

Managing Locational Price Risk: Options

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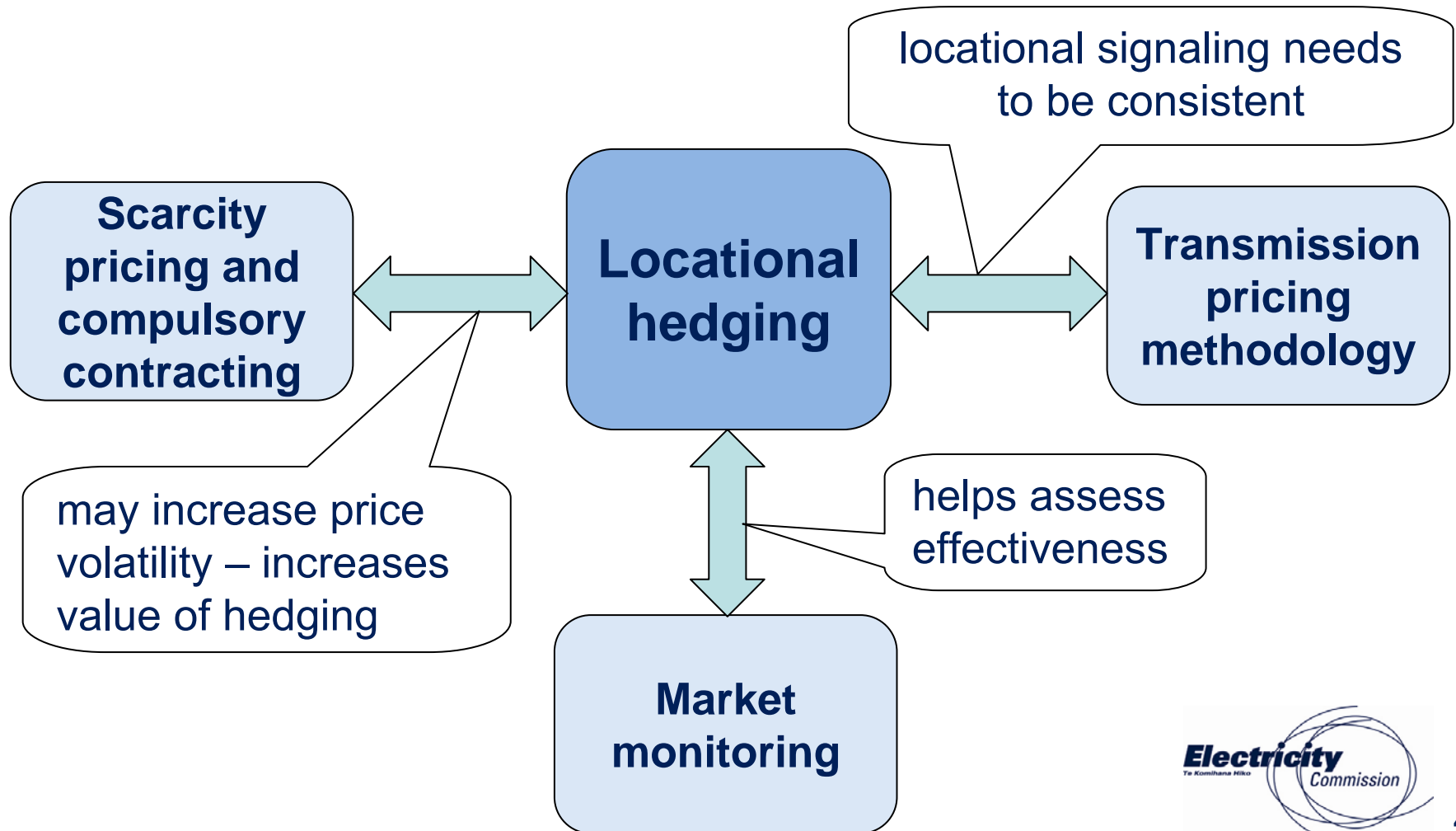
Agenda

- Background
- Problem definition
- Options
- Evaluation
- Initial preferred option
- Timeline

