

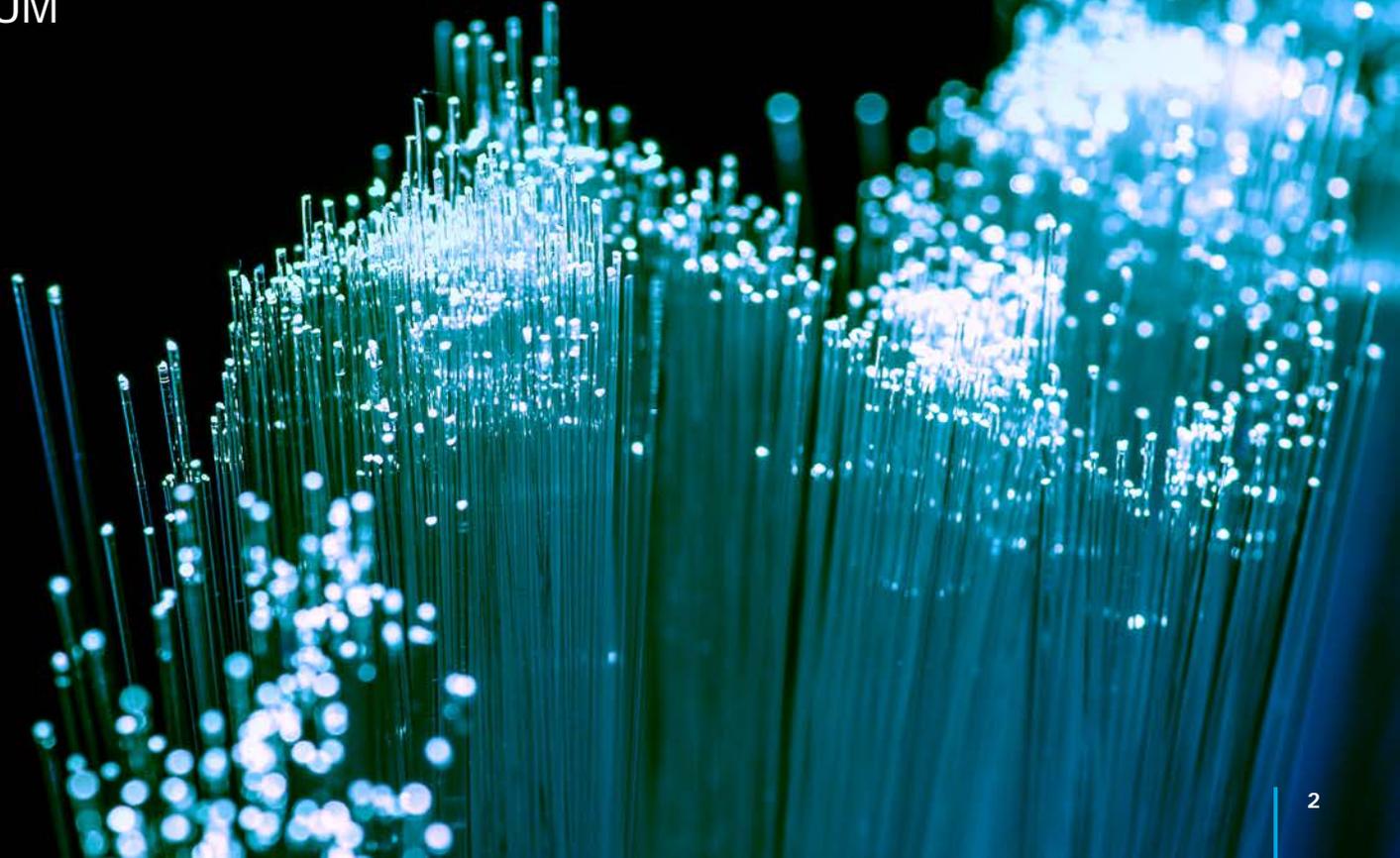
COGATI REVIEW

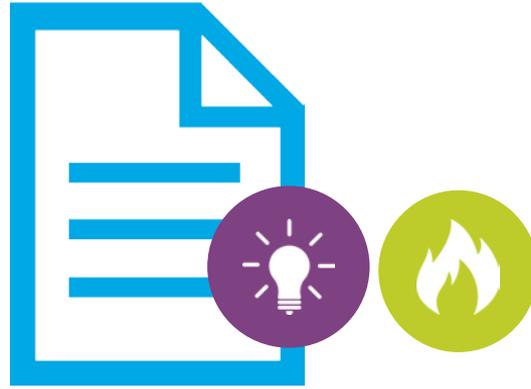
AUSTRALIAN ENERGY MARKET COMMISSION
8 JULY 2019

AEMC

WELCOME

COGATI PUBLIC FORUM





We are the rule maker
for Australian electricity and
gas markets

What we do

We make and amend the:



National Electricity
Rules



National Gas
Rules



National Energy
Retail Rules



We also
provide market
development
advice to
governments

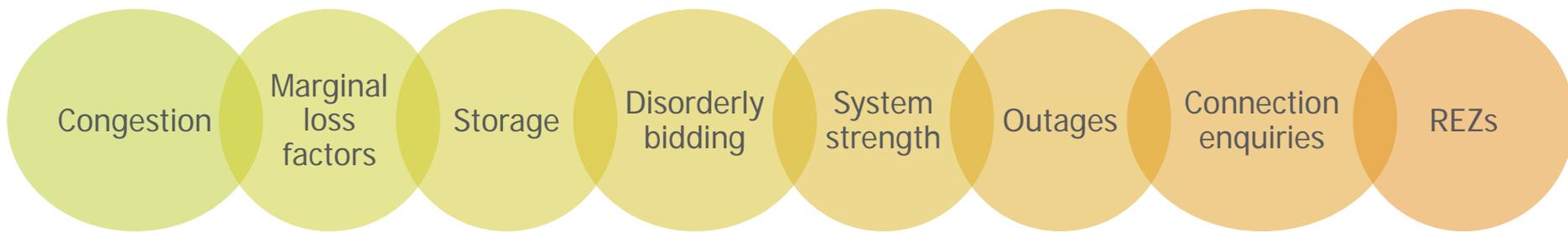
NEED FOR REFORM

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1. Generator access and transmission pricing



