



Market Sounding Report on Transmission

**Prepared for the Clean Energy Council
and Energy Networks Australia**

3 August 2022

Final Report

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Introduction

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There is a desperate need to solve the transmission challenges in the NEM to unlock the energy transition in Australia.

Anonymous Energy Market Senior Executive

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A new approach to transmission investment is urgently required

AEMO's 2022 draft Integrated System Plan identifies an additional 10,000km of transmission lines required to support 120 GW of large-scale renewable energy and storage on the national interconnected energy system.

KPMG interviewed a number of stakeholders about the challenges to the rollout of transmission needed, as well as their views on pathways available to speed the transition and achieve better outcomes for customers.

The key message raised by the interviews: transmission investment in Australia is slow and highly regulated – and this creates physical, commercial, regulatory and financial risks that inhibit transmission progress.

This report summarises what we heard.....

Current barriers



Social licence through community support is challenging – but difficult to fully address under the regulatory framework



Development and regulatory risks through lengthy processes creates uncertainty and delays for both generators and networks



Achieving sufficient financing to fund uptake in projects could be difficult given cash flows and cost risk exposure under the regulatory framework

Pathways identified



Provide concessional funding to assist in development risk, better facilitate community buy-in, and help affordability



Improve cooperation between regulatory agencies, streamline the approval process for new transmission and achieve better risk management



Recognise that any additional network is under pressure not to add further costs to customers

Potential roles for funding



Development and construction of projects including partial investments in equity



Government builds asset and then sells them to transmission investor(s)



Bridging loan conditional on regulatory approval at early stages of construction



Grants to community

KPMG's role

KPMG was engaged by Energy Networks Australia and the Clean Energy Council to engage with senior representatives across the energy sector to hear their views on the barriers to transmission investment and the potential path forward. This report summarises what we heard.

Role of KPMG

This report summarises the key items of discussion from the stakeholders based on the approach detailed on slide 6 including the views expressed by the stakeholders on the key issues, pathways, and the impact scenarios questions.

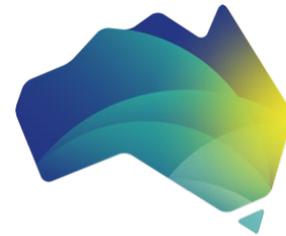
KPMG was engaged to facilitate the discussions with the stakeholders by:

- Developing the questions to pose to stakeholders.
- Facilitating engagement during the stakeholders' interviews to enable contribution from all participants.
- Documenting the results of the interviews and summarising the key responses to the questions.

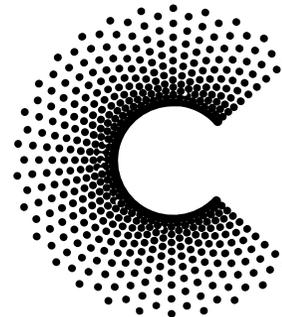
An initial number of sector representatives were interviewed and therefore this report may not capture every stakeholder view on the issues.

Important

This report does not represent the views of ENA/CEC or their members, nor the views of KPMG and its employees. This reports presents the views of a select group of anonymous stakeholders to support informing a constructive conversation with consumers and government on the transmission challenges and as well as some of the pathways for consideration.