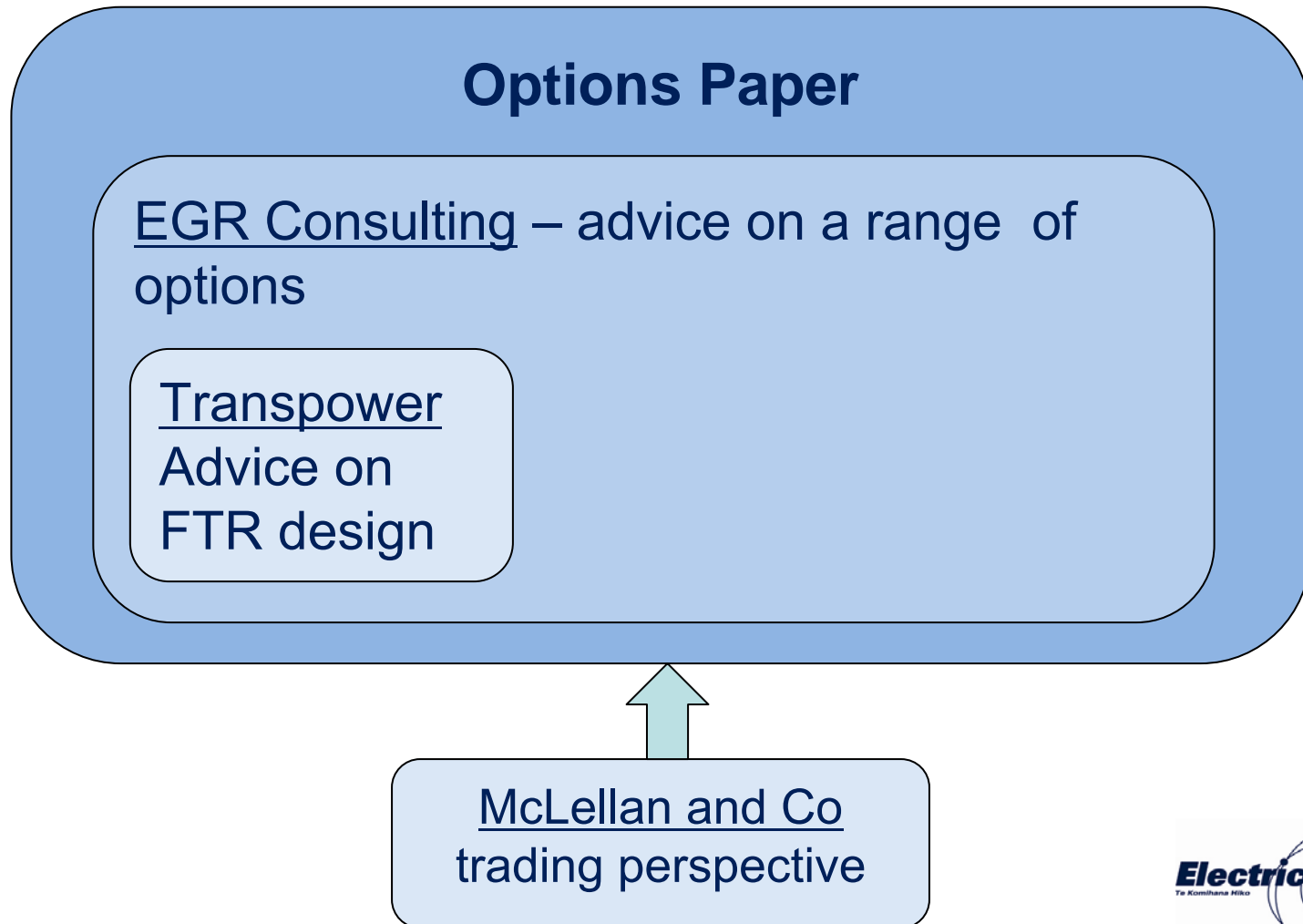
GPS

- Provides guidance on developing arrangements to enable market participants to manage locational price risk (LPR)
- Product developed should:
 - provide long-term risk management
 - improve economic efficiency
 - be pragmatic

