# Problem definition

Analysis to date shows dis-benefit (but negligible) from additional locational signaling

Yet the location signals currently sent to investors are significant

- $9/MWh to a new SI entrant when compared to any NI generation project
- A difference of around $4/MWh between a new SI entrant and the largest SI generator

Simply put, when investors are considering investment in new generation, if all things are equal between projects, the HVDC allocation strongly favours:

- Projects built in the North Island over the South Island; and
- Within the South Island it favours projects built by companies with a large share of generation over new entrants and companies with a small share of generation

These figures are significant and with investors working hard to ensure projects are economic, this difference can materially distort the generation investment playing field

With respect to the South Island issue this effectively means the exact same new generation project will have different costs depending on who owns it

# A proposed alternative perspective

- An alternative argument (for the SI problem only) was presented that contradicts this perspective, arguing that all parties face the same marginal cost signal to build a new plant, irrespective of their current share of generation

- This analysis is founded on “re-framing” the HVDC opportunity cost estimate made by the proposer of a new investment

  - An earlier perspective was to compare the investment choice of a new generator against a status quo of no other investment. That resulted in large share generators facing a diluted marginal cost when compared to new entrants or small investors – i.e. an unlevel playing field.

  - An alternative perspective has been proposed, comparing DC charges if one party built instead of the other:
    - Investor A assumes that investor B will invest if A does not; and vice versa; and
    - Only one station will be built with certainty, and only one player can build it.
  - This perspective suggests the marginal cost signal to all parties is the same

# Choosing the right perspective is critical

- The proposed argument has highlighted the importance of choosing the correct perspective
- Both the original perspective and the alternative analysis use (in my opinion) incorrect frames of reference
- Alternatively it is proposed that investors know that (based on experience with real investment decision making):

1. There is no fixed quota for generation built at any one time
2. Generators do not play “first-come best dressed”: for example if Generator A builds a South Island wind farm, this dose not alter whether Generator B also builds one in the South Island
3. South Island demand growth can be served by new South or North Island power stations
4. Both investors do not know (without colluding) what the other party intends to do

# Expanding on the worked example

- In the proposed perspective there are three states of the world: Situation A:= no-one invests, Situation B:=Only generator A invests , Situation C:=Only generator B invests
- To those situations we must add a fourth possibility: Situation D:= both generator A and Generator B invest. All four situations are shown below:

| | HVDC Charges in Each Situation | | | | |
|---|---|---|---|---|---|
| | Investor A | Investor B | Others | Total | |
| Situation A - Status Quo | $50.000m | $0.000m | $50.000m | **$100.000m** | |
| Situation B - New Investment of 50MW by Generator A | $50.617m | $0.000m | $49.383m | **$100.000m** | |
| Situation C - New Investment of 50MW by Generator B | $49.383m | $1.235m | $49.383m | **$100.000m** | |
| Situation D - New Investment of 50MW by Generator A & B | $50.000m | $1.220m | $48.780m | **$100.000m** | |

- The original perspective was that the status quo was no investment. So Investor A comparing “sit A” with “sit B” saw a $0.617m HVDC cost lift, while Investor B (with a smaller market share) comparing “sit C” with “sit A” saw a $1.235m HVDC cost increase. The larger generator sees lower marginal cost.
- The recent perspective argues the status quo is: Investor A assumes that investor B will invest if A does not; and vice versa. Investor A will compare “B” with “C” for $1.235m HVDC cost lift, while Investor B will compare “C” with “B” to see $1.235m HVDC cost increase. This recent perspective therefore argues that both investors see the same cost.

# The appropriate perspective for a market

- Both the original perspective and the alternative analysis use flawed frames of reference, in my opinion,. Recapping:
  - Competitor's do not know what each other intend to do
  - Competitor's plants are not substitutes. There is a national market for new generation to meet demand, sufficient growth for multiple projects to occur simultaneously or with very close timing. This has been the market experience
  - A relatively unconstrained transmission network enables generation in either island to be built to serve demand in either island
- A correct framing of "status quo" has investors asking a different question :
  1. "if the other guy isn't going to invest, what happens to my HVDC charge when I invest?" Investor A compares "sit B" with "sit A" ($0.617m). Investor B (asking the same question) compares "sit C" with "sit A" ($1.235m)
  2. "If the other guy is going to invest, what will happen to my charge when I also invest?" Investor A compares "sit D" with "sit C" ( $0.617m). Investor B (asking the same question) compares "sit D" with "sit B" ($1.220m)
- We are back to the original result: the largest generator has lowest marginal HVDC cost: $0.617m, while smaller Investor B faces an HVDC cost circa $1.23m.
- Investor B faces higher cost than investor A for what is otherwise an identical new station
- **In simple terms, a South Island generation project is cheaper if investor A is the owner and not investor B**