snowy hydro Limited

renewable energy

Regional Boundaries

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Background Context

- Complex issue involving multiple stakeholders.
- Complexity extends to technical, economic, commercial, and political issues.
- In brief, Snowy Hydro believes that there are 5 key issues that must be addressed with any proposed change in regional boundaries:
  1. Retail pricing constraint (one retail pricing node for each jurisdictional boundary)
  2. Change in business enterprise value (or **perception** of value change with region changes, ie. winners / losers)
  3. Market efficiency drivers including physical dispatch, financial/contract market, and long term investment decisions
  4. Lead time risks (for changes to market risk and to allow for the emergence of alternative solutions eg. transmission augmentation)
  5. Transmission Role

Solutions and Reactions

- Theoretically there is a range of solutions but there will also be corresponding reactions to each solution

Solution Option	Retail Pricing	Enterprise Value	Market Efficiency	Lead Time	Transmission Service
1. Status Quo (Not Working)	✔	✔	✕	?	? or ✕

Not working – system security concerns, sub optimal dispatch, bandages to underlying problem through use of constraint formulations (Both Option 1 & 4 blatantly inefficient)

Solutions and Reactions

Solution Option	Retail Pricing	Enterprise Value	Market Efficiency	Lead Time	Transmission Service
1. Status Quo (Not Working)	✔	✔	✕	?	? or ✕
2. Problem by problem incremental fixes	✔	✔ or ?	✕	?	?

Ie. Snowy region split is a solution for only 1 burning issue. Impossible to explicitly predict future congestion points and hence will require a transparent & objective method to deal with constraints.

Solutions and Reactions

Solution Option	Retail Pricing	Enterprise Value	Market Efficiency	Lead Time	Transmission Service
1. Status Quo (Not Working)	✔	✔	✖	?	? or ✖
2. Problem by problem incremental fixes	✔	✔ or ?	✖	?	?
3. Fully automatic region boundary changes, if meets an objective set of criteria (Uncertainty)	✔	✖	✔	✖	✔ or ?

Lead time problems, and potentially constrains long term contracting.

Solutions and Reactions

Solution Option	Retail Pricing	Enterprise Value	Market Efficiency	Lead Time	Transmission Service
1. Status Quo (Not Working)	✔	✔	✖	?	? or ✖
2. Problem by problem incremental fixes	✔	✔ or ?	✖	?	?
3. Fully automatic region boundary changes, if meets an objective set of criteria (Uncertainty)	✔	✖	✔	✖	✔ or ?
4. Full nodal pricing with FTRs (Uncertainty)	✔	✖	?	✔	✖

Probably long term Solution,
but do we need to introduce complexity
for all parts of the network.

Solutions and Reactions

Solution Option	Retail Pricing	Enterprise Value	Market Efficiency	Lead Time	Transmission Service
1. Status Quo (Not Working)	✔	✔	✖	?	? or ✖
2. Problem by problem incremental fixes	✔	✔ or ?	✖	?	?
3. Fully automatic region boundary changes, if meets an objective set of criteria (Uncertainty)	✔	✖	✔	✖	✔ or ?
4. Full nodal pricing with FTRs (Uncertainty)	✔	✖	?	✔	✖
5. Gatekeeper with Option 4 constraint formulations	✔	?	✔	✔	✔

This offers a pragmatic, defined, and efficient transitional solution which can be implemented quickly.

Gatekeeper with Option 4 constraints

- The defined and efficient transitional solution that satisfies the 5 key issues is the Gatekeeper with Option 4 constraint formulation.
- This solution:
  - Removes the need for “Fully Automatic Region Boundary Changes” – when the problem occurs it is not a burning issue
  - It can be applied everywhere using constraint formulations, but is visible only in problem area
  - Still allows for regional boundary changes that meet the yet to be determined specified criteria (while allowing for different technologies to emerge and address transmission constraints ie. transmission augmentation or new generation)
  - Path of least stakeholder resistance (pragmatic solution)
  - The solution does not preclude other solutions that may emerge in the longer time frames

Gatekeeper Concepts

- Keep it simple!
- Must be positive rewards and negative penalties
- All generation treated equally (old & new entrant)
- Allocation (if required) based on MWs on the wrong side of the constraint
- Negative (efficient) SRAs can generally be avoided by selecting alternative pricing node

Regional Boundary Criteria with Option 4/Gatekeeper

- The constraint needs to be very material. Hence not just constraint but significant price separation leading to a material financial impact
- Long notification timeframe is required to minimise market disruption
- Without a transitional vehicle, the only real solution may be full nodal pricing