Linkages with other MDP projects



Current consultation

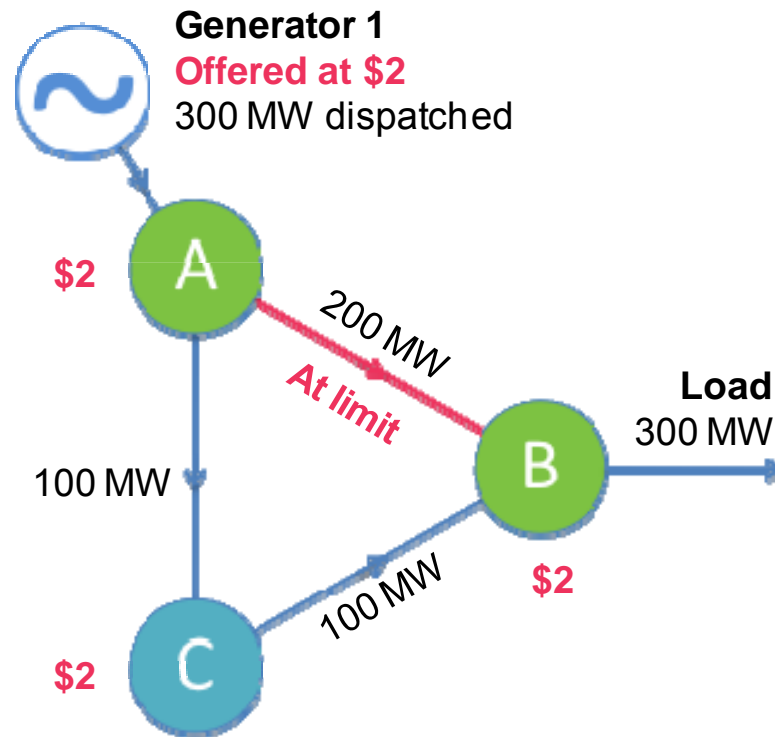


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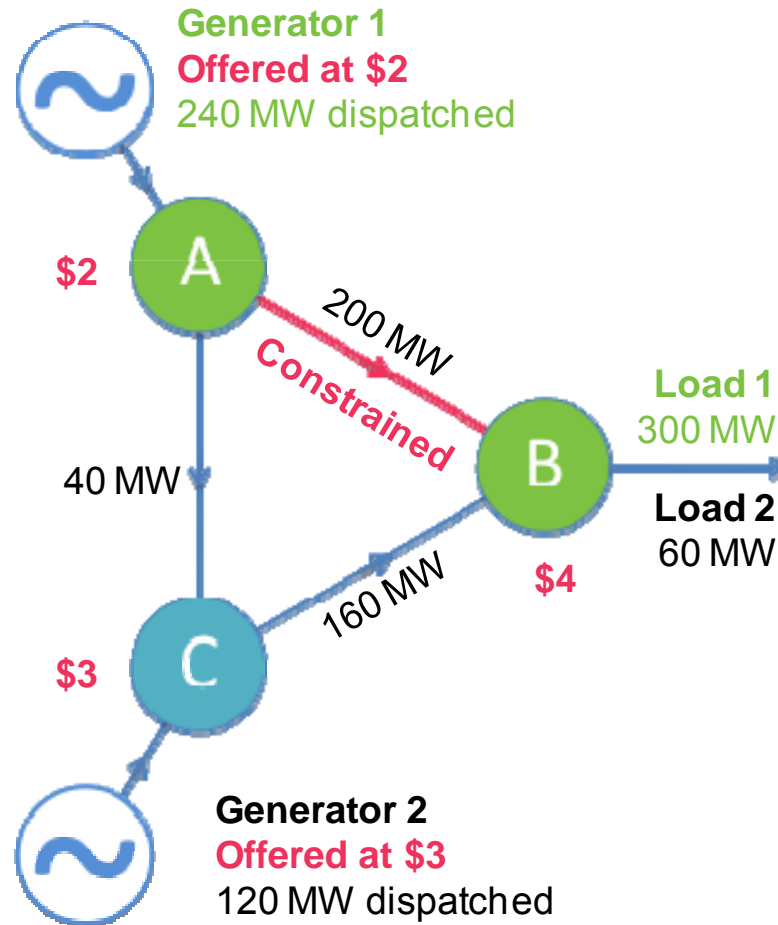
What is locational price risk?

An unconstrained network



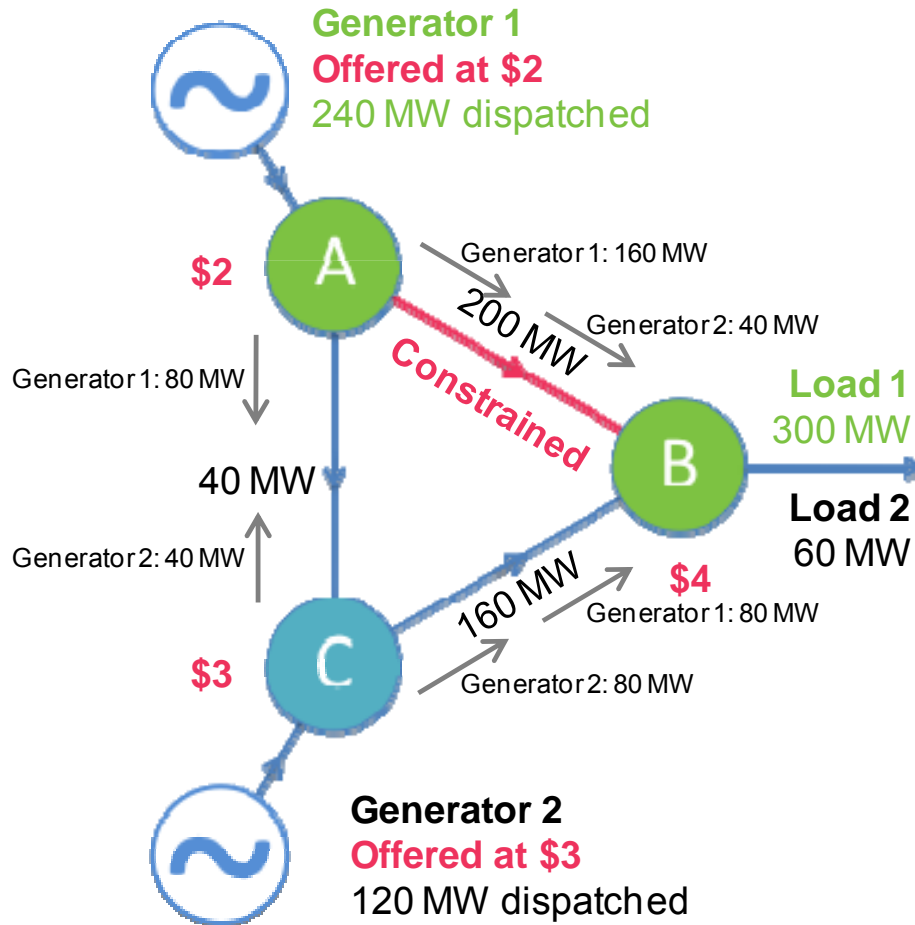
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A constrained network