Need for access reform

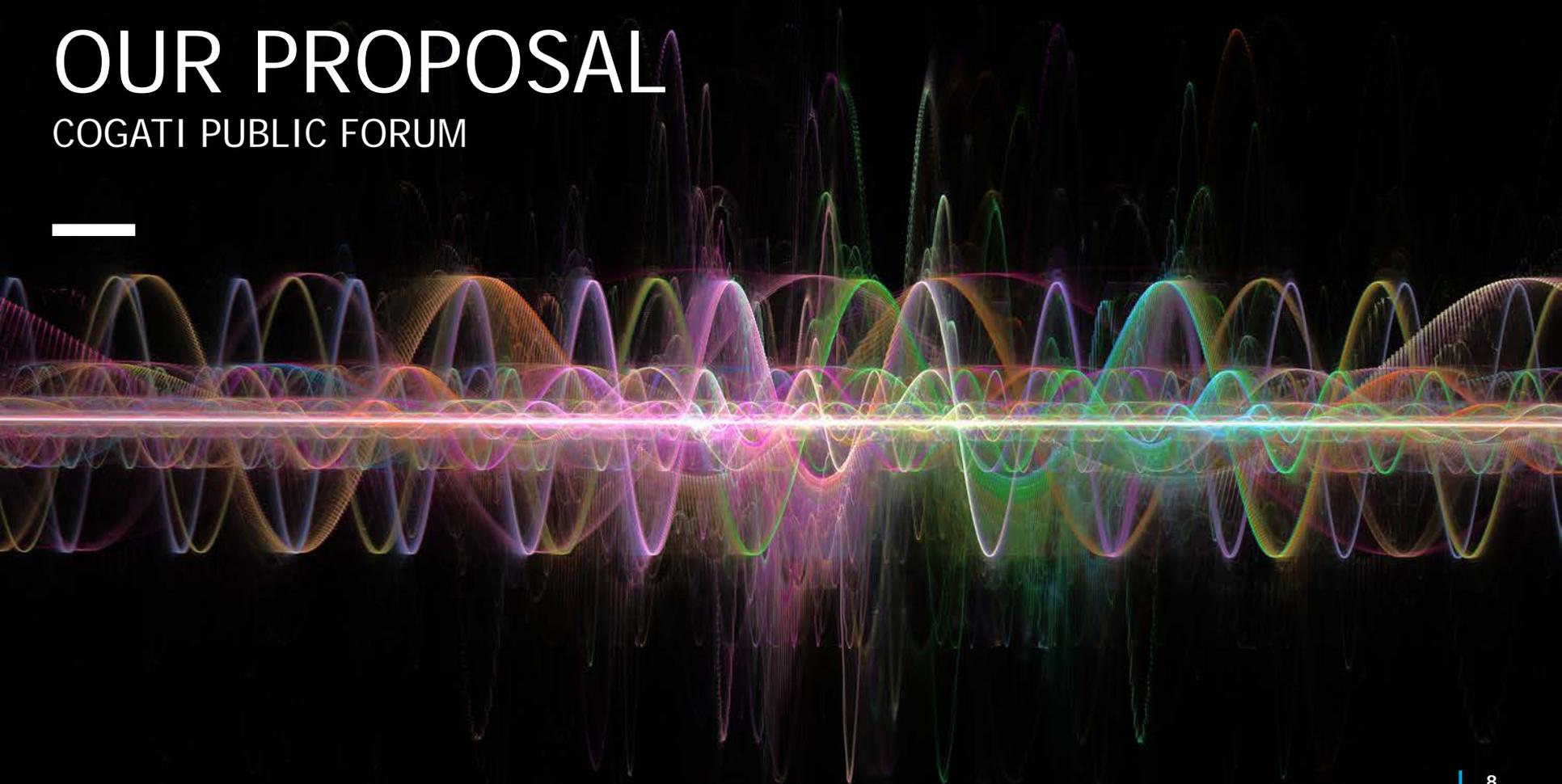


Generators, consumers and transmission businesses are facing worsening and related issues as the electricity market transitions.

We consider that these issues can be resolved through a holistic reform to access arrangements

