REFORM DESIGN: UPDATED TECHNICAL SPECIFICATIONS

TECHNICAL WORKING GROUP

25/09/2020

AEMC

Agenda

1. Welcome and introductions
2. Locational marginal pricing design
3. Financial transmission rights design
4. Implementation and transitional FTR arrangements
5. Complete Design
6. Next steps

Welcome and introductions

Recap:

- The technical working group **assists with the detailed design of the model**
- It includes representatives from **networks, generators, consumer bodies and market bodies** – it has also expanded to **include** interested **ESB 2025 working group members**

- The purpose of the technical working group is to:
  - **Provide advice** and **input** into the progression of the project by attending and participating in working groups
  - **Share expertise** to help consideration and development of issues
  - Provide **differing viewpoints** to challenge thinking

Team in attendance

- Victoria Mollard
- Ben Davis
- Tom Walker
- Daniela Moraes
- Russell Pendlebury
- Jess Scranton
- James Tyrrell
- Orrie Johan
- Tom Meares
- Ella Pybus

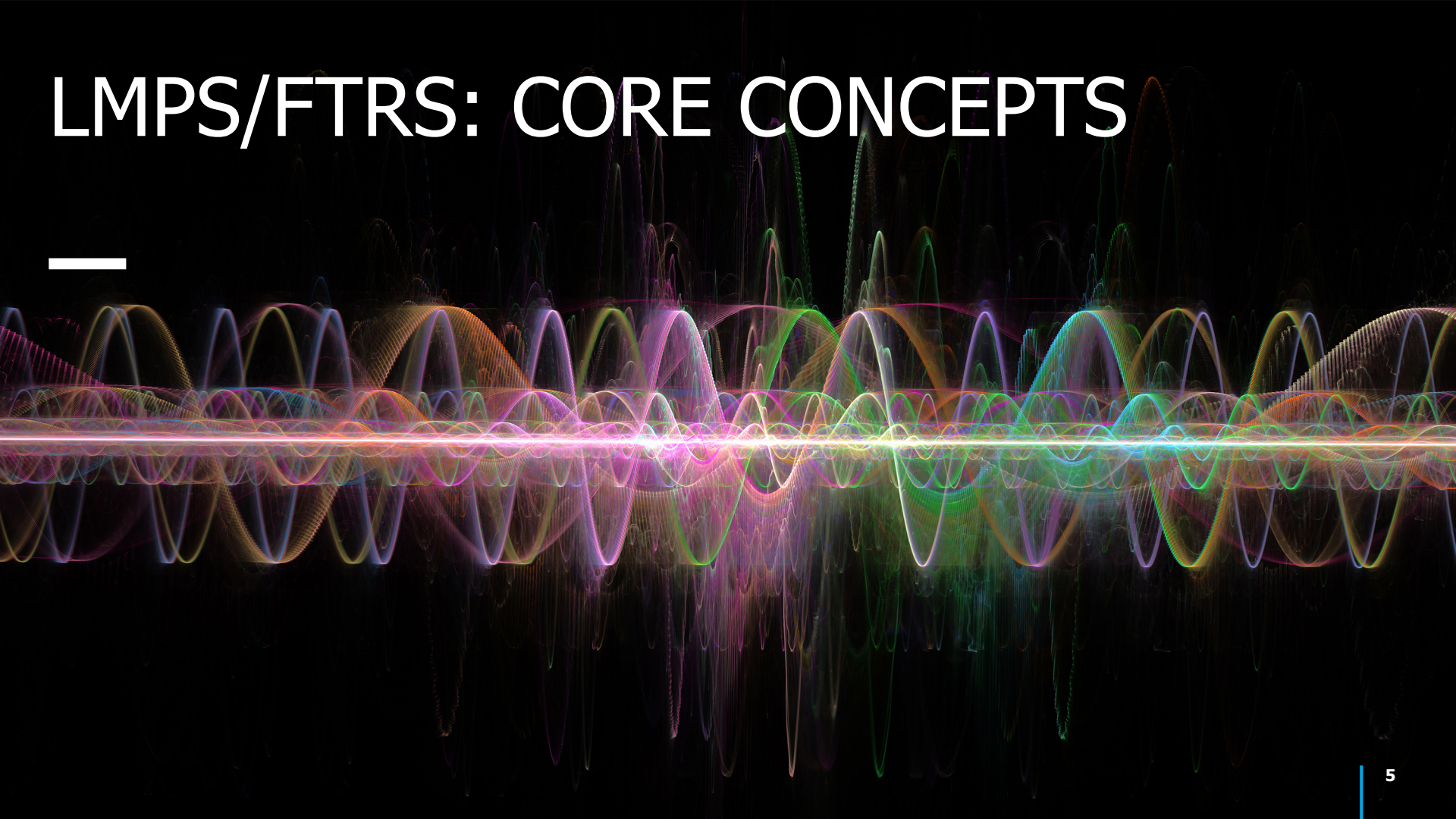
Purpose of this session

- As part of the ESB's 2025 consultation, we published an accompanying Interim Report. We also published quantitative analysis of both the benefits and costs of the reform, in response to stakeholder requests for these.
- Our paper provides an update on the design features of the proposed transmission access reform model, and briefly introduces the results of the analysis performed by NERA Economic Consulting and HARD Software
- The reports are designed to be read in conjunction with our March release which included the design blueprint and NERA's analysis of international comparisons.
- The reports are published for stakeholder consultation and feedback. Stakeholders are invited to provide written submissions by **19 October 2020**.
- Submissions will inform the next iteration of design.
- These processes are designed to facilitate progression of rule changes in 2021.
- The session today is **not to discuss the results of the modelling** conducted by NERA. This was discussed at the public forum held on 17 September.