Energy
Networks
Australia

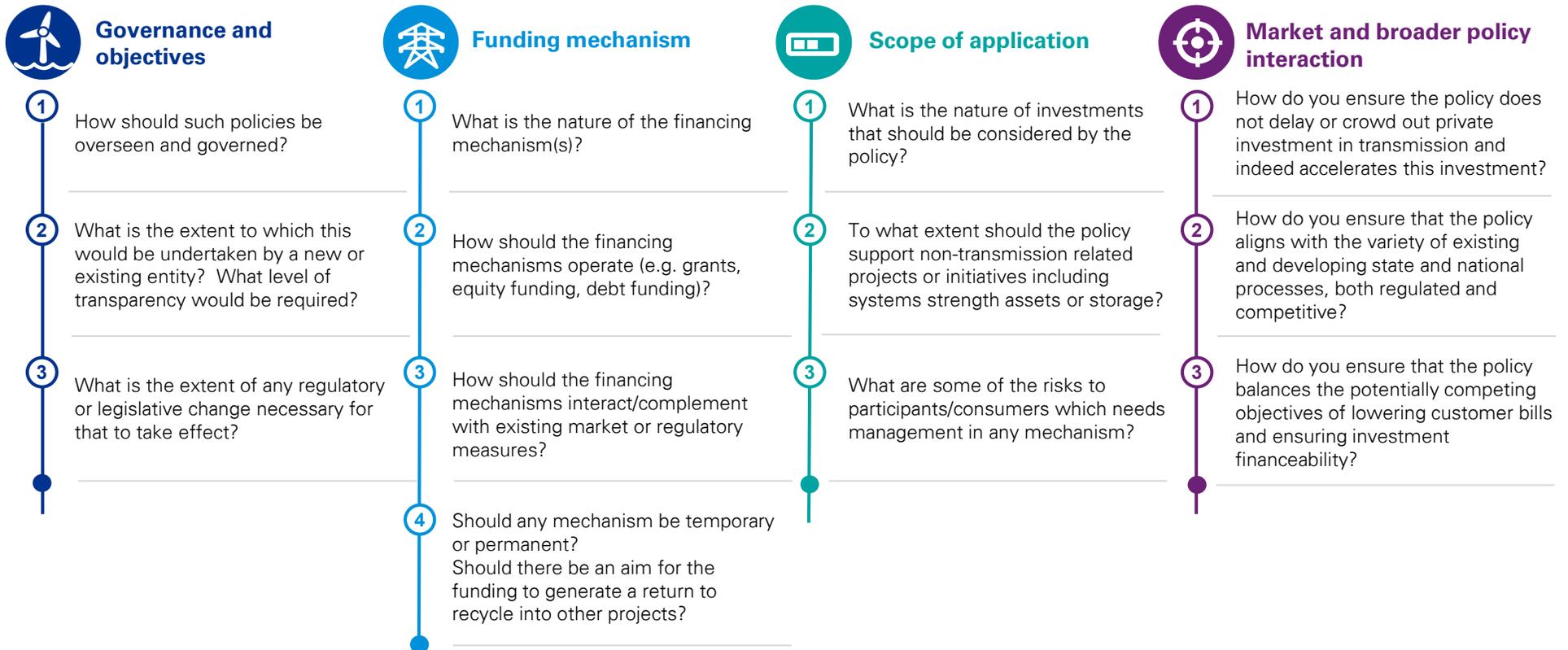


**CLEAN
ENERGY
COUNCIL**

KPMG's stakeholder engagement approach

KPMG interviewed stakeholders across the energy market, including participants across transmission network service providers, regulators, policymakers, operators, developers, contractors, and investors.

Our interviews focused on defining the transmission problem and extrapolating pathway solutions that address the current set of challenges. We then step through a series of questions on potential mechanisms to address the challenges as shown below. Discussions were held with senior executives in most instances, lasting up to 60 minutes, with the identity of the interviewer and their entity protected as anonymous to encourage frank discussion and preserve the clarity of the message. The stakeholders provided qualitative responses as well as three quantitative responses to rank issues, common pathways, and impact on certain scenarios.



Executive summary

The challenge

The Australian market is targeting 120GW¹ of renewable generation with at least 45GW¹ of storage to support the energy transition. Australia's ability to ensure a smooth transition is reliant on a capable transmission network providing certainty on access for generators. The current network is increasingly congested with the sector facing challenges to introduce the necessary transmission at the pace required. Nonetheless, the majority of new generation is expected to be located remotely away from cities, requiring a growth in the transmission network.

The project

The ENA and CEC have appointed KPMG to engage on a transmission market engagement process to inform conversations with consumers and governments on the key issues and pathways forward for the sector. We held anonymous conversations with senior executives across regulators, policymakers, network service providers, developers and private investors on the issues with transmission investment. This report is based on their feedback, and may reflect their area of specialisation or perspective. It does not reflect the opinion of ENA, CEC, their members, nor the opinion of KPMG.

What we heard

While respondents commented that there are multiple factors inhibiting transmission progress, there was a unanimous view on some of the key barriers (Figure 1). These reflect concerns related to:

- a) Social licence and community support are critical to successful transmission projects – but difficult to properly fund and foster under current frameworks. Building complex and longer lines may address some community concerns, but will not achieve funding approval.
- b) Processes for development and regulatory approvals are too lengthy creating uncertainty.
- c) How risks are shared between networks, developers and customers over the asset lifetime is not optimal.

