Masterclass on COGATI, ISP, etc

Consumer Roundtable, Brisbane

June 2019

- Relevant processes underway
- Background and scene setting
- Afternoon tea
- A framework for improving things
- What are our next steps

Relevant reforms underway

- AEMC's COGATI review
  - 2017 review: everyone finding their way
  - 2019 review: Congestion -> Access -> Transmission charging
- ESB's actioning the ISP
  - Streamlining group 1 projects
  - Embedding ISP into NEL/NER
- AEMO's development of ISP
  - Scenarios and assumptions
  - Modelling methodology
- Various others
  - AEMC rule changes, AEMO registration of storage, AEMO MLF, ESB post-2025,

Background – Signals and drivers for new gen investment

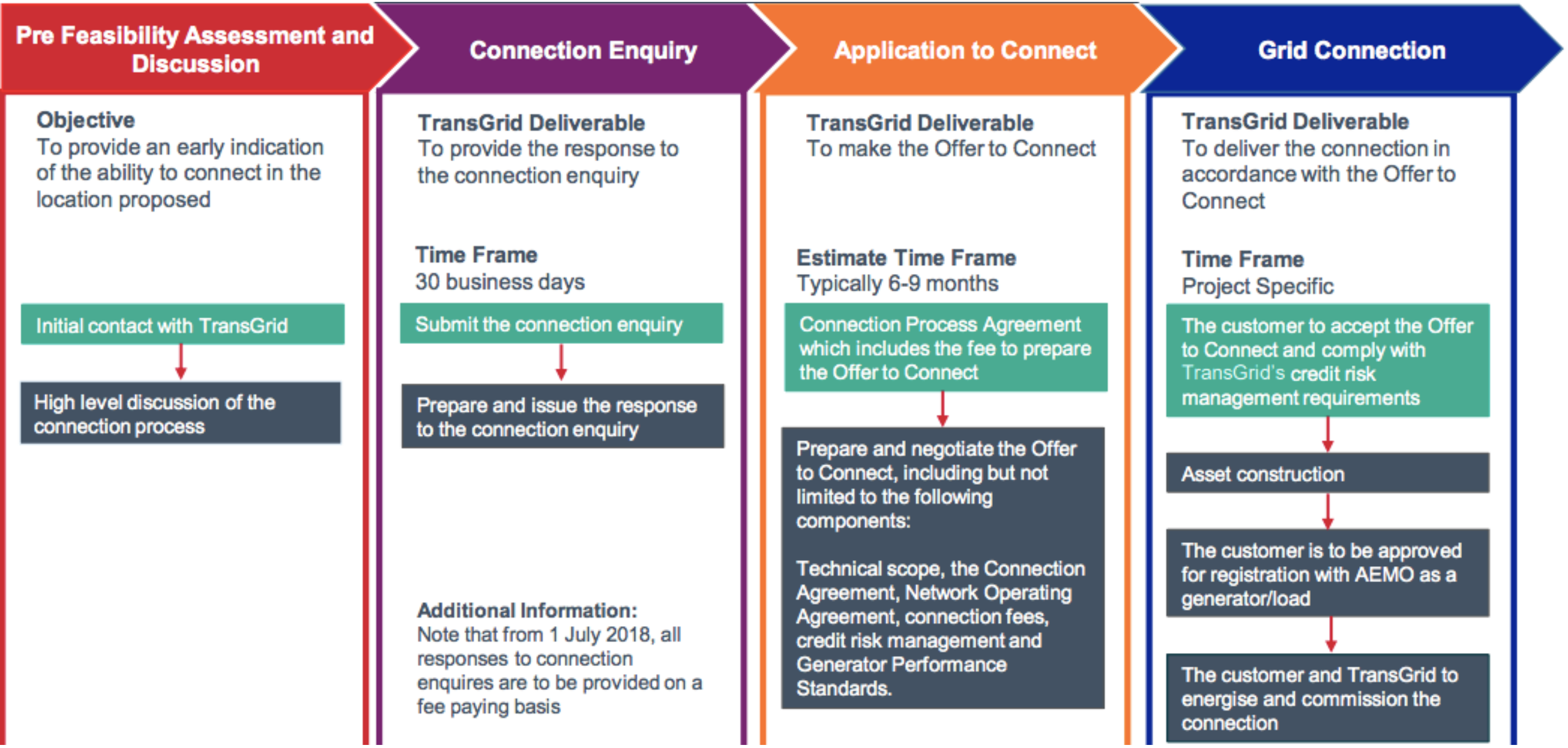
- Potential revenue driven by a range of potential streams:
  - Wholesale spot prices
  - Contracting/hedging across portfolio
  - Ancillary services
  - Ability to contract their generation to a retailer or buyer – eg: through PPAs, etc
- These are at best region-wide or NEM-wide (ie not very location specific)
- The cost of their impact on the particular location in the network is relatively small part of what generators face directly