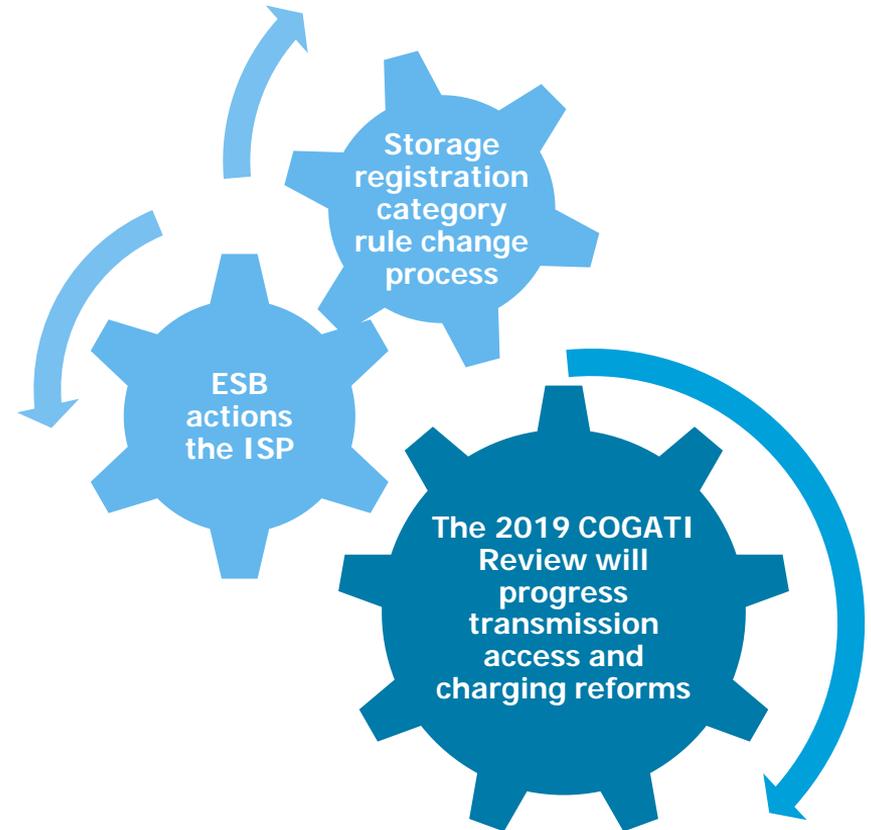
OUR PROPOSAL

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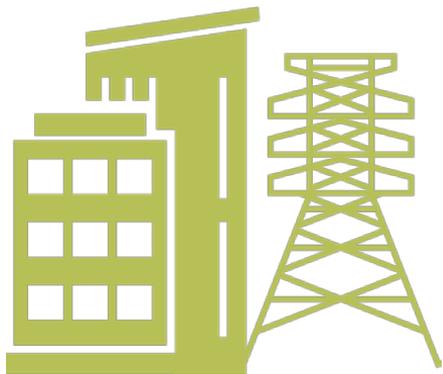


Background to the COGATI review

- We have a standing terms of reference from the COAG Energy Council to undertake biennial reporting on **when** the transmission planning and investment decision-making frameworks will need to change, and **what** they need to change to.
- The final report for the inaugural COGATI Review was published in December 2018.

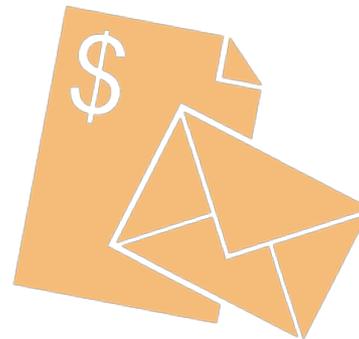


What the review is tasked with



Access reform

Addressing the need for **greater certainty** for generators that they can get their energy to consumers, and **reducing the burden** on consumers in funding transmission investment.



Charging reform

Examining how to **better align the costs** of transmission, especially interconnectors, **with those parties that benefit** from the investment.

Energy market transition

In order to support the transition of the electricity system, the transmission network will need to develop to efficiently connect and transport large amounts of energy from dispersed renewable generation across the NEM to where consumers want to use it.



Our proposal for access reform

1. Wholesale electricity pricing



Generators receive a price that better **reflects the marginal cost** of supplying electricity at their location in the network

2. Financial risk management



Generators are better able to **manage the risks of congestion** by purchasing a transmission hedge

3. Transmission planning and operation



Transmission planning is **informed** by the purchase of transmission hedges, with the cost of transmission investment no longer solely recovered from consumers

Wholesale electricity pricing

Currently, generators pay the regional reference price regardless of where they locate in a region.

Our reform would have generators receive a **dynamic regional price** that more accurately represents the marginal cost of supplying electricity at their location in the network.

This should:

- improve the **efficiency** of dispatch across the NEM
- provide greater **transparency** of congestion costs
- assist in **defining the value** of transmission hedging products
- contribute to **improved signals** for prospective generators when they are deciding where is the best location to invest.



Prices will more accurately reflect the costs of supplying electricity

Financial risk management

Currently, a generator's ability to earn revenue is a direct function of its physical dispatch.

We are proposing to enable generators to better manage the risks of congestion through purchasing transmission hedges.

These products will allow generators to more **effectively manage** the costs of congestion. This should:

- improve **investment certainty** for prospective generators and
- may **reduce the cost of capital** for generation investment in the longer term.



Generators will be able to better manage the risks of congestion

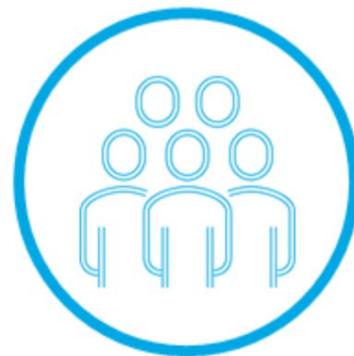
Transmission planning and operation

Under current arrangements, transmission and generation investment occur under different processes.

Under the proposed reform, transmission planning **will be informed** by generator's purchase of transmission hedges.

Transmission costs will be no longer solely recovered from consumers: a **portion** would be collected from generators purchasing of transmission hedging products.

Transmission hedging should achieve a higher **degree of co-optimisation** of transmission and generation investment.



Consumers will face less costs and risks when new transmission is built

Renewable energy zones

Renewable energy zones can **enhance coordination** between generators in order for efficiencies of scale and scope for **connection assets**.

Ways to facilitate REZs should be **simple** and **easy**. We explore two ways in our directions paper. These are:

1. Increasing coordination
2. Allowing risks to be shared.



REZs can be used to transition to access reform

Implementation and transition

Our proposal is for all three elements of access reform to be introduced in **July 2022**.

Transitional processes will be necessary to make sure that access reform:

- does not create **sudden changes** in the market, and
- allows for a **learning period**.

Access reform has **winners** and **losers**. Transitional arrangements, both in terms of the timeframes for introduction and grandfathered rights, will be important to manage this.