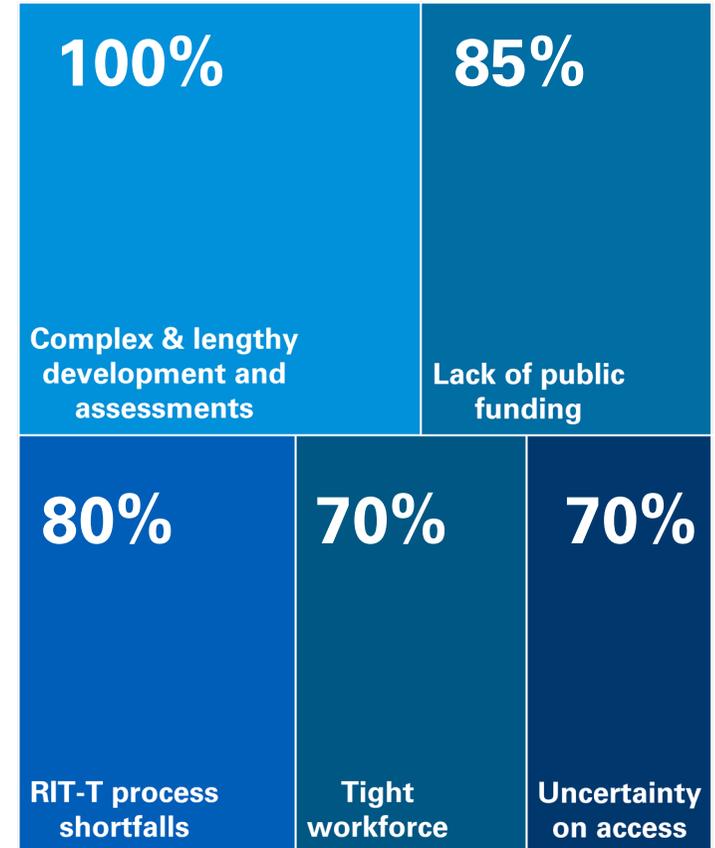


Figure 1: Key issues raised by stakeholders*

Notes:

* Percentage proportion of respondents identifying key issues

¹ AEMO ISP Draft 2022

Executive summary (cont'd)

What we heard – the pathways forward

Respondents recognised the interplay of regulatory, market, customer, and funding factors which combine to create investment challenges in the required timeframes. Unresolved, these challenges will impede Australia’s energy transition.

Many of the issues and pathways are intertwined, and the stakeholders showed clear support for: **provision of concessional funding to assist in development risk, better facilitate social licence and community buy-in, and fund a proportion of the transmission build costs to help affordability** (Figure 2).

Respondents recognised that the role and value of government involvement should be complemented by on-going reforms in these areas. Government financing may not resolve all the issues identified as the current misalignment between transmission and generation planning is a complex and critical issue. However, **funding will be complemented by on-going reforms**.

With electricity grids in the NEM largely organised along state boundaries, it is important to highlight that the pathways identified must be localised uniquely for each state. Many of the states have taken steps to address the challenges in transmission infrastructure investment and have begun the process of enabling new approaches to regulation, funding, and deployment to meet the transmission gap. Similarly, federal bodies such as the Clean Energy Finance Corporation (CEFC) have innovated solutions to support particular challenges. The respondents were clear that the challenges in transmission investment will increase if the sector does not move quickly. They also consider that **current arrangements and organisational responsibilities are adequate to facilitate concession funding**.

Most stakeholders agreed that the current state of transmission is untenable and agreed that if the sector is left unchanged, significant intervention would be urgently required (Figure 3). Stakeholders also showed awareness of the cost consequences of increased investment. With increasing wholesale electricity prices being seen across all states, some stakeholders expressed the view that networks are under increased pressure not to add further cost to customers.

