Planning Process (2019).
[206] P.L. Joskow, Competition for Electric Transmission Projects in the US: FERC Order 1000 (MIT Centre for Energy and Environmental Policy Research: 2019).
[207] New York ISO, AC Transmission Report Public Draft (March 2018).
[208] New York ISO, Offshore Wind and the Role of New Transmission (2021).
[209] New York ISO, Reliability Planning Process (April 2021).
[210] New York ISO, Public Policy Transmission Planning Process Manual (June 2020).

8.2 Procuring party

After Public Policy needs have been identified and published by NYPSC, NYISO requests that Developers propose specific solutions to address each need. NYISO has the role of determining on the qualification of a Developer to propose to develop a Public Policy Transmission project. NYSIO has the role of evaluating developer proposals, based on a number of qualitative and quantitative metrics.

As part of being the evaluator of proposals, the ISO executes a 'study agreement' with all developers, in which developers must submit to the ISO:[211]

- A non-refundable application fee of $10,000
- A study deposit of $100,000, which is applied to study costs and subject to refund.

The ISO charges every Developer proposing a regulated Policy Transmission Project the actual costs of the ISO's evaluation of the Developer's proposal, through tracking its staff and administrative costs incurred. The ISO may draw upon the study deposit to recover owed amounts, if developers do not pay their monthly invoices within 30 days of the ISO's issuance of the invoice.

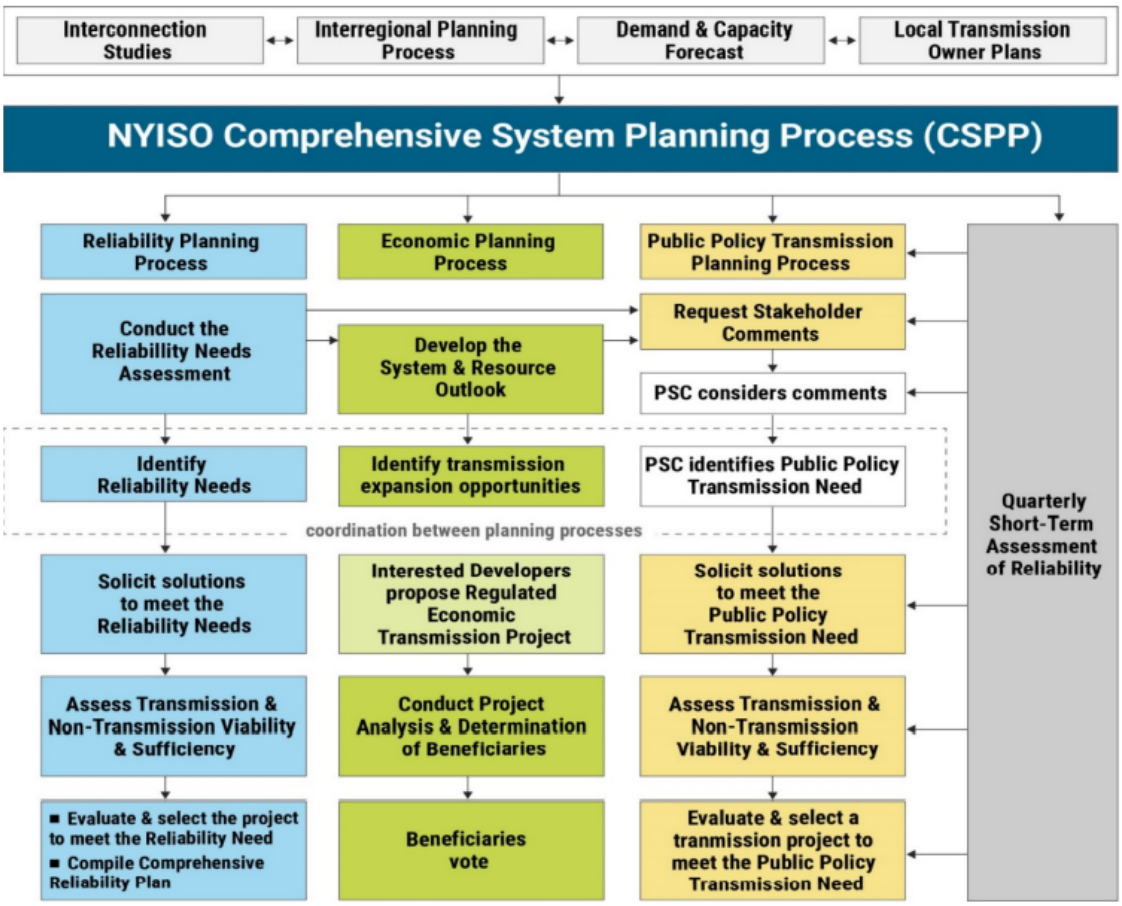
8.3 Threshold for triggering contestability