Review and provide feedback on each specific design element in the proposed design

Review and provide feedback on the proposed design as a complete whole

LMPS/FTRS: CORE CONCEPTS



LMPs and FTRs: a reminder of the core concepts

- **Locational marginal pricing (LMP)** involves settling market participants at a price which reflects the marginal cost of supply at their specific location on the transmission network.
    - This could also be thought of as LMP involving pricing the marginal cost of **constraints** on the transmission network. When constraints bind on the transmission network, LMPs differ from one another, reflective of the marginal cost of constraints.
- LMPs result in **settlement residues** arising because of a difference in the price generators are paid and load pays for the same unit of energy in the presence of binding constraints.
- These settlement residues can be used to back **financial transmission rights** (FTRs) which can be purchased by in an auction facilitated by the system operator.
- The auction revenue from the sale of the FTRs, plus any unused settlement residue, is (primarily) returned to consumers, via TNSPs, as an **offset to TUOS** charges.
- The FTRs pay out on price differences that arise between local marginal prices, and so are useful **congestion risk management tools** for market participants.
- If fixed volume FTRs (of the basic form: *quantity x (LMP1 – LMP2)*) are sold consistent with the physical capacity of the network at the time of dispatch, then it mathematically works out that there will be at least enough settlement residue to back the FTR payouts (ignoring losses). This is known as "**revenue adequacy**", and is observed internationally, as well as through the NERA modelling.

LOCATIONAL MARGINAL PRICING DESIGN

Who faces the locational marginal price

Proposal

- **Scheduled and semi-scheduled market participants (including scheduled loads) would be settled at the LMP**

Rationale

- Parties that are responsive to changes in wholesale prices are currently largely those that are scheduled. Efficiencies can be realised from exposing these parties to their LMP
- This is consistent with US markets, where only the equivalent of scheduled participants face LMPs. In contrast, in New Zealand, all generation and consumption is settled at the LMP

The proposal is unchanged from the March paper

Who faces the regional price

Proposal

- **Non-scheduled market participants (i.e. nearly all load) would continue to face the regional price for the region in which they are located.**

Rationale

- A regional price is retained in order to support contract market liquidity. Load would also have the option of becoming scheduled if it wished to face the local price.

- This is consistent with US markets, where only the equivalent of scheduled participants face LMPs. In New Zealand, all generation and consumption is settled at the LMP.

The proposal is unchanged from the March paper

What is the regional price

Proposal

- **The regional price should be the volume-weighted average price (VWAP).**

Rationale

- The use of VWAP means that the FTRs are more effective in managing basis risk since it makes them firmer than they would be if the RRP was used.
- While this is a change for participants – and potentially results in changes to contracts – we think the benefits it brings are worth the change

- No international market uses the LMP at a single pre-defined node (i.e. the current arrangements for the RRP) to collectively settle non-scheduled market participants. US markets use a VWAP. New Zealand employs full nodal pricing.

The proposal is a change from the March paper – both options were outlined in March, but no recommendation was made

How are losses reflected in the wholesale electricity price

Proposal

- **Locational marginal prices should reflect dynamic marginal losses.**

Rationale

- Replacing static intra-regional marginal loss factors with dynamic marginal losses could result in potentially significant dispatch efficiencies. NERA's estimates confirm this analysis.

- Internationally, LMPs typically dynamically reflect losses.

- If in the fullness of time, related system changes are not required and more detailed cost estimates imply the cost of dynamic marginal losses is greater than the expected benefit, then this design feature could be reconsidered.

The proposal is a change from the March paper – no recommendation was given in March, pending further analysis and consultation

Are inefficiently high prices an issue with LMPs

Proposal

- **Based on stakeholder feedback and internal analysis, the Commission believes that further analysis is needed to quantify the scale of the problem in order to reach a preferred design decision**.