Locational pricing and hedging in New Zealand

COGATI access and charging review – public forum

JAMES FLEXMAN

Wholesale Markets Manager

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8 July 2019



MERCURY AT A GLANCE



100% renewable generation

- > Two low-cost complementary fuel sources in base-load geothermal and peaking hydro.
- > Vertically integrated with retail



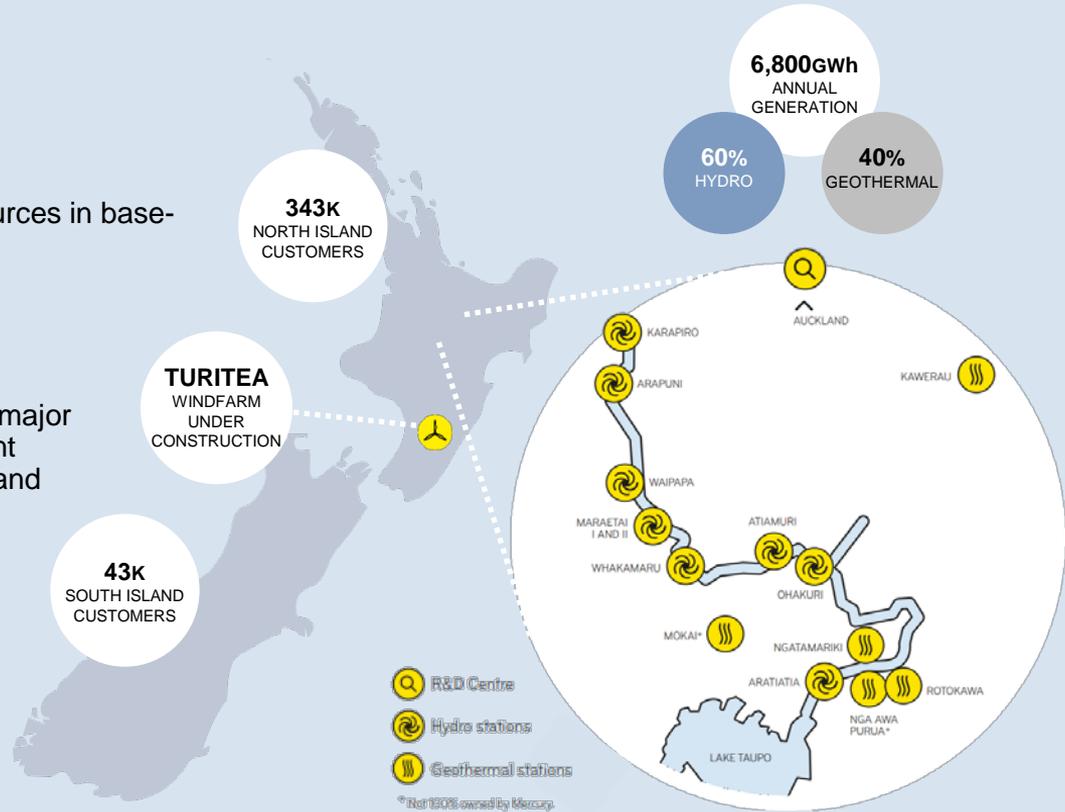
Superior asset location

- > North Island generation located near major load centres; rain-fed hydro catchment inflows aligned with winter peak demand



Substantial peaking capacity

- > The Waikato hydro system is the largest group of peaking stations in the North Island



NEW ZEALAND ELECTRICITY MARKET STRUCTURE SINCE 1998

1 RETAILERS AND CONSUMERS

- > Retail prices determined by competition (unregulated)
- > >40 retailer brands buy from wholesale market and on-sell to nearly 2 million consumers
- > Electricity Authority responsible for promoting competition, efficiency and reliability of supply for long-term benefit of consumers
- > NZAS (aluminium smelter) 13% of national demand
- > 2 major metering companies

WE OPERATE HERE

1

WE OPERATE HERE

4



2 DISTRIBUTION AND NETWORK OWNERS

- > Regulated monopolies
- > 29 distribution companies
- > 150,000km of overhead and underground networks

3 THE NATIONAL GRID

- > Transpower (Government owned) is regulated owner and operator
- > Transports high voltage electricity to networks and large industrial users
- > 1,200MW HVDC link between South and North Islands

4 GENERATORS

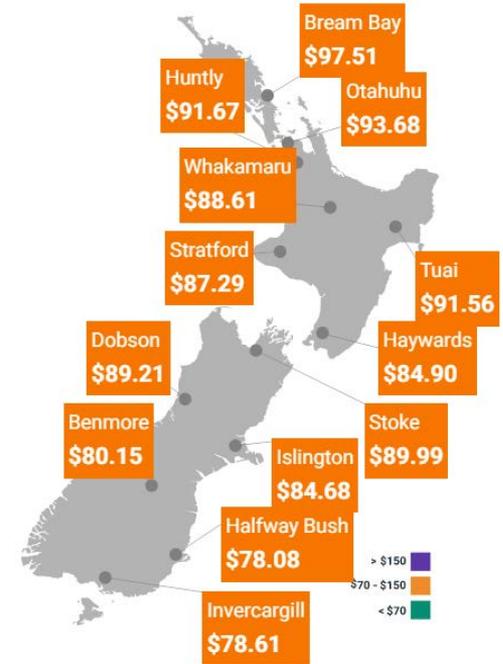
- > Wholesale prices determined by competition
- > Generate electricity and sell to wholesale market
- > 5 major vertically integrated gentailers producing about 95% of NZ's electricity
- > 80% renewable electricity (unsubsidised)



WHOLESALE MARKET DESIGN

- Energy-only, gross pool market similar to Australia introduced in 1998
- Full nodal pricing (~250 nodes) every 30mins
- Generation is paid and load pays the locational marginal price
- Price risk managed via financial hedging:
 - Contracts for Difference (CfDs) – from 1998
 - Electricity Futures (through ASX) – Oct 2010
 - Financial Transmission Rights - since 2013
- Most hedging is around a limited number of key nodes

RTP (5 MIN) PRICES TP 29 (14:05)