Contestability only applies to Public Policy Transmission needs, of which NYPSC and evaluate from the identified set of needs, those that they will solicit solutions (introduce competition).[212] There is no threshold that triggers contestability, it is a decision made by these two bodies.

[211] New York ISO, Public Policy Transmission Planning Process Manual (June 2020) p 20.
[212] New York ISO, Public Policy Transmission Planning Process Manual (June 2020).

8.4 Tender assessment criteria / process

Figure 13: NYISO Comprehensive System Planning Process



Source: NYISO, Updates on NYISO comprehensive system planning process (2019).

NYISO manages the state of New York's grid in tandem with the electric utility regulator in New York (New York Public Service Commission – NYPSC). Only public policy transmission planning process goes through very early tendering process. The process is as follow:

1 Stakeholders and NYISO recommends transmission projects

1. NYPSC approves or disapprove the need for the transmission, the RFP used by the NYISO and the evaluation criteria
2. NYISO runs the RFP
3. The selection is made by the NYISO but the NYPSC is informally involved in the ultimate selection

The process is summarised below:[213]

Phase I: Identify needs and assess solutions

- NYISO solicits transmission needs driven by Public Policy Requirements
- NYPSC identifies transmission needs and defines additional evaluation criteria
- NYISO holds Technical Conference and solicits solutions (transmission, generation, or EE/DR)
- NYISO performs Viability and Sufficiency Assessment (VSA).

[213] NYISO, Updates on NYISO comprehensive system planning process (2019).

Phase II: Transmission evaluation and selection

- NYISO staff evaluates viable and sufficient transmission solutions and recommends the more efficient or cost-effective solution
- Stakeholder review and advisory votes at BIC and MC
- NYISO Board may select a transmission solution for purposes of cost allocation and recovery under the NYISO Tariff.

Developers must provide as part of their proposal: contact information; the lead time necessary to complete the project including (if available) the construction windows in which the developer can perform construction; a description of the project including size, type, geographic and electrical location; evidence of a commercially viable technology; a detailed major milestone schedule; a schedule for obtaining permits and other certifications; a transmission and substation routing study; status of any contracts that are under negotiation or in place; a Transmission Interconnection Application; evidence of financing ability; and any cost caps the Developer voluntarily submits.

Developer qualification criteria

The ISO decides on the qualification of a Developer to propose to develop a Public Policy Transmission Project based on the following criteria:[214]

- technical and engineering qualifications and experience of the Developer relevant to the development, construction, operation, and maintenance of a transmission facility
- current and expected capabilities of the Developer to develop and construct a transmission facility and to operate and maintain it for the life of the facility
- developer's current and expected capability to finance, or its experience in arranging financing for, transmission facilities
- a detailed plan describing how the Developer – in the absence of previous experience financing, developing, constructing, operating, or maintaining transmission facilities – will finance, develop, construct, operate, and maintain a transmission facility, including the financial, technical, and engineering qualifications and experience and capabilities of any third parties with which it will contract for these purposes.

[214] New York ISO, Open Access Transmission Tariffs, section 31.4.4.1, 31.4.4.3.6, and 41.4.4.3.7 of Attachment Y.