Rationale

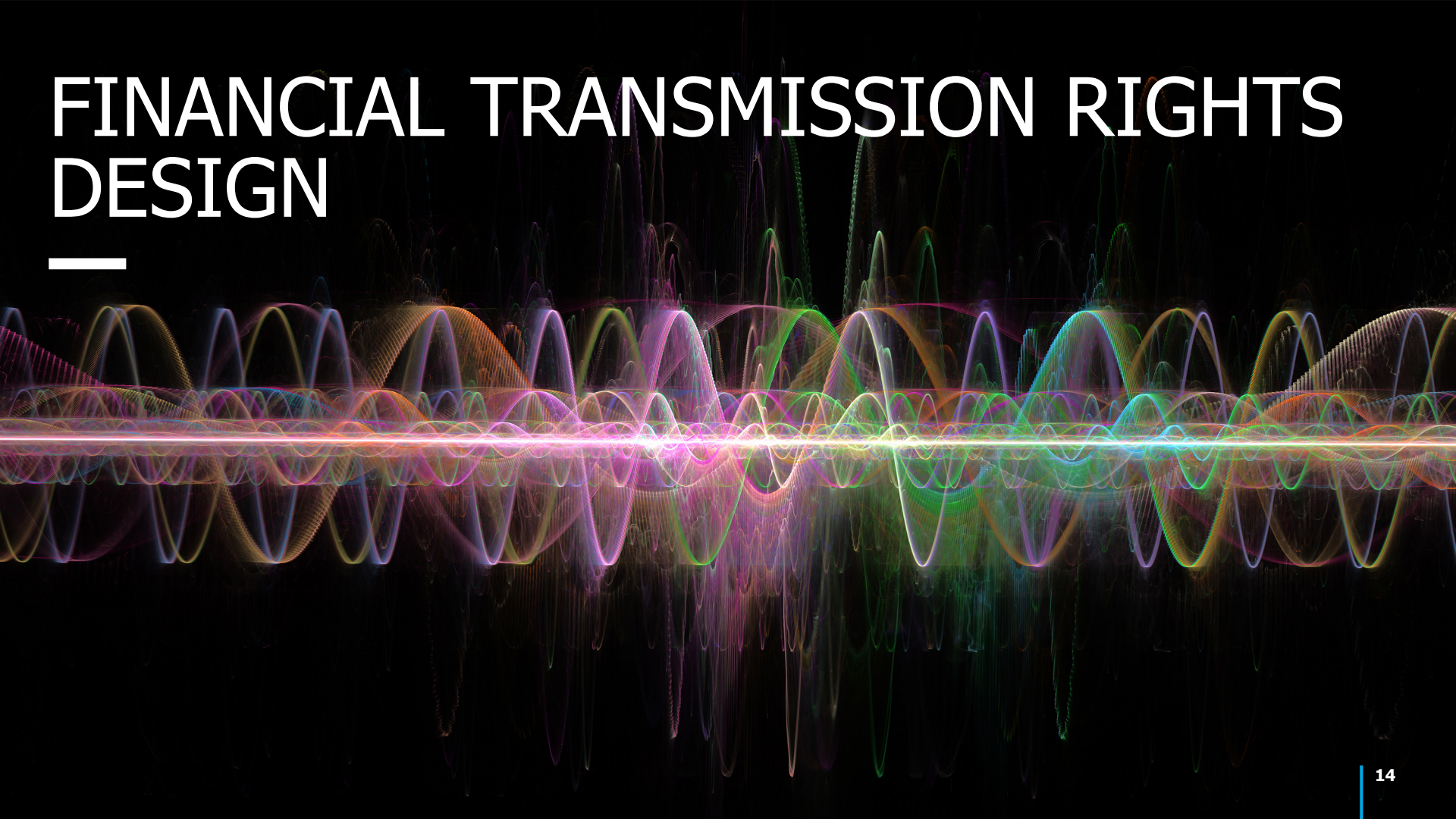
- The need for such a mechanism will be informed by empirical analysis.
- If required, an ex ante mechanism which caps bid prices under specific circumstances is preferred, because it would result in predictable outcomes.
- A decision on the specific design of the ex ante mechanism will be taken through the remainder of 2020, consistent with the detailed design of other aspects of the reforms. We are undertaking quantitative analysis to estimate the materiality of this problem.

The proposal is consistent with the March paper – no recommendation was given in March, pending further analysis and consultation

Questions

- Do you agree with the use of the Volume Weighted Average Price (VWAP) as the regional price, applying to non-scheduled market participants?
- Do you agree that dynamic marginal losses should be reflected in LMPs?
- Do you agree that some form of pricing mitigation should be introduced to apply an offer cap on LMPs in certain conditions where the outcome is inefficient?
- Do you think that an ex ante mitigation mechanism is the best method for pricing mitigation? If not, do you have any suggestions?

FINANCIAL TRANSMISSION RIGHTS DESIGN



Type of rights available in auction: continuous rights and time of use rights

Proposal

- **Market participants able to purchase:**
  - **"Continuous rights", paying out at all times of the day**
  - **"Time of use" rights, paying out only when active, at specified times**

Rationale

- Continuous rights simple for participants to use, more fungible, enhancing trade and liquidity in FTRs.
- Time of use rights useful for variable renewable generators to manager their basis risk. Solar output for example is highly predictable.
- More bespoke products where required likely to emerge through secondary market.
- Flexibility in the type of rights is consistent with international markets. In the US, in ERCOT and PJM time of use FTRs are available that pay out in peak and offpeak periods. NZ, which does not have time of use rights, has noted this as an area for exploration.