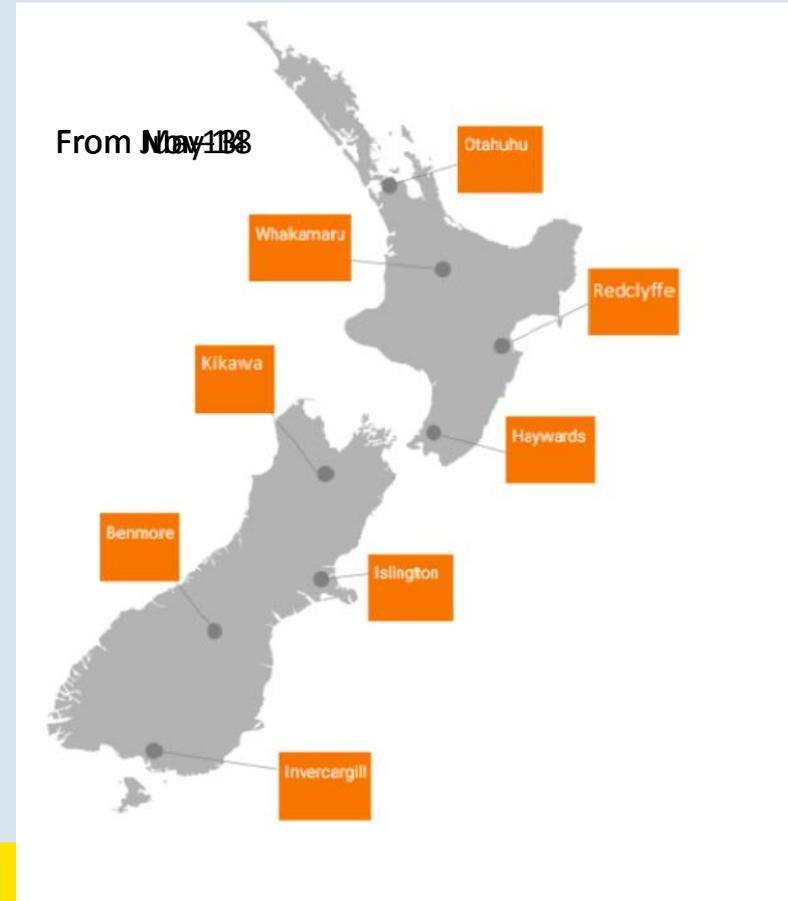


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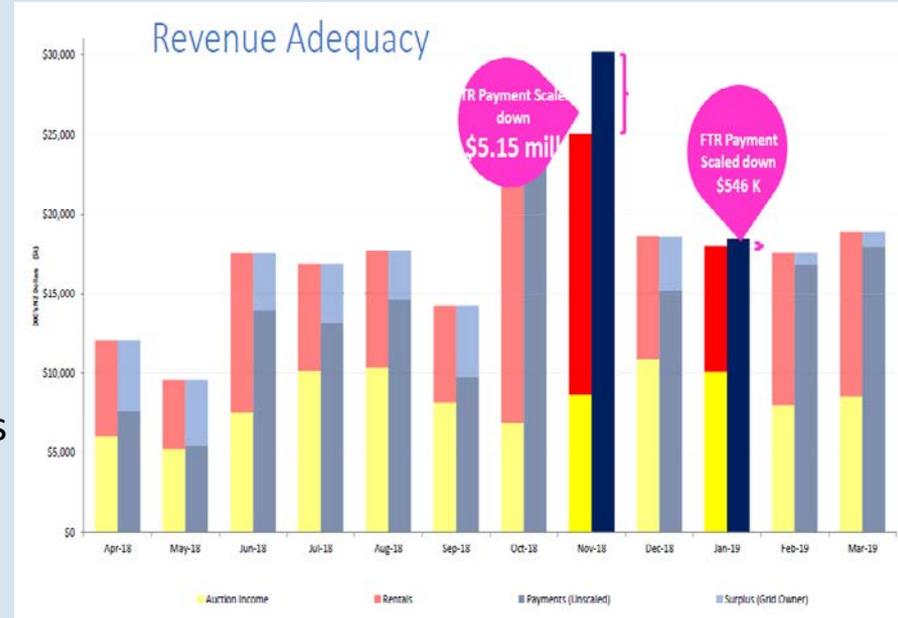
FINANCIAL TRANSMISSION RIGHTS

- Introduced in 2013 at two main nodes in the North and South Island to hedge risk of price separation across the HVDC inter-island link
- Eight main FTR nodes (“Hubs”) now traded
- Capacity is released across 12 (blind) auctions
- 0.1MW min volume
- Monthly auctions with 112 different products
- Options and Obligations



FINANCIAL TRANSMISSION RIGHTS (CONT)

- Settled against monthly prices
 - No peak or weekly settlements
- Scaling of payouts can happen
 - Not a perfect hedge
- Do not financially contribute towards a generator's ROI or transmission grid investments
- Few independent retailers participate... but a number of financial institutions do.