Evaluation of proposed solutions

NYISO first selects the solutions that meet all the technical requirements to address the identified need.[215]

Area of evaluation	Description
Evaluation of Viability	NYISO will consider: • The Developer qualification data and project information data • Whether the proposed solution is technically practicable • The developer's possession or approach to acquiring the necessary rights-of-way, property and facilities that will make the proposal feasible in the required time frame • Whether the proposed solution can be completed in the required timeframe
Evaluation of Sufficiency	• NYISO performs a comparable analysis of each proposed project to confirm that it satisfies the Public Policy Transmission Need. • If the ISO determines the proposed solution is not sufficient and does not meet the Public Policy Transmission need, it rejects the proposed solution from additional consideration during that planning cycle.

Evaluation of efficiency or cost effectiveness

They then choose the most efficient or more cost-effective solution according to a range of metrics, including capital cost estimates, a qualitative evaluation of the cost cap voluntarily submitted, cost per MW ratio, operability, expandability, performance, property rights, or ability to obtain the property rights, potential issues associated with delay in constructing.

NYISO will rank the projects based on the above metrics, to determine and select the most efficient or cost-effective solution.[216]

8.5 Risk management

Risk of cost overrun, and time delays are again addressed in the evaluation and selection process, as well as by cost caps described in the section 8.6. Cost caps are agreed upon by developers in their proposals, and are branded either as 'hard' or 'soft' cost caps – in which (with hard cost caps) developers cannot recover from ratepayers any cost that exceed their proposed cost cap. Other risk of changes in production costs, emissions, congestion, and deliverability are also considered as metrics in evaluating efficient or cost-effective projects.

NYISO will assess the potential risks in the proposed project of delay in construction, in accordance with their provided 'major milestone schedule' and schedule for obtaining permits/other certifications. This forms a component of the selection criteria.

[215] New York ISO, Public Policy Transmission Planning Process Manual (June 2020).

[216] New York ISO, Open Access Transmission Tariffs, section 31.4.8.1 and 31.4.8.2 of attachment Y.

8.6 Cost recovery

Cost estimates

In their proposal developers must submit their capital cost estimates for the project, which should provide the ISO with 'credible cost estimates' for their proposed project.[217] This includes itemised work sheets outlining material and labour cost, equipment, engineering and design work, permitting, site acquisition, procurement and construction work cost assumptions. This should also include estimated quantification of cost variance and all components needed to meet the Public Policy Transmission Need.

Cost caps

Developers can voluntarily submit Cost Caps along with its project information, that may come in the form of a 'hard cost cap' or a 'soft cost cap' (both explained below).[218] If the developer submitted a cost cap and is selected by NYISO, this proposed cost cap is included in its development agreement for the designated Public Policy Project. The developer cannot seek to recover through its transmission rates costs for capital costs that are above its proposed and agreed-upon cost cap.

A hard cost cap for capital costs is a dollar amount for the costs the developer commits not to recover from ratepayers. A soft cost cap for capital costs is a dollar amount for costs which are shared between the Developer and ratepayers as determined by a defined percentage - the developer's percentage of cost sharing under a soft cost cap must be at least 20%.

Costs incurred for proposals

To ensure that there is a response to a Public Policy Transmission need, the NYPSC may request that a TO or other developer propose a Public Policy Transmission Project. Costs that are incurred by a TO or Other Developer in preparing a proposed transmission solution in response to a request by the NYPSC are recoverable.

8.7 Model development / evolution

In October 2019, NYISO proposed an amendment to the Public Policy Transmission Planning Process in the Open Access Transmission Tariff,[219] to 'establish the treatment of cost containment in the project proposal, evaluation and selection, Development Agreement and cost recovery processes'. This would allow for developers in their proposed solutions to voluntarily provide a capped amount for defined categories of capital costs, of which the cost cap will be included in its revenue requirement filing with the Commission to obtain cost recovery. This proposed change to allowing cost caps was implemented and is outlined in section 8.6. In NYISO's proposal document, they outline which costs can be included in cost caps (capital costs only), and how exactly these cost caps should be implemented and evaluated. NYISO evaluates cost caps at both a quantitative (use the proposed cost caps as estimates for total capital cost) and qualitative level (as a metric amongst other metrics to select efficient projects).