The proposal is unchanged from the March paper

What revenue or cashflow backs FTRs

Proposal

- **FTRs are backed by settlement residue and auction revenue. Any remaining revenue after a defined period of time would be used to offset TUOS charges for consumers. Any shortfalls should be accounted for by reducing FTR payouts.**

Rationale

- The use of auction revenue in addition to settlement residues makes FTRs firmer, increasing their value which will increase revenue from the sale of FTRs and so on. Additional revenue is ultimately returned to consumers.
- Scaling back FTRs when the funds are exhausted ensures settlement balances while the progressive release of tranches of FTRs helps to manage the likely need for scaling at any point in time.
- Using auction revenue to back FTR firmness is generally consistent with international approaches, in ERCOT, for example, revenue from the auction is used to firm FTR payouts.

The proposal is unchanged from the March paper

Who operates and manages the FTR process

Proposal

- **FTRs sold through a series of simultaneous feasibility auctions run by AEMO, with input from TNSPs used to set the parameters of how many financial transmission rights could be sold. There would be a schedule of tranches ahead of real time.**

Rationale

- This approach ensures that if the transmission network is consistent with expectations when the FTRs were sold, settlement residue is at least sufficient for FTR payouts.
- The progressive release of tranches of FTRs over time can also be used to tailor FTR sales to available transmission capacity.

The proposal is unchanged from the March paper

Transparency around FTR ownership and trade

Proposal

- **AEMO to maintain a register of the amount of financial transmission rights sold at auction, the purchaser and the associated clearing price. This register may also need to capture sale of FTRs into the secondary market and maintain a record of the legal interest in an FTR.**

Rationale

- Transparency is an important component of a well-functioning market. A register maintained by AEMO will be a useful tool that is transparent to the market promoting competitive and efficient market outcomes.
- A register of legal interest in FTR products, allowing for any on-selling, may be appropriate.

The proposal is unchanged from the March paper

Are competition concerns around FTRs an issue

Proposal

- **The Commission continues to consider that no specific market mitigation mechanism be implemented for the FTR market.**

Rationale

- Concerns relating to a lack of competition in the FTR market seem to be unfounded, particularly if non-physical participants are allowed to participate in the auction. This is because:
  - The FTR market does not appear to have features such as high barriers to entry that would suggest this would be a concern
  - We are not aware of this being a particular concern in international FTR markets
  - We are not aware of any specific FTR mitigation measures for hoarding
  - Hoarding does not directly impact the physical dispatch of the system, as FTRs are financial rights and therefore the energy market would still dispatch based on a least cost optimisation.

- The participation of non-physical market participants in the auction, and the register of FTRs sold at the auction and the clearing price should go some way to addressing any competition concerns.

This is an update to the March paper - no proposal was provided in March

Should FTRs be options, obligations or both

Proposal

- **FTRs would be option instruments only, at least initially**

Rationale

- Only offering option instruments results in a simpler regime on day 1
- Stakeholders have indicated that option instruments alone (ie, only ever result in a positive payment to the holder) meet their requirements and there is little demand for obligations (positive or negative payment to/from the holder).
- Internationally, both option and obligation instruments are commonly sold together and most markets started with obligations – international experience suggests there is little demand for obligation instruments

This proposal is unchanged since the March paper

How long in advance should FTRs be available

Proposal

- **FTRs would start being available in small quantities up to 10 years in advance, sold in three month tranches**

Rationale

- Proposal balances enabling market participants to manage basis risk into the future with the ability to provide FTRs that are as firm as they can be while also providing the opportunity for future entrants to purchase FTRs.
- Generally, a longer timeframe than is provided overseas. NZ offers FTRs up to 26 months in advance, ERCOT up to 24 months in advance, PJM up to 36 months in advance.

Position is updated since the March paper – additional information is provided

Who should be allowed to participate in the auction

Proposal

- **Physical and non-physical participants would be able to buy FTRs.**

Rationale

- Allowing greater participation in the auction will likely increase revenue from the sale of FTRs, increase FTR firmness, decrease FTR competition issues and increase TUOS offset. It will also improve FTR secondary market liquidity.
- Internationally, financial participants are included in FTR auctions

The policy position is updated since the March paper – in March non-physical participants were excluded from the FTR auction

Is there a reserve price

Proposal

- **There should not be a reserve price for FTRs.**

Rationale

- Competition in the FTR market should drive FTR prices towards fair value. There are a number of difficulties in defining an appropriate reserve price.
- This is consistent with approaches overseas where there are no reserve prices.

The policy position is updated since the March paper – no recommendation was given in March, pending further analysis and consultation

What combination of FTRs are available – pre-defined nodes

Proposal

- **Reduce the combination of FTRs available to a relatively small number of pre-defined nodes in the early phase of access reform.**
- **Nodes to be defined by the prevalence of congestion on the transmission network, thereby providing FTRs to cover the majority of participant risk and the majority of capacity across key transmission lines on the network.**

Rationale

- Provides simplicity to participants in the early phase of access reform. Scaleable over time.
- May increase liquidity in the FTR instruments that are sold, because of a concentration of trading into a limited number of instruments
- Potentially increases competition in FTR market
- Consistent with international experience in New Zealand which started with two predefined trading locations between which FTRs could be purchased and then increased over time.

The policy position is updated since the March paper – this decision moves away from FTRs being available between regional prices and any local price, which was the decision in March.