Background - New gen connection

- Generator goes to incumbent TNSP for connection – process is well set out in the Rules (often some informal tyre-kicking before the formal process commences)
- TNSP assesses impact from proposed generator connecting to the network in terms of system security, strength, etc
- TNSP is restricted in sharing info about other connection applications
  - Lost opportunities for scale efficient connections
  - One connection application can change if another party proceeds faster than you
- Some design and construction work must be done by the incumbent TNSP, some can be contestable. Rule change in 2017 opened up more to contestability

Background - New gen connection

- In order to connect, the TNSP may need to upgrade some parts of their network and the generator may need to modify some aspects of their connection arrangement. Parties negotiate a compromise (framework set out in the Rules)
- Gen pays for shallow connection costs only
  - not the deep connection costs which are payed through TUOS



https://www.transgrid.com.au/what-we-do/our-network/connections-and-modifications/connection-process/Pages/default.aspx

Background – Generator Access

- Open Access regime
  - First come first served
  - Anyone has a right to physically connect to the network
  - No one has a right to actually get dispatched
- Reflected in how TUOS charges are allocated
  - Generators don’t pay TUOS – only loads
- Congestion and generators being constrained off from dispatch
  - Less generation potentially available
  - Higher prices (potentially opportunities for gaming)
  - Existing generators being affected by new connections – impacts on contracts as well as MLF

Background – Transmission planning and investment

- While generators currently have no guarantee of network capacity to export, TNSPs have an obligation to meet reliability standards for their networks for loads.
- However, RIT-T does allow for transmission investments under “market benefits” – essentially more efficiently meeting load by allowing for more/cheaper generation
  - Relied heavily in the RIT-Ts coming out of the ISP
  - Modelling assumes certain generation connecting at certain times and places
- Modelling and planning of new gen connections by AEMO/TNSP doesn’t necessarily match what happens
  - System-wide outcome vs individual outcome

Background – How costs are passed through to consumers

- Generator
  - Connection, fuel, contracting, ancillary service costs
  - Only if generator (portfolio?) is successful/valued in NEM*
  - Scope for asset write-downs or revaluations
  - Costs recovered from consumers via wholesale component of bills
- Regulated transmission
  - Shared network, deep connection assets, O&M costs
  - Revenue regulation and RAB means no scope for write-downs or revaluations
  - Only nominally linked to value to the NEM at the time of investment
  - Recovered through TUOS charges, limited ability to spread/allocate costs

Framework for improving things

- Problem definition
- Objectives we want to achieve for consumers
- Barriers to achieving these
- Some possible solutions