The NYISO had also solicited feedbacks from stakeholders in 2019 to improve processes in soliciting competition.[220] This feedback included focusing on processes to; involve the Board early on; gather feedback on the metrics NYISO will use through the evaluation and selection process; hold an in-depth technical conference prior to soliciting solutions to explain the study methodologies and outline how each metric will be evaluated; collaborate with incumbent facility owners to obtain system constraints that are identified in the baseline assessment before soliciting proposals; and develop an open and transparent process to continuously update stakeholders.

[217] New York ISO, NYISO Open Access Transmission Tariffs (May 2022).
[218] New York ISO, NYISO Open Access Transmission Tariffs (May 2022).
[219] New York ISO, Cost Containment Mechanism for Public Policy Transmission Planning Process (2019).
[220] New York ISO, Lessons Learned Kick-off: AC Transmission Public Policy Transmission Planning Process (2019).

8.8 Outcomes

The NYISO has only issued RFPs for three public policy transmission needs (PPTN) since Order No. 1000 became effective. These include the Western New York PPTN, the AC Transmission PPTN and the Long Island Offshore Wind Export Schedule.[221]

Western New York PPTN[222]

- November, 2015: The NYISO solicited proposal for the identified need – overloaded transmission lines in Western New York needed additional transfer capacity.
- December, 2015: The NYISO received 12 project proposal submitted by 7 bidders. Project's construction costs varied from $157 million to $487 million.
- May, 2016: The NYISO concluded that 10 out of the 12 projects were meeting the need from a technical perspective. They sent the report to the NYPSC to ascertain whether they believed this public policy need still existed, and, if so, to give guidance to allow NYISO to progress with the complete evaluation of the proposed projects.
- October, 2016: The NYPSC affirmed the need for the Western New York Transmission expansion. NYISO now must further evaluate the competing proposal.
- October 2017: The NYISO board approved a winning proposal having an expected construction cost of $181 million, sponsored by a non-incumbent. The project is expected to be completed on June 2022.

The selected solution awarded to NextEra energy is estimated to be 22% below the lowest-cost incumbent solution submitted ($181 million vs $232 million).[223]

Increase transfer capability for AC Transmission[224]

In December 2015, the NYPSC designated a Public Policy Transmission Need to relieve congestion between upstate and south-eastern New York by increasing transfer capability in two network segments. In February 2016, the NYISO issued a request for proposals. Fifteen projects from 5 different sponsors were issued with construction costs varying from $375 million to $659 million for segment A and from $275 million to $380 million for segment B. In April 2019, the NYISO's Board of Directors selected the proposals. Both the Segment A and Segment B projects commenced construction in 2021 and are planned to be powered by December 2023.[225]

Long Island Offshore Wind Export Schedule

In March 2021 the NYISO was ordered by the NYPSC to request proposals for Public Policy transmission needs driven by new offshore wind generation.[226] This was as part of an identified public policy need, to progress the state's plan to achieve increased renewable energy production. The NYISO received 15 proposals and the process is still ongoing.

221 Potomac Economics, 2020 state of the market report for the New York ISO markets (May 2021).

222 P.L. Joskow, Competition for Electric Transmission Projects in the US: FERC Order 1000 (MIT Centre for Energy and Environmental Policy Research: 2019).

223 The Brattle Group, Cost Savings Offered by Competition in Electric Transmission: Experience to Date and the Potential for Additional Customer Value (2019).

224 P.L. Joskow, Competition for Electric Transmission Projects in the US: FERC Order 1000 (MIT Centre for Energy and Environmental Policy Research: 2019).

225 New York ISO, New York's Clean energy Grid of the Future (2021).

226 New York ISO, Offshore Wind and the Role of New Transmission (2021).

Contact us

Eamonn Corrigan
Principal Director
+61 2 9335 8555
ecorrigan1@kpmg.com.au

Georgia Pick
Manager
+61 2 9346 5737
gpick@kpmg.com.au

KPMG.com.au