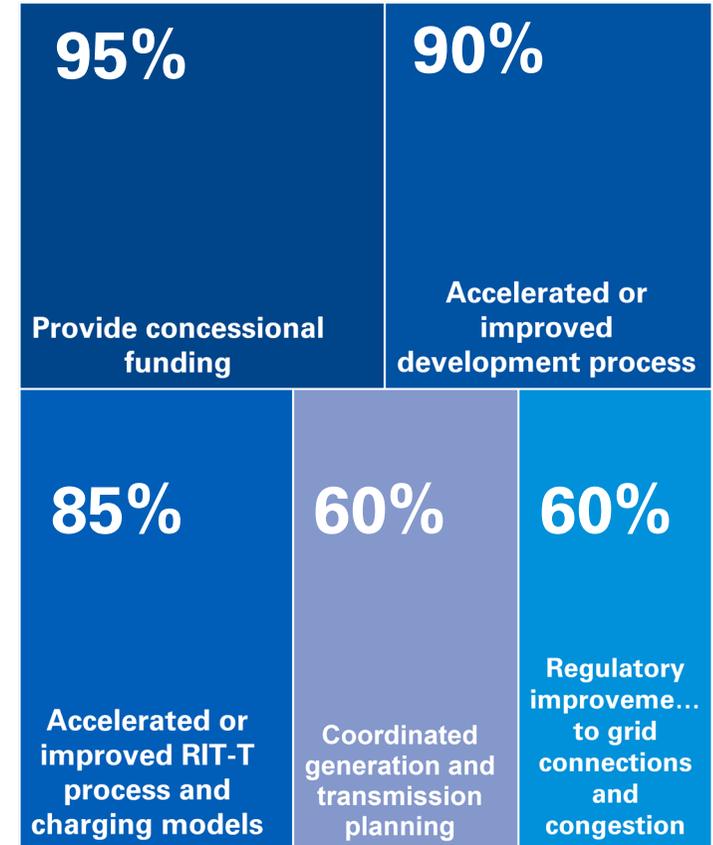


Figure 2 : Key pathways raised by stakeholders

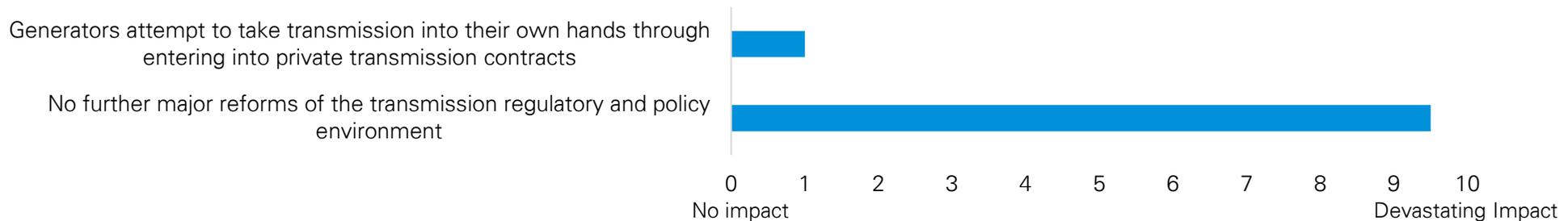
Notes:

* Percentage proportion of respondents identifying pathways

Insights from stakeholders

Stakeholders highlighted the need for change. There was broad recognition that a failure to reform the status quo will have a devastating impact on transmission investment levels.

Stakeholders were asked about the following approaches



Stakeholders were asked to rate the effectiveness of the following approaches

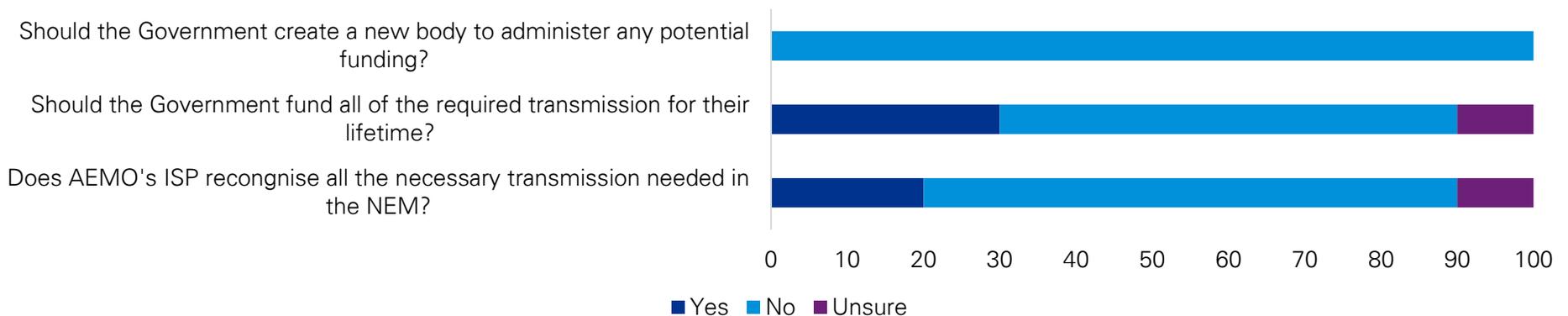


Figure 3 : Stakeholders insights



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Background

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The ISP is a great document, but it doesn't give us a full picture of all the transmission needs of the NEM.