Problem definition

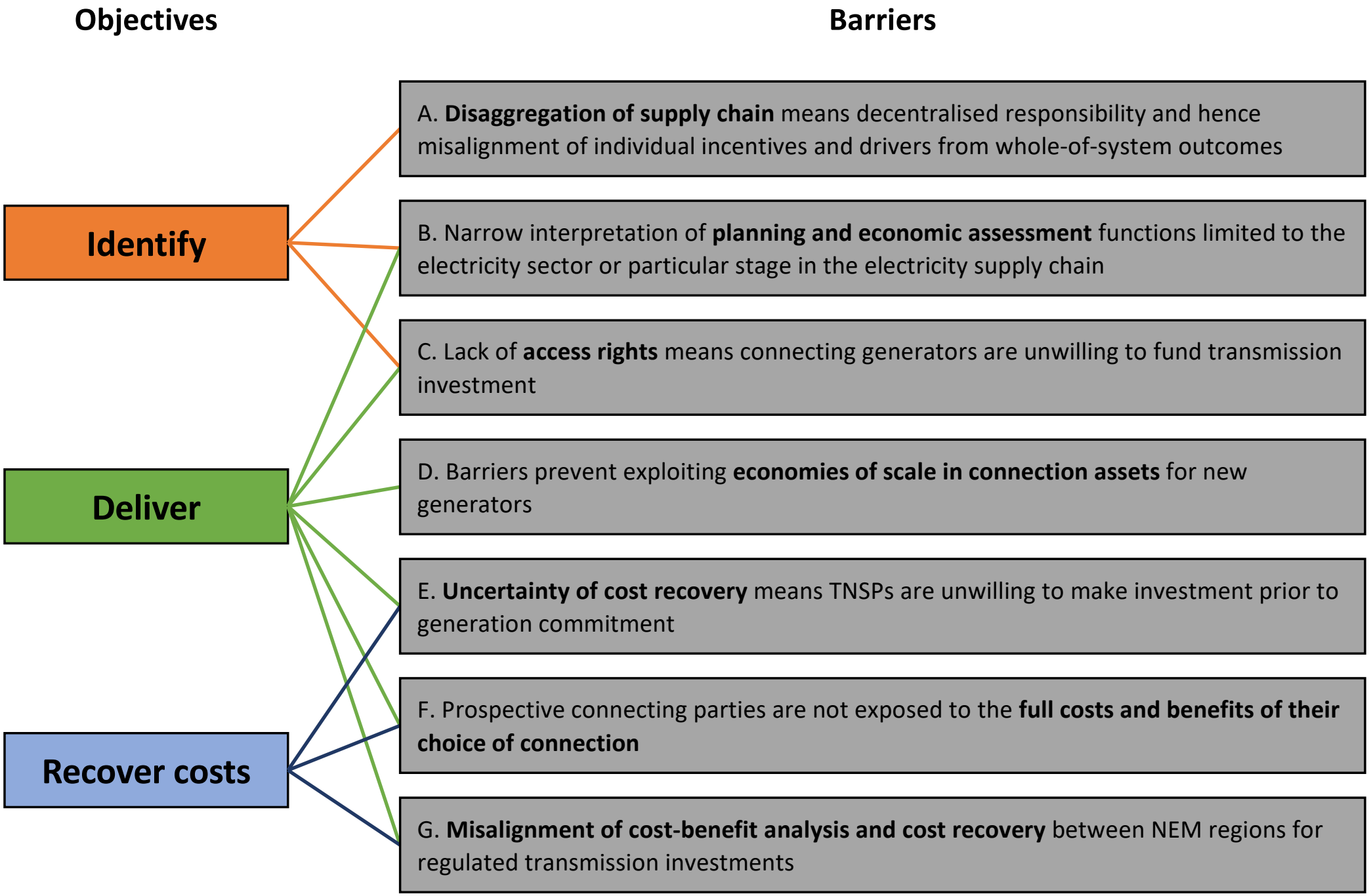
- The current regulatory framework is designed to deliver efficiency of incremental investment to a centralised generation and transmission system which has already been ‘built out’.
- The transformation the NEM is currently going through is not incremental – it is a step change.
- What is needed is a planning and investment framework which delivers efficiency for strategic, whole-of-system investments in order to ensure this transformation is delivered in a timely and cost-effective manner.

Problem definition

- **Inefficient generation investment** – sizing of new generators; location and impact on the network; cost to connect each individual generator; otherwise efficient investments which do not occur; geographic and fuel diversity of the generation fleet as a whole.
- **Inefficient network investment** – in terms of the shallow and deep connection assets; interconnection to make the most of fuel diversity and maintain reliability; and the ability to maintain system security and stability.
- A lack of coordination between generation and network meaning **consumers pay twice to solve a problem once**.
- Missed opportunities to exploit **economies and scale and scope**.
- A longer and more expensive **transition to a low- or zero-emissions** energy sector.

Objectives

- **IDENTIFY** the most efficient system-wide solution.
- **DELIVER** the solution in a timely and efficient way.
- **RECOVER COSTS** for the delivered solution in the fairest and most equitable way.


Objectives
Barriers
Identify
Deliver
Recover costs
A. Disaggregation of supply chain means decentralised responsibility and hence misalignment of individual incentives and drivers from whole-of-system outcomes
B. Narrow interpretation of planning and economic assessment functions limited to the electricity sector or particular stage in the electricity supply chain
C. Lack of access rights means connecting generators are unwilling to fund transmission investment
D. Barriers prevent exploiting economies of scale in connection assets for new generators
E. Uncertainty of cost recovery means TNSPs are unwilling to make investment prior to generation commitment
F. Prospective connecting parties are not exposed to the full costs and benefits of their choice of connection
G. Misalignment of cost-benefit analysis and cost recovery between NEM regions for regulated transmission investments

- **A. Disaggregation of the supply chain means decentralised responsibility and hence misalignment of individual incentives and drivers from whole-of-system outcomes**
- In many other jurisdictions the optimal whole-of-system outcome is planned and delivered by a central planning authority.
- In the NEM, there is no such centralised authority and this role is instead delegated to market forces through a combination of price signals and regulatory oversight.
- This is especially problematic where a structural change in the transmission and generation system is required rather than incremental expansion and maintenance.