NODAL PRICING + FTR's - OPERATIONAL IMPLICATIONS

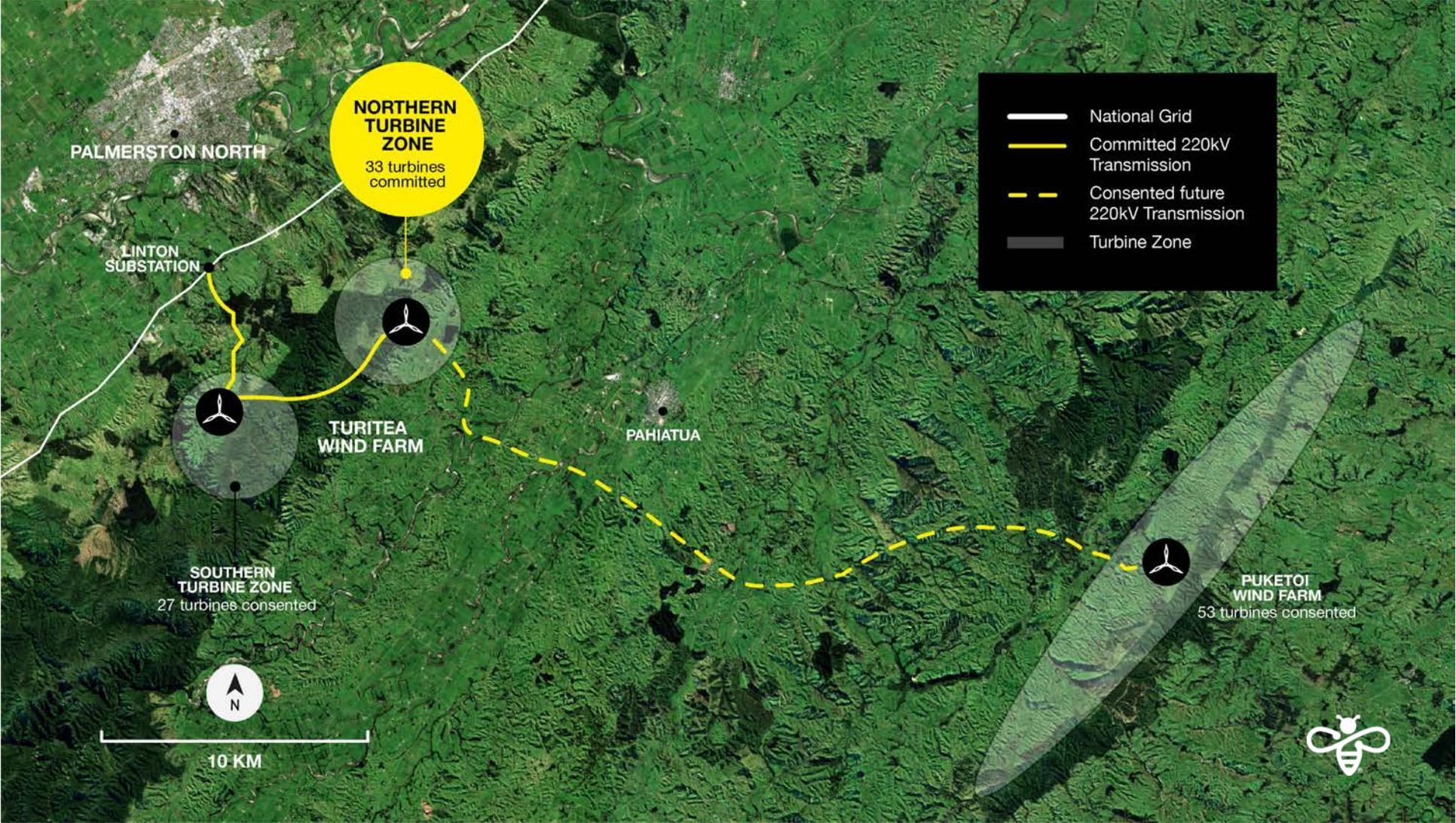
- Financial risk management products critical in nodal pricing market (CfD's / Futures contracts / FTRs)
- Physical generation assets don't fully cover retail market risks related to nodal pricing
 - Example: Mercury owns no physical generation in South Island – buys Southflow FTRs to “shift” North Island generation to South Island
- FTRs reduce locational price risk for retailers holding ‘traditional’ hedge products
- FTRs (combined with Futures) allow retirement of generation plant
 - Example: Mercury retired uneconomic thermal peaking plant in Auckland and now buys Futures to cover energy (volume) risk and FTRs to cover locational price risk
- ASX Futures Liquidity has been supported financial institutions trading FTRs



INVESTMENT DECISIONS

- Nodal pricing provides:
 - important locational signals for generation investment
 - signals to the Grid Owner as to where grid capacity is close to maximum and where grid investment is needed
- FTRs protect "first movers" from future demand growth on transmission assets and provide a means for transmission investors and regulators to compare the cost of transmission constraints with the cost of new investment.
- Examples:
 - Kawerau Transmission investment
 - Turitea wind farm development – Mercury is building our own transmission line as part of the project





PALMERSTON NORTH

NORTHERN TURBINE ZONE
33 turbines committed

LINTON SUBSTATION

TURITEA WIND FARM

PAHIATUA

SOUTHERN TURBINE ZONE
27 turbines consented

PUKETOI WIND FARM
53 turbines consented

- National Grid
- Committed 220kV Transmission
- - - Consented future 220kV Transmission
- Turbine Zone



10 KM



SUMMARY

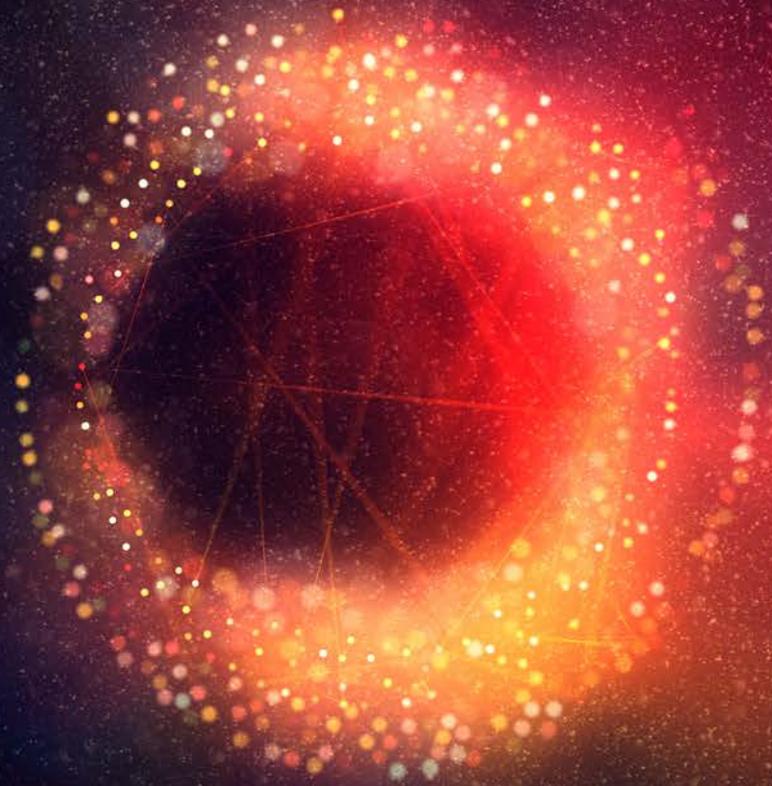
- Where a locational marginal pricing model is chosen, being able to manage locational price risk via transmission hedges is critical.
- The NZ market (full locational marginal pricing supported by FTRs) functions well – not to say there aren't a few issues!
- Important to ensure the complexity of the market does not deter participation
 - In NZ we trade FTRs on just 8 hubs but involvement of the less well resourced participants is low
- Ensure any changes implemented are sustainable and enduring – uncertainty will undermine confidence of participants and the benefits available.