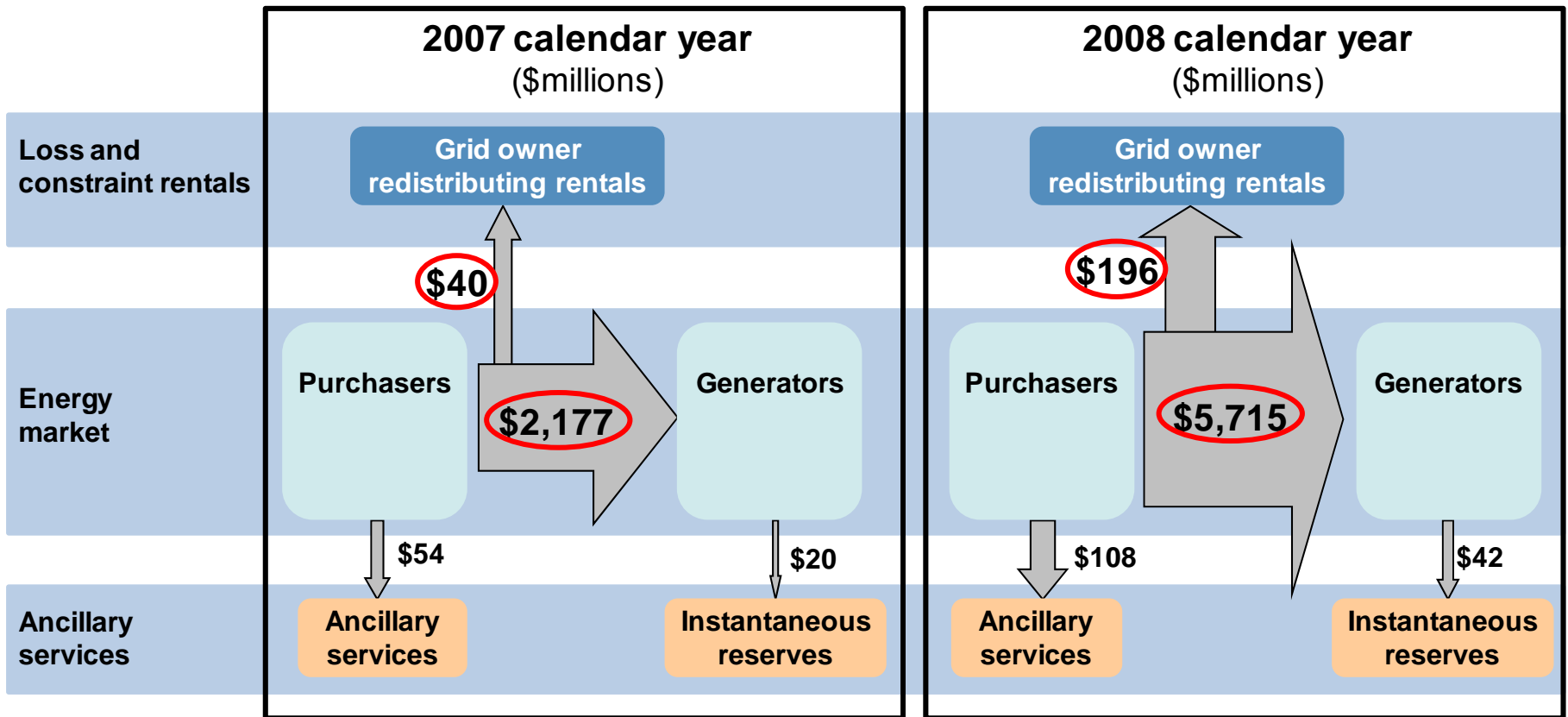


What is locational price risk?

A constrained network



How big a problem is LPR?



Why is LPR a problem?