How should the STPIS be adjusted to accommodate LMPs and FTRs

Proposal

- **Recommendation that AER adjusts STPIS to be based on the cost of congestion, not instances of material congestion.**

Rationale

- Cost of congestion metric likely to incentivise more efficient TNSP behaviour than a count of material congestion.

This proposal is unchanged since the March paper

Should FTRs hedge losses, if so, how?

Proposal

- **At least initially, FTRs would not hedge price differences that arise due to marginal losses.**

Rationale

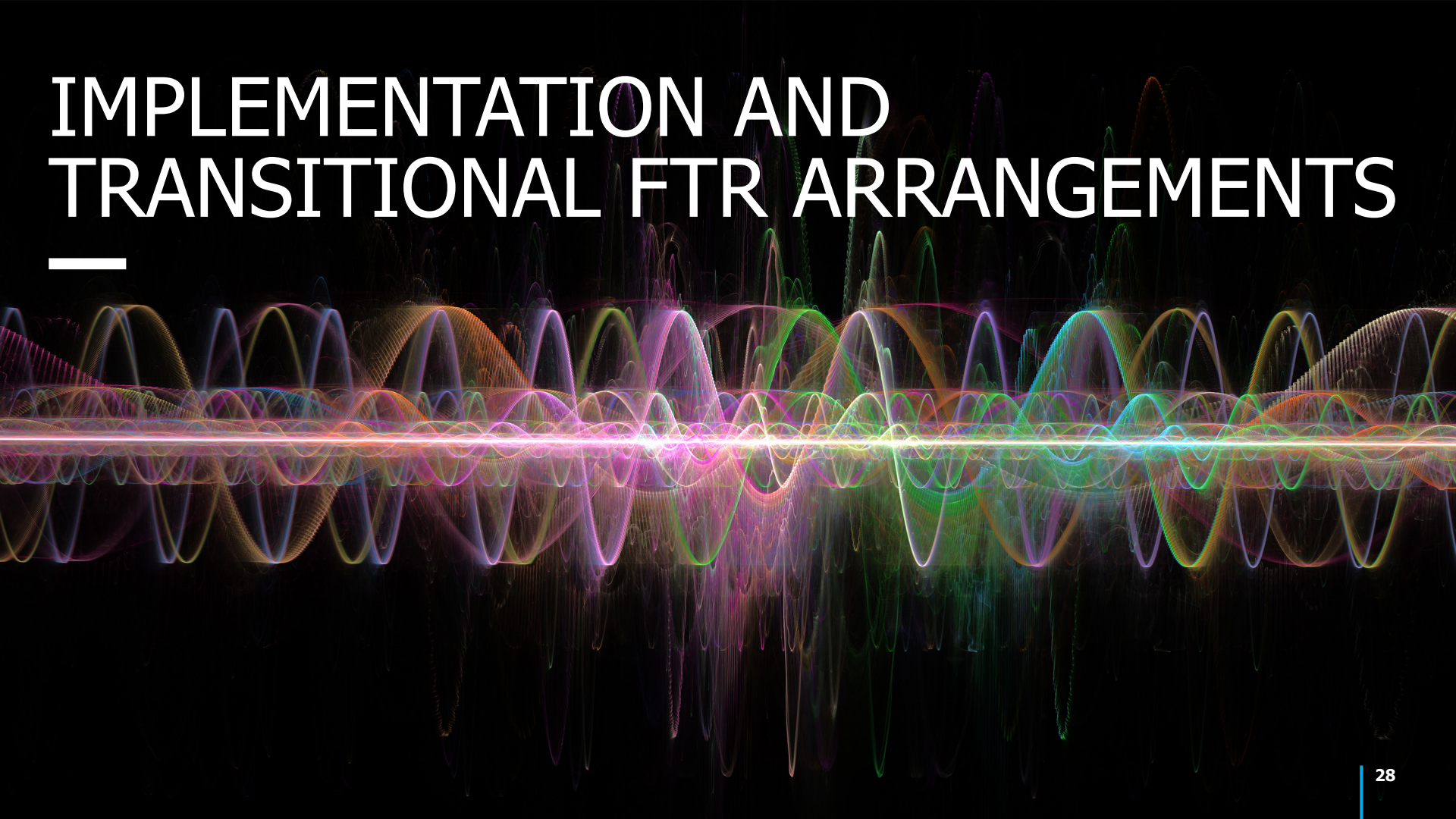
- FTRs could in principle hedge marginal losses. However, such FTRs are complex to design effectively and may reduce the scope for market participants to hedge congestion. We think our proposal is simpler for participants
- FTRs that hedge losses have been introduced only in NZ, where the FTR market has specific features that support this.
- Our proposal is consistent with the US approach. Only NZ offers FTRs that hedge marginal losses.

This proposal is updated since the March paper – no firm decision was provided in March, but a desire was indicated to hedge losses within FTRs

Questions

- Do you agree with FTRs being made available in the auction up to ten years in advance, albeit a small portion of the network capacity? Is this measure useful if the level of capacity made available diminishes over time?
- Do you agree that both physical and non-physical participants should be able to purchase FTRs?
- Do you agree that there should **not** be a reserve price for FTRs?
- Do you see a benefit in terms of simplification with FTRs only being available between a limited number of pre-defined nodes on implementation?
- Do you agree that STPIS should be adjusted to be based on the cost of congestion, rather than instances of material congestion?
- Do you agree that FTRs should not hedge price differences that arise due to marginal losses, at least initially?