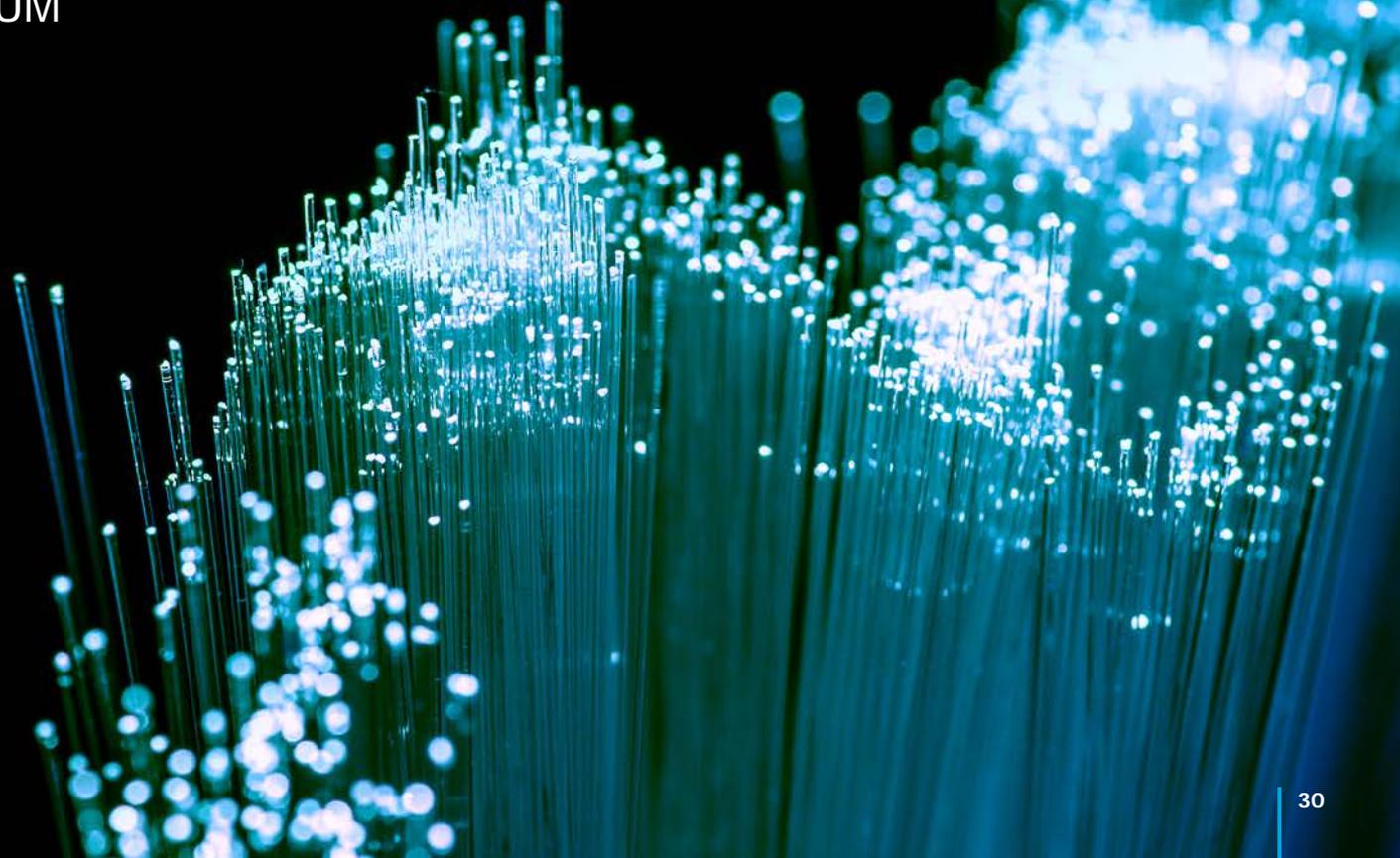
PANEL DISCUSSION

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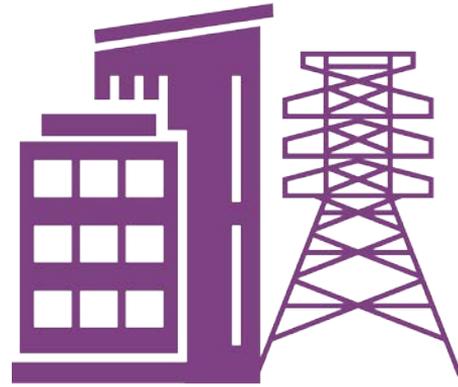
DESIGNING AN ACCESS REGIME

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Designing an access regime

- The Commission is interested in your input regarding on the proposed access regime.
- We will focus today on the design of transmission hedges.
- This feedback will feed into the detailed design work that will be presented in our September draft report.



We want your input on
transmission hedging

Transmission hedging relates to the second two aspects of access reform

1. Wholesale electricity pricing



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Access product features

The products offered must be consistent with what generators **want** or would find **useful**.

FEATURE	DESCRIPTION
AMOUNT	<ul style="list-style-type: none">• Should hedging products only be sold in MW? Or should there also hedges also be available in other metrics to manage the risks raised by system security constraints?• Should the volume of products sold be capped at the generator's capacity or be unlimited in nature?
LOCATION	<ul style="list-style-type: none">• Should transmission hedges be sold according to whether they are inter- or intra-regional products? Or should hedges be region agnostic in design (e.g. relating to any two nodes in the network, rather than a local node and a regional reference node)?
DURATION	<ul style="list-style-type: none">• What is the maximum length of time that transmission hedges should be for?• What is the minimum length of time that transmission hedges should be sold for?
TYPE	<ul style="list-style-type: none">• Should the transmission hedge be for a fixed MW quantity? Or should it be sold as a variable quantity?