- Participants limited in how they can manage LPR
- Participants could purchase hedge contracts, but:
 - hedges at central nodes will not offset LPR
 - hedges at local nodes unlikely to cover imported electricity
- Other options generally high cost

Other options are generally high cost

Option	Comment
Hedge at central node	<ul style="list-style-type: none">• does not offset LPR
Hedge at local node	<ul style="list-style-type: none">• limited volume available
Cut load	<ul style="list-style-type: none">• limited capability to cut load
Increase price	<ul style="list-style-type: none">• reduces production and consumption
Build generation	<ul style="list-style-type: none">• not least cost option
Exit market	<ul style="list-style-type: none">• reduces competition
Do not enter market	<ul style="list-style-type: none">• reduces competition
Retailers sell at spot prices	<ul style="list-style-type: none">• end users become more exposed to LPR

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Response to previous consultation

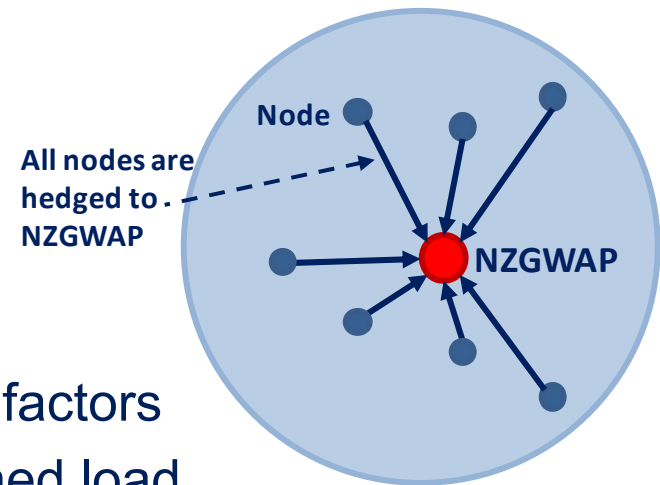
- LRA, FTR and zonal pricing warrant further consideration
- Options Paper considers:
 1. LRA
 2. FTR
 3. zonal pricing
 4. hybrid of LRA and FTR

Option 1 - LRA

LRA: allocates rentals to spot market purchasers in proportion to LPR

Possible design:

- Gross load hedged to NZ GWAP
- Constraints only (not losses)
- 100% hedge (using negative LRA)
- Payments determined using participation factors
- Rentals allocated based on non-constrained load
- Retains locational price differentiation due to losses
- Potentially requires payment for participation



Option 1 - LRA

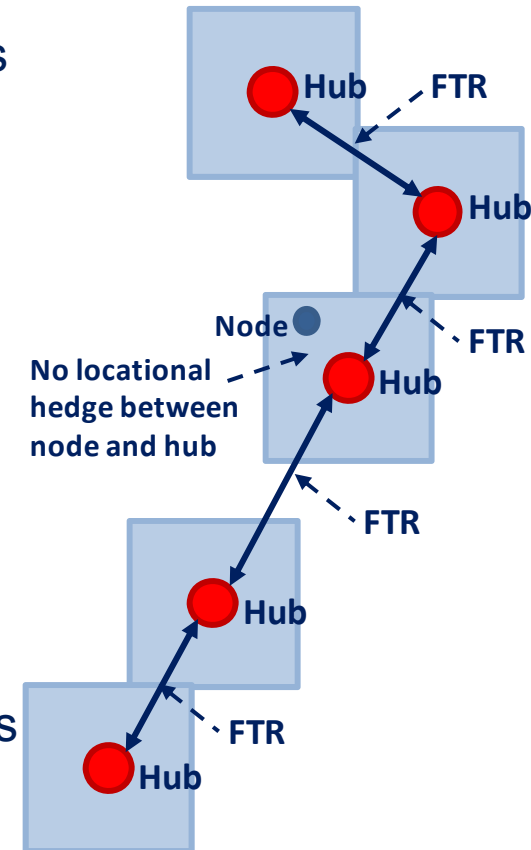
Pros	Cons
<ul style="list-style-type: none">• Simple and low cost• Provides long-term certainty• Improved incentives for purchasers with market power• Enhanced locational signaling for operational purposes• Improves hedge market liquidity as hedged to single price (GWAP)• Preserves locational pricing signals for generation	<ul style="list-style-type: none">• Increase in average prices for some purchasers• May increase incentives for local generation to exploit market power• Passive – may not encourage trading• Could distort long-term locational signals to loads and embedded generation

Option 2 - FTR

FTR: allocated through auctions, provides holder with claims to rentals arising from transmission flows between two points in a specific direction

Possible design (based on advice from Transpower):

- Periodic auctions
- Constraints only (not losses)
- Between limited number of hubs (more than 2)
- One month duration
- “Obligations” (two way) and “Options” (one way)
- Revenue adequacy risk met by FTR market participants
- No pre-allocation
- Residual revenue allocated to current recipients of interconnection rentals