IMPLEMENTATION AND TRANSITIONAL FTR ARRANGEMENTS



When will transmission access reform be implemented

Proposal

- **The implementation date should be coordinated with other ESB reforms underway and be in the order of approximately four years after the time the relevant access reform rules are made.**

Rationale

- Coordination with other reforms decreases implementation costs.
- The time between the rule being made and the regime going live would balance obtaining the benefits of transmission access reform as soon as possible with providing time for AEMO and market participants to adjust to the reforms.

This proposal is unchanged since the March paper

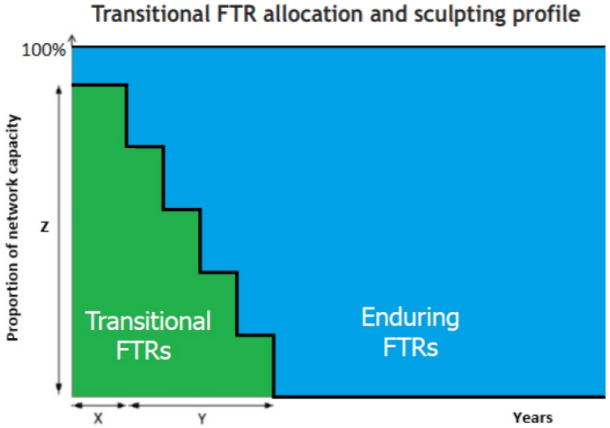
What should the approach to initial arrangements be

Proposal

- **Initial arrangements would include 'transitional FTRs' provided for free, granted for five years with one year of near-full transmission capacity, followed by a four-year sculpting period.**
- **These would be backed by settlement residue. However, auction revenue would not back transitional FTRs.**
- **Secondary trading of transitional FTRs would be allowed.**
- **We are currently considering the ideal method for allocating transitional FTRs between participants.**
- **The cut-off date for market participant eligibility to receive transitional FTRs would be the Transmission Access Reform rule change determination date. In addition, transitional FTRs would not be allocated based on transmission capacity made available after this date.**

Rationale

- Provides incumbents and committed projects with a learning period and a smoother transition while also giving new entrants the opportunity to adjust to the new framework.
- Sculpted transitional FTR allocations help to reduce the foregone wealth transfer to consumers from transitional FTRs and give incoming market participants more opportunities to hedge their risks during this period.
- Using auction revenue to back transitional FTRs would result in a wealth transfer from buyers of FTRs to transitional FTR holders, and hence this is avoided.
- Secondary trading will provide increased liquidity and more opportunities for participants to obtain the number of FTRs they need during the transitional FTRs period.
- To our knowledge, many overseas markets either did not offer similar initial arrangements or allowed for a smoother transition to an LMP/FTR framework to occur in ways that reflected different contexts to the NEM.



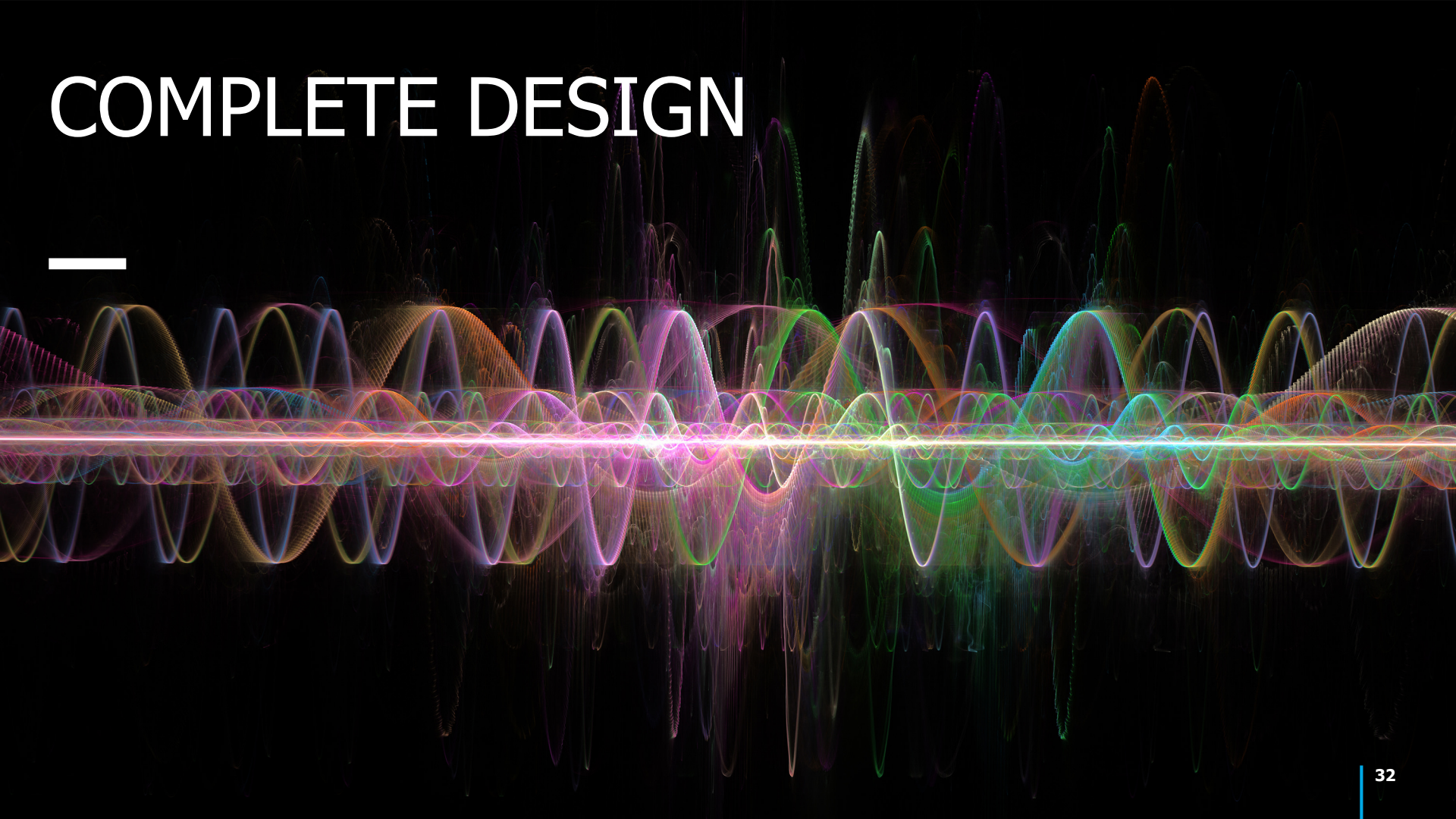
Z represents the first level of FTRs allocated as a proportion of *Tx network* capacity and X is the length of time where Z would be provided. Y is the sculpting period.