- **B. Narrow interpretation of planning and economic assessment functions limited to electricity sector or particular stage in the electricity supply chain**
- Planning has been based more around incremental investment efficiency rather than whole-of-system optimisation – meaning that each investment is assessed in isolation and not necessarily as an interrelated suite of investments.
- Continuing to do so risks overlooking the benefits, costs and hence trade-offs which arise from the interrelation of multiple projects. This is especially the case where the projects have substantial impacts across the NEM.
- Under the current planning and regulatory frameworks, the use of demand-side options to address both supply and network issues has been limited.

- **C. Lack of access rights means connecting generators are unwilling to fund transmission investment**
- Under the current open access regime for generator connection to the transmission network, while they have a right to connect, no generator has any right to access the regional reference node.
- Instead, generators may not be dispatched (either only partially dispatched or not dispatched at all) by AEMO due to constraints in the network.
- While provisions are in place for generation-funded augmentation to the network to remove these network constraints, the generator which funds them has no assurance that they will benefit from their investment.
- Instead, the behaviour of existing generators or the entry of a new generator may reinstate the original network constraints.

- **D. Barriers prevent exploiting economies of scale in connection assets for new generators**
- The regulatory framework is better suited to incremental investment in energy infrastructure rather than delivering more strategic investments such as the coordinated connection of multiple generators in Renewable Energy Zones (REZ).
- Being able to exploit economies of scale in connection assets would mean lower connection costs overall, potentially more low-cost and low-emissions generators being able to connect.
- The regulatory framework typically requires new generation to lead network expansion, creating a ‘chicken and egg’ dilemma. New generation projects cannot be committed without transmission access, yet under the current framework it is difficult to justify the necessary transmission investment without committed generation.

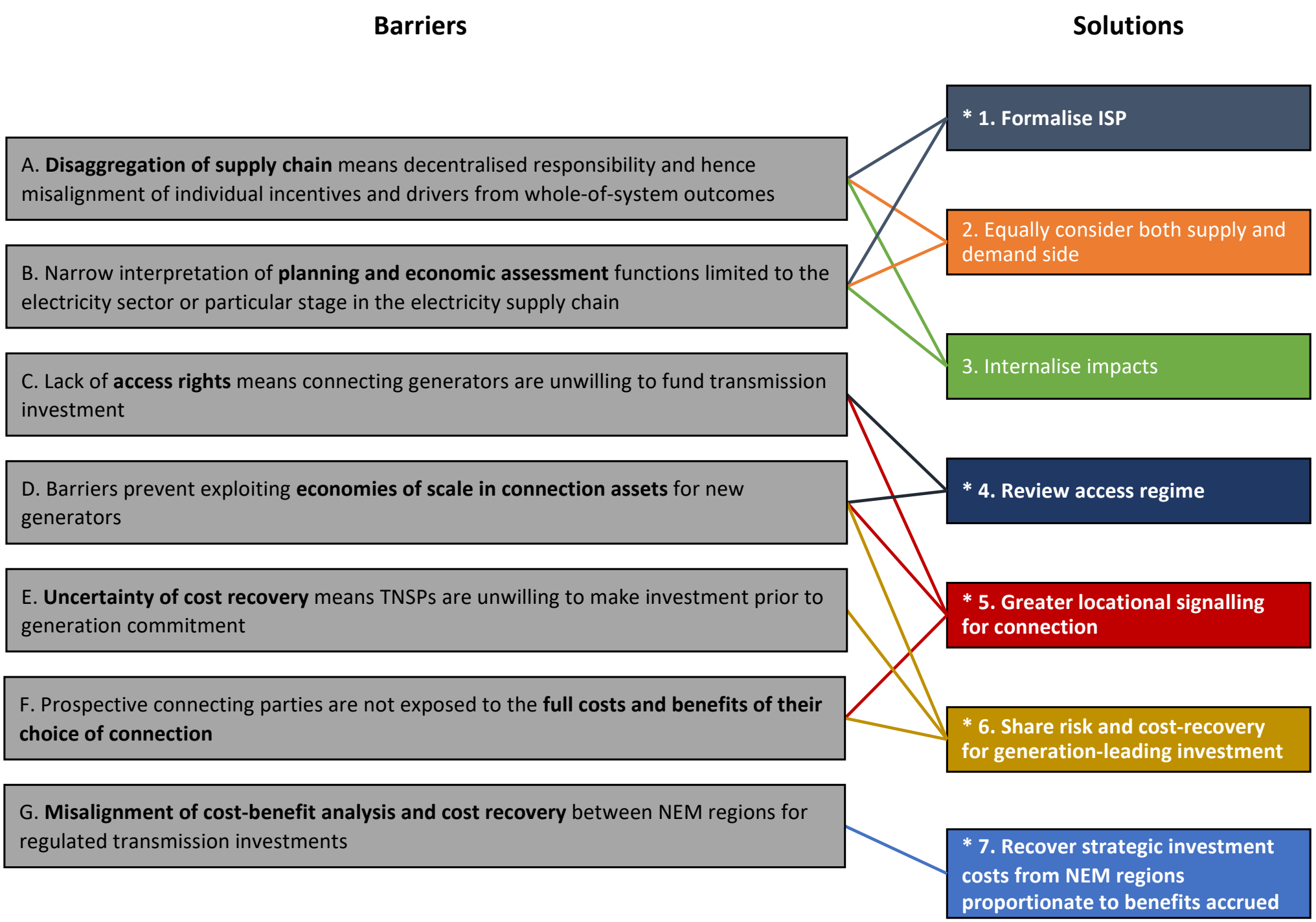
- **E. Uncertainty of cost recovery means TNSP unwilling to make investment prior to generation commitment**
- As noted above, there exists a ‘chicken and egg’ dilemma for transmission investments for multiple expected generator connections.
  - Generation cannot commit without transmission access, yet under the current framework it is difficult to justify the necessary transmission investment without committed generation.
- This is especially problematic where a number of new generators are expected to be connected in a single area and the most efficient solution would be to create a single, larger transmission infrastructure to be shared between multiple generators.
- However, it is unlikely these generators would all connect at the same time or in a coordinated fashion.