Option 2 - FTR

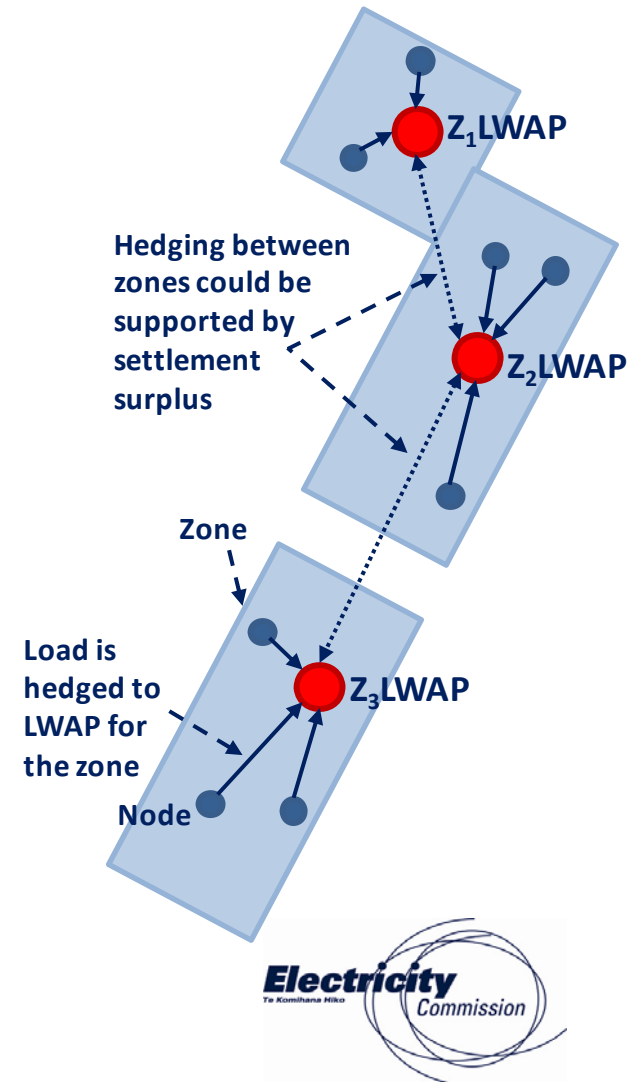
Pros	Cons
<ul style="list-style-type: none">• Preserves locational pricing signals for load and generation• Promotes trading• Participants can match hedging with trading patterns• Loss rentals could be covered without distorting price signals	<ul style="list-style-type: none">• Relatively complex and higher cost• Participants not guaranteed they will obtain hedges they need• Will not provide complete hedge for all nodes• May make entry more challenging (because of complexity and cost)

Option 3 – zonal pricing

Zonal pricing: load (and possibly generation) at all nodes within zone subject to same price

Possible design:

- Load prices set to load-weighted average price for zone (ZLWAP)
- Nodal pricing for generation
- Settlement surplus between ZLWAP and zonal supply-weighted average price (ZSWAP) used for intra-zonal hedging
- Inter-zonal settlement surplus used for hedging between zones
- Price at each node adjusted for losses



Option 3 – zonal pricing

Pros	Cons
<ul style="list-style-type: none">• Simple and low cost• Improves hedge market liquidity because small number of zones	<ul style="list-style-type: none">• Removes intra-zonal locational price differentiation• Removes price signaling for constrained trading periods• Does not manage LPR between zones• If coupled with FTR delivers few additional benefits over hybrid• Inflexible – difficult to change back to nodal pricing

Option 4 – hybrid of LRA and FTR

Hybrid: rentals allocated in regions using LRA with FTR between regions

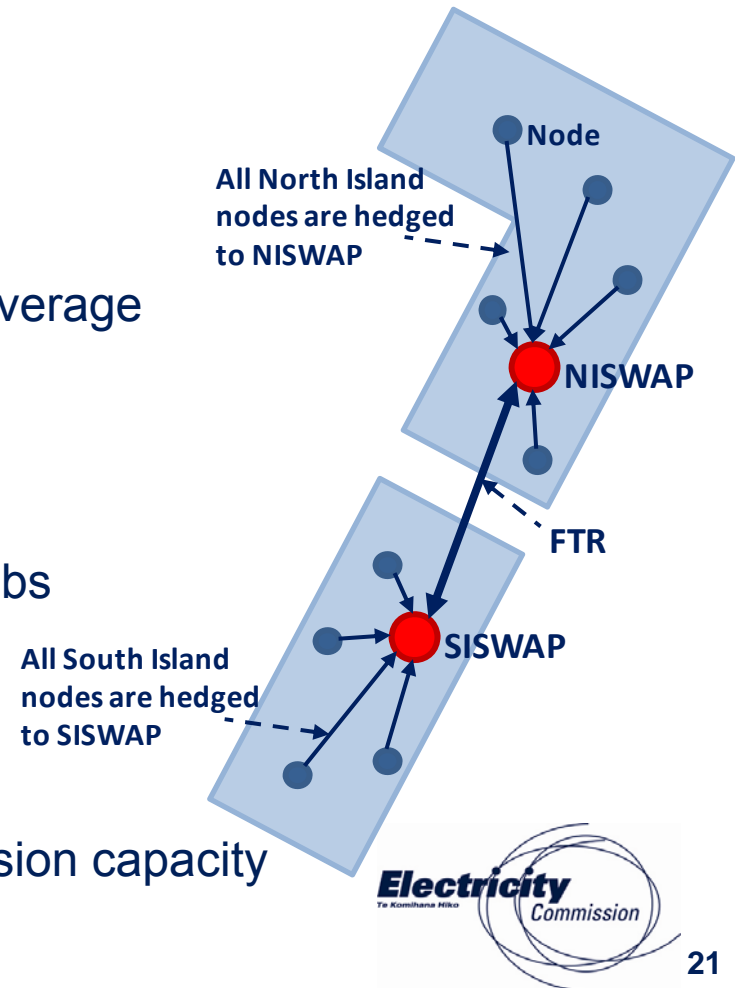
Possible design:

LRA component:

- Separate LRA for each island (NI and SI)
- Loads hedged to island supply-weighted average price (ISWAP)

FTR component:

- FTR between notional NI and SI supply hubs (NISH and SISH)
- Constraints and possibly losses
- Allocated through periodic auctions
- FTR payments “scaled” to match transmission capacity



Option 4 – hybrid of LRA and FTR

Pros	Cons
<ul style="list-style-type: none">• Locational hedge for LPR between islands (largest source of LPR)• Long-run locational price differentiation between islands• Promotes trading (at least inter-island)• Improves hedge market liquidity because only two trading hubs• Fewer purchasers face increase in average price	<ul style="list-style-type: none">• More complex and costly than LRA• Some distortion to pricing signals for embedded generation in short term• Some distortion to long-term pricing signals for load location

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Benefits

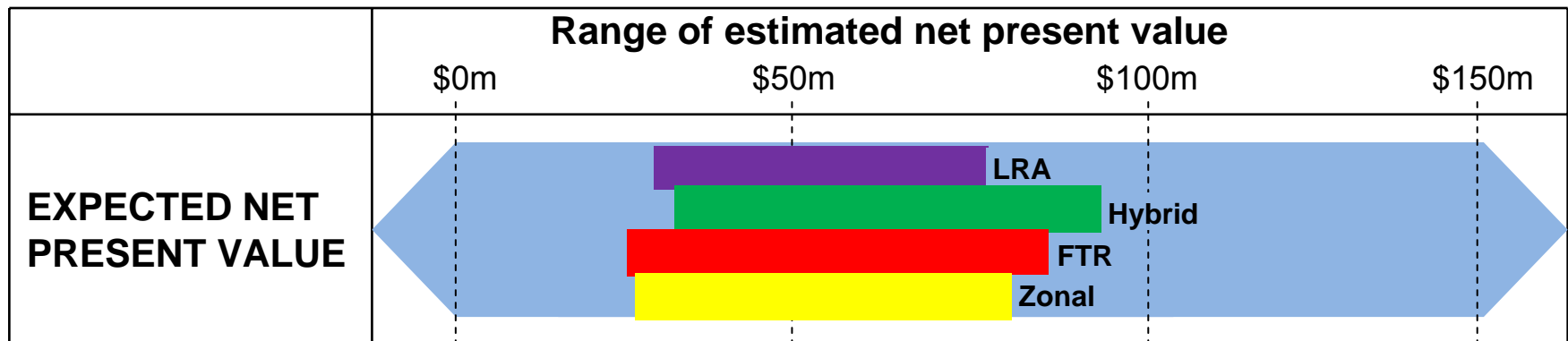
Benefit	Best performer	Worst performer
LPR management	FTR: firmest hedge between hubs (quantity terms)	LRA: least firm hedge
Hedge market liquidity	Hybrid: only requires hedges to be traded between two hubs	LRA: passive involvement only
Competition	Hybrid: improves hedge market liquidity, addresses LPR within islands, firm hedge between islands	FTR: difficult for new entrants to obtain FTR, no hedge between hubs and nodes