This proposal is updated since the March paper

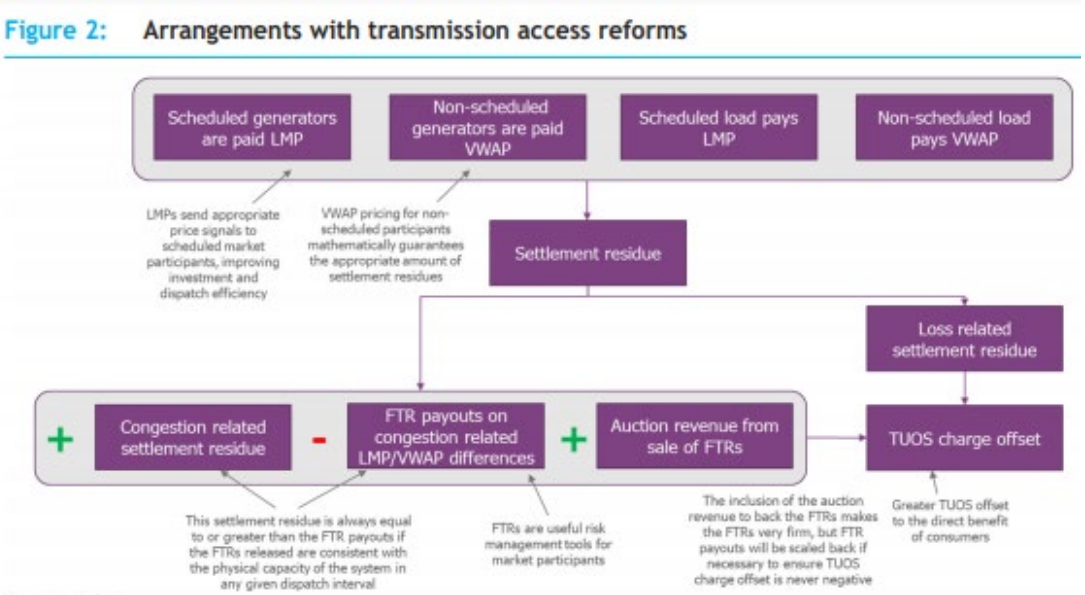
Questions

- Do you agree that the implementation should be coordinated with other reforms?
- Do you agree with the rationale and benefits of the transitional allocation of FTRs?
- Do you consider that the proposals involving sculpting, secondary trading and not backing transitional FTRs using auction revenue are appropriate?
- Do you agree with the proposed eligibility criteria for market participants and transmission capacity allocations?

COMPLETE DESIGN



Questions around the complete design



Does the design make sense as a whole?