- **F. Prospective connecting parties not exposed to full costs and benefits of their choice of connection**
- Currently, generators are only explicitly exposed to some of these, namely: their shallow connection costs and the costs associated with providing any required system strength services as a result of the connection.
- Connecting parties are not exposed to other impacts they may have on the broader network such as any deeper network costs they impose on the TNSP.
- The MLF is calculated for each connection point in the transmission network and not apportioned according to a causer-pays principle. Therefor there is limited incentive (or signal) for connecting parties to reduce their impact on the MLF of other participants.
- Exposing the connecting to their impact on local system strength is a new addition to the regulatory framework following the Managing Power System Fault Levels rule change concluded in 2017.

- **G. Misalignment of cost-benefit analysis and cost recovery**
- The current investment efficiency tests are insensitive to where in the NEM these costs or benefits occur – it only considers the total costs and total expected benefits across all consumers throughout the NEM.
- This is in contrast to the way these costs are actually recovered through network prices which are primarily based on where the expenditure occurred.
- This means that one set of consumers may be paying for the benefits received by a different set of consumers.
  - Further, if the misalignment is large, a particular project may actually have a negative net economic benefit (i.e. an overall detriment) for consumers in one network's jurisdiction despite being positive NEM-wide.
- There are mechanisms in place to apply network costs across network jurisdictions. However, we consider the effectiveness of these in certain cases to be very limited.

Some solutions

1. Formalising the ISP within the Rules with thorough public consultation
2. Equally consider both supply- and demand-side solutions
3. Internalising impacts such as climate change in interpreting the NEO
4. Review access regime for generator connections
5. Introduce greater locational signalling for connecting generators
6. Share risk and cost recovery for generation-leading investment
7. Recover strategic investment costs from NEM regions proportionate to the benefits accrued


Barriers
Solutions
A. Disaggregation of supply chain means decentralised responsibility and hence misalignment of individual incentives and drivers from whole-of-system outcomes
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* 1. Formalise ISP
2. Equally consider both supply and demand side
3. Internalise impacts
* 4. Review access regime
* 5. Greater locational signalling for connection
* 6. Share risk and cost-recovery for generation-leading investment
* 7. Recover strategic investment costs from NEM regions proportionate to benefits accrued

What are our next steps?

- Problem definition?
- Objectives?
- Barriers?
- Solutions?

Relevant reforms underway

- AEMC's COGATI review
  - TWG meetings underway
  - Directions paper on access this Thursday
  - Public forum 8 July in Melbourne
- ESB's actioning the ISP
  - Sub was due last week
- AEMO's development of ISP
  - Scenarios and assumptions report soon
  - AEMO to consult on modelling methodology, need identification, solution testing
- Various others