Anonymous Energy Market Senior Executive

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No energy transition without transmission

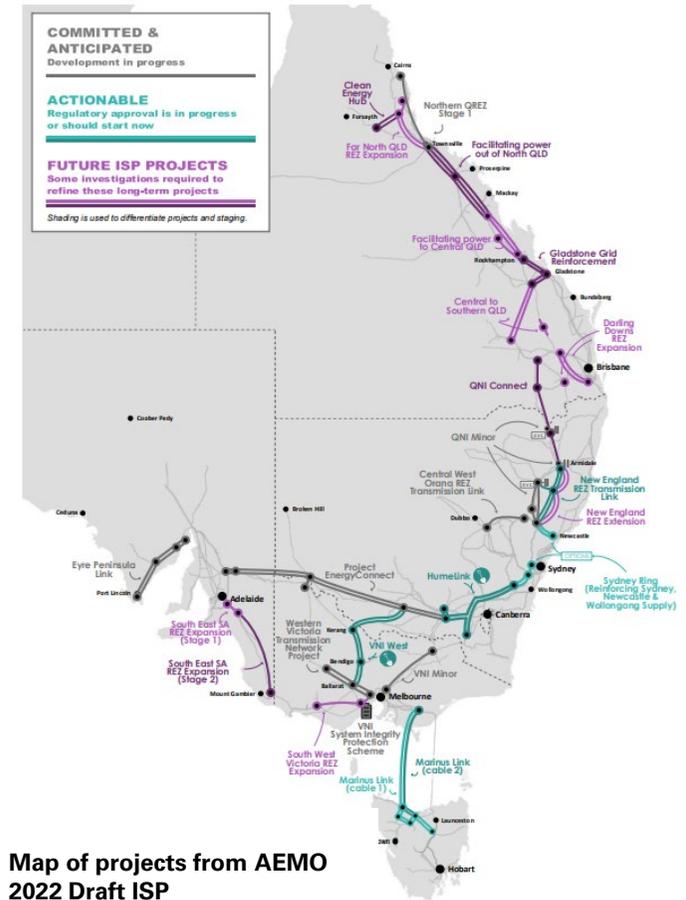
Transmission infrastructure is critical to enable Australia's transition to renewable energy – while ensuring secure, reliable, affordable, and sustainable energy for consumers.

New generation relies on increased capacity

- The high voltage transmission system of the interconnected national electricity system links together generators (in remote locations with high irradiation or wind resources) and the customers that require their electricity.
- The transmission network also links together the different regions allowing electricity to flow between states. The transition from historical thermal generation to new technologies such as wind and solar are changing where power is needed.
- Without the required transmission investment, new generators will not be able to connect as existing generators exit the market.

At least 10,000km voltage of high transmission required

- The draft 2022 Integrated System Plan (ISP) published by AEMO sets out a development path for the transition to a low carbon future. As shown to the right, AEMO considers that 10,000 km of new transmission infrastructure could be required to support the needs of the transition of the future energy system. Various sources suggest that investment in the range of \$20-40bn is needed in transmission.
- The draft optimal development plan is based on the need for the National Electricity Market (NEM) to supply nearly double the current customer demand by 2050. In addition, this increase in demand has to be managed alongside the transition of supply from largely coal fired generation to a renewable energy based system.
- According to AEMO, the transmission projects within the Draft optimal development path are forecast to deliver scenario-weighted net market benefits of \$29 billion, returning 2.5 times its investment.¹
- **The AEMO ISP assumes 14GW out of the 23GW of coal capacity will withdraw by 2030, but the exit of thermal generators may be faster due to commercial and environmental pressures.**



Map of projects from AEMO 2022 Draft ISP



3

Transmission key challenges

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Many of the challenges in transmission emanate from policymakers suffering the bruises from the gold plating era of the year 2000's, wishing to protect consumers from network price rises. However, the reality is that inaction in transmission is going to send overall energy prices soaring...