Costs

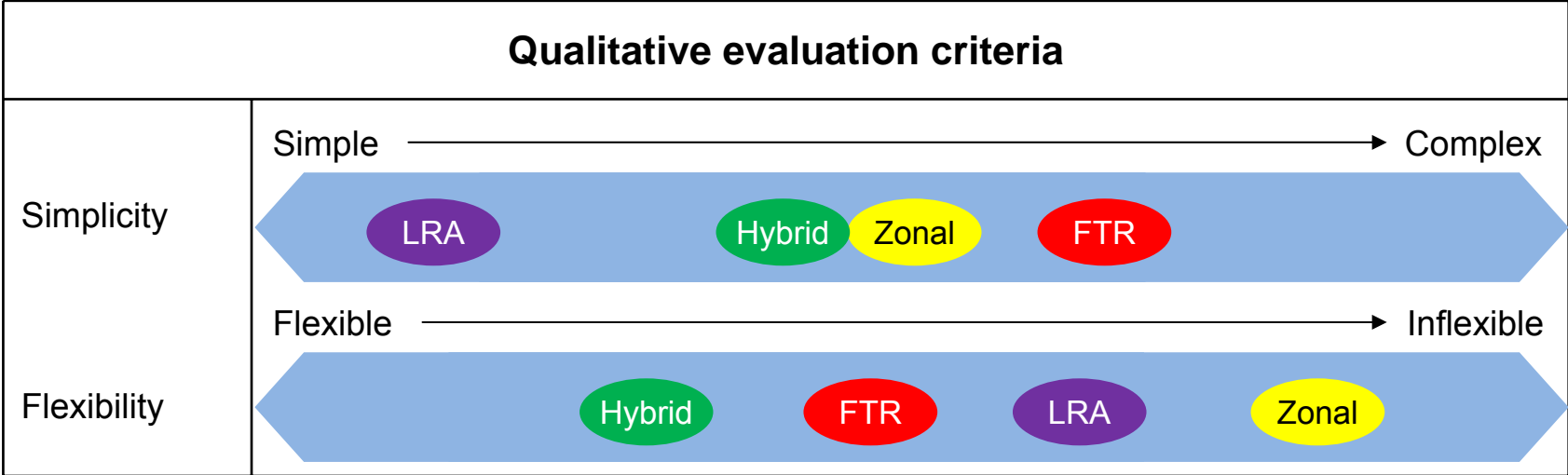
Cost	Lowest cost	Highest cost
Development and implementation	LRA: no auction system required	Hybrid or zonal: require auction system (if FTRs between zones) and LRA/zonal component
Ongoing running costs	LRA: no auctions	FTR and zonal: require auctions between more than two hubs (if FTRs between zones)
Participation costs	LRA: only requires passive involvement	FTR: requires active involvement in auctions
Distortion to price signals	FTR: no impact (no relationship between rental payments and consumption)	Zonal: direct relationship between zonal price and consumption

Net present value of options

- Hybrid has highest expected net present value:
 - has highest expected benefits – particularly improving hedge market liquidity
 - is reasonably low cost



Other evaluation criteria: qualitative



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Hybrid: initial preferred option

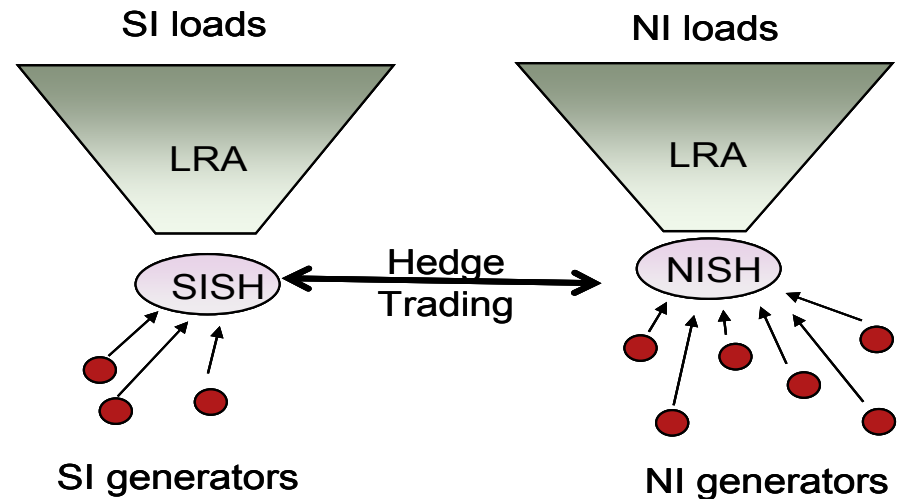
Amendments to design:

LRA component:

- Allocation in proportion to non-constrained annual average gross load
- No hedging for loss rentals

FTR component:

- Constraints and losses
- One quarter duration (up to six consecutive quarters available)
- Quarterly auctions
- Bilateral secondary trading permitted



Hybrid: implementation

LRA component:

- Implementation involves:
 - incorporation of algorithm into clearing and settlement
 - making LRA payments
- Could be provided by Clearing Manager

FTR component:

- Implementation involves:
 - determination of FTR and revenue adequacy
 - conduct of auctions
 - payment of rentals and FTR revenue
- FTR provider determined through competitive tender
- Some functions could be provided by other parties (e.g. payments by Clearing Manager)

Hybrid: unresolved issues

- Ancillary services – e.g. recent North-South price differences, not rentals
- LRA payment for participation
- Distribution of revenue
 - LRA payment
 - loss rentals
 - FTR auction
- Assessment and treatment of market power implications

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Timeline

Submissions on Options Paper due	5 December 2009
Detailed proposal paper released	Early-2010
Recommendation made to Minister	Mid-2010
Pilot	Early-to-mid 2010
Implementation of preferred option	Late-2010