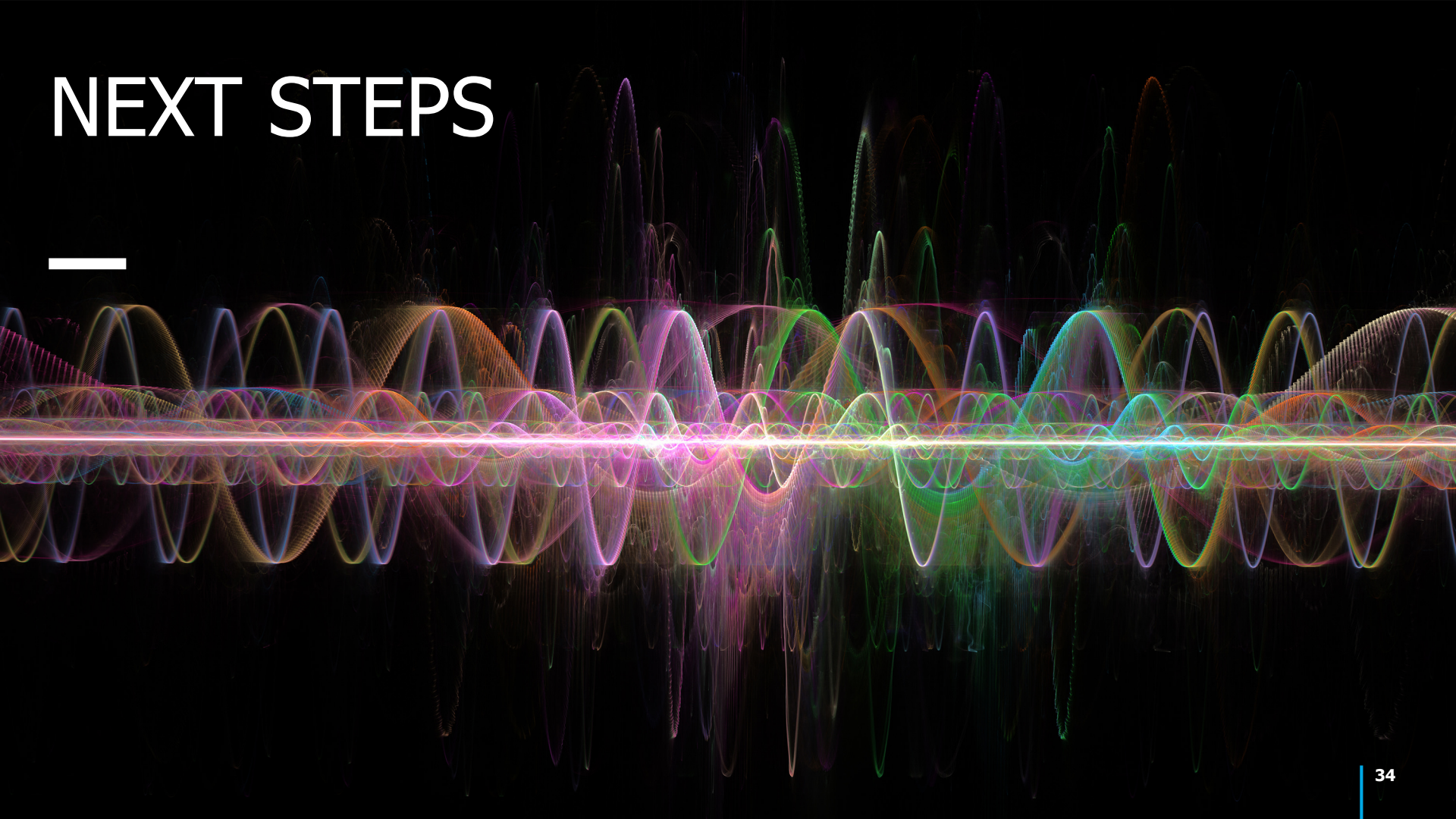
What is missing?

What needs to come out?

Does simplification go too far or not far enough?

Are transitional arrangements adequate, or too much, or too little?

NEXT STEPS



Future COGATI technical working groups

- We expect to undertake additional technical working group(s) post the consultation period on the interim paper. This is likely to focus on our **further analysis of the design** and continuing work on the **implementation costs** of reform.
- Additional work on the design centres around three areas:
  - **Dealing with inefficient high prices** – examining instances of inefficient high prices in the presence of constraints. Implications this has for additional price mitigation mechanisms required.
  - **Pre-defined node definition** – determining pre-defined nodes, the optimal trade off between residual basis risk and additional complexity, and the process and timing for defining new nodes and FTR routes.
  - **Transitional FTR allocation** – Determining the optimal method for allocating transitional FTR allocations.
- We also plan to engage with the technical working group as part of further work assessing the implementation costs of reform. We are in the process of **selecting consultants** to conduct the work and plan to have the consultants engage with participants directly as well as through this forum.

Upcoming work, consultation and deadlines

Industry group forums – now until 19 October 2020

Written consultation

- ESB post-2025 market design consultation paper – closes 19 October 2020
- Interim report: technical specification and cost-benefit – closes 19 October 2020

Continued work on implementation and participant costs – that will involve extensive consultation with members of the technical working group. We will shortly be in contact once a consultant is appointed and we will also organise a session of the working group to run through, aggregated, draft results.

Continued work on elements of the design to develop core elements of a rule package to be progressed with ESB reform – in particular work on simplification and transitional FTRs.

Ongoing bilateral consultation

Please reach out to Russell (russell.pendlebury@aemc.gov.au), Daniela (daniela.moraes@aemc.gov.au) or Ben (ben.davis@aemc.gov.au) for a further discussion.