Product procurement and pricing

Products could be sold:

- directly from the TNSP at a price that reflects the nature of the product
- through a regular auction process with a reserve price.

A regular auction process may be better suited if there is high demand for access from many generators within a region.



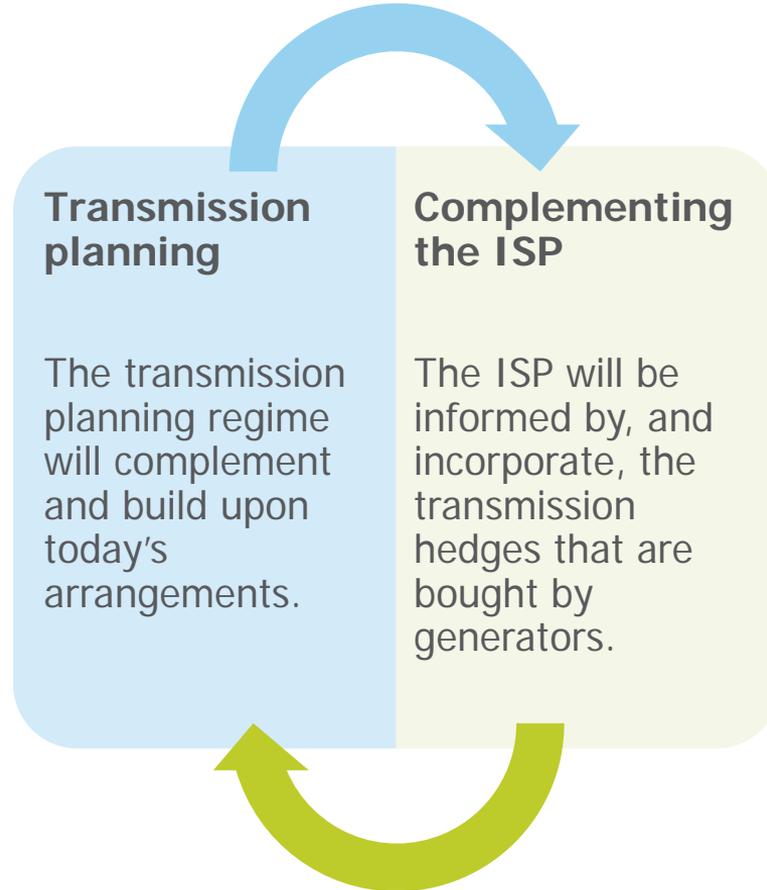
Procurement may differ depending on the type of hedge

An aerial photograph of a coastal city at sunset. The city is illuminated with warm lights, and the sky is a mix of orange, yellow, and blue. The ocean is visible in the background, and the city is built on a hillside. A blue vertical bar is on the left side of the slide, and a blue horizontal bar is below the text.

Transmission incentives & regulation

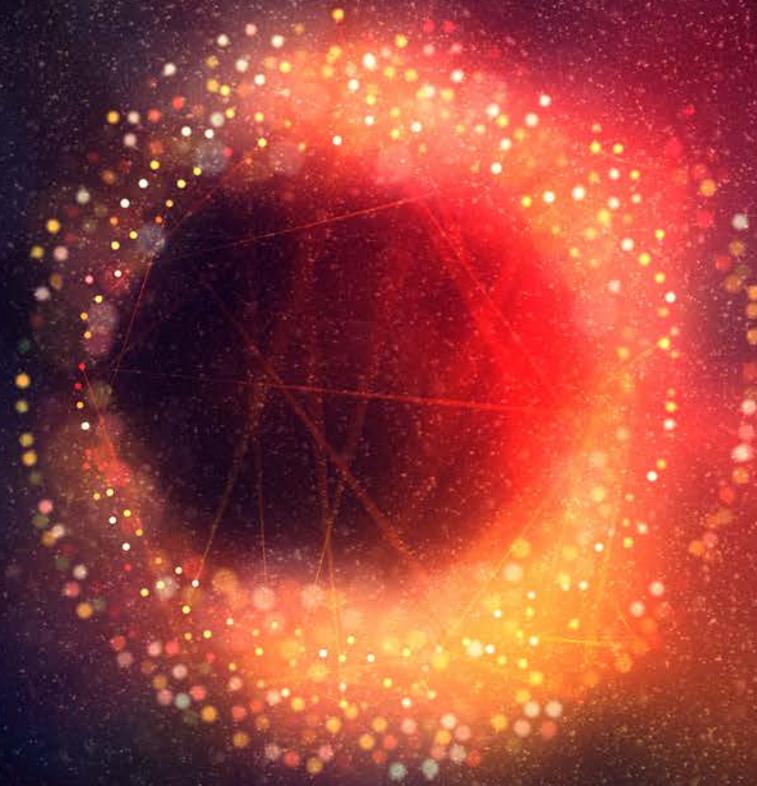
A transmission operating standard will encourage TNSPs to operate their network efficiently to provide adequate transmission for generation under all conditions.

Transmission planning will complement the ISP



PANEL DISCUSSION

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ROUNDTABLE DISCUSSION

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Questions for table discussion

Each table should pick **two topics** to discuss from the list below.

- **Product features:** What access products - defined by duration, location, amount and type - do generators want?
- **Product procurement:** Do stakeholders agree that access products should be purchased via an auction?
- **TNSP incentives and regulation:** Do stakeholders agree that an operating incentive scheme on TNSPs is required?
- **Transmission planning:** Do stakeholders agree that access reform and the Integrated System Plan should be integrated? If so, do stakeholders agree with the Commission's assessment about how this could be achieved?

NEXT STEPS

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Next steps