Anonymous Energy Market Senior Executive

”

Summary of key issues raised by stakeholders with transmission

Stakeholders identified a number of issues in the transmission sector, with the following 5 issues dominating the views of those interviewed.



1 Complex and lengthy development and assessment

Overview: There was overwhelming consensus that the development and assessment of transmission lines as well as the connection process to transmission were both complex and lengthy.

Key themes : Social licence, planning approvals, land rights, community engagement.



2 RIT-T process shortfalls

Overview: Almost all stakeholders believed that the RIT-T process did not include all the relevant economic benefits. Furthermore, cost-recovery from consumers doesn't reflect the distribution of benefits.

Key themes: Additional benefits, charging models evolution, cost of carbon, construction premium



3 Lack of public funding

Overview: Almost all stakeholders recognised the need for government concessional funding to support development and construction of new transmission corridors.

Key themes: Affordability, financing, development and construction risk, private investment at COD.



4 Tight work force & supply chain

Overview: The tight labour market presents issues in supply chain. A key concern observed by various stakeholders included the availability of organisations with capabilities to deploy at scale and co-ordination across all NEM projects.

Key themes: Labour, inflation, supply chain, workforce, organisational capabilities.



5 Uncertainty of access

Overview: A number of stakeholders identified the complexity of operational access on transmission lines leading to congestion and uncertainty for generation developers.

Key Theme: Grid connection, congestion, marginal losses, transmission constraints.

Lengthy development and assessment timeframes

Once a transmission project is identified, there are a number of approval steps required before it can be built, including grid design planning permits, and acquisition of land. The combination of these steps can mean it is years between identification and construction of a transmission project.



Lengthy regulation and planning process

Many stakeholders raised concern about the **timelines to turn a transmission concept into a delivered project**.

Repeatedly, the example of Project Energy Connect linking SA and NSW was raised. **This project has been under active consideration for over seven years**, through regulatory and planning approval processes. Stakeholders noted the approval steps for new transmission investment are lengthy, and often quite circular.

It was noted the following approval steps are required for new transmission investment:

1. AEMO's ISP process identifies the optimal development path across the National NEM.
2. The Regulatory Investment Test is required for economic approval of the project for the network.
3. Opportunity to apply for a Contingent Project Assessment.
4. Jurisdictional environmental and planning approvals.



Transmission is fraught with social license challenges

A repeated theme of our discussions was that **engagement with local communities** has been difficult under the current regime. One stakeholder commented that of all infrastructure, high-voltage transmission is the hardest to justify to local communities who often consider that the benefits are remote.

Stakeholders noted that the existing processes for easements rely on compulsory acquisition, and that transmission companies are restricted on how much they can pay landholders. This compares to generation developers who pay large sums for access to land for development. In addition, easement payments are generally one off, while generation payments are often continuous over the life of assets. The rigidity of the process is leading to communities feeling frozen out of decisions, with little ability to shape or influence the outcomes.

Regulatory test does not address all benefits

Before transmission projects can be built, the network must complete an economic cost benefit analysis known as the Regulatory Investment Test for Transmission (RIT-T). Most respondents raised concerns that the structure of the test is impeding the needed transmission investment.

Incremental nature of test

Respondents are clear that the system **requires coordinated strategic development** to allow for the timely transition to renewable generation. The historical role of the investment test is to ensure efficient decisions are made in **incremental developments** of the transmission network.

We received feedback that the expected electricity price impacts of improvements to the wholesale market by transmission development are not properly captured by the current test.

The current test focusses on the market benefit, which is the improved wholesale market of a single project. However, this does not assess the value of multiple projects together, or their impact in a transitioning market.

Almost all stakeholders acknowledged the **time gap risk** born by customers, whereby approved RIT-T **projects are funded by the public before the benefits are realised** by consumers. This is in addition to the risks borne by the transmission company that does not receive project funding until a project is approved.



Narrowness of benefits considered

A number of stakeholders were concerned that regulation decisions on choosing to build transmission **do not account for the full benefits** that transmission projects bring to the community.

Commentators raised **carbon emission reduction** (or price of carbon abatement benefits for transmitting clean generation), **construction risks, regional development opportunities, and job growth** as areas that are not fully considered by the regulatory test. The omission of these factors could skew decisions, including resulting in socially beneficial projects being withheld.

However, we received some feedback that electricity consumers should not be asked to fund transmission choices made for reasons outside of their direct benefit. Some interviewees suggested that **Government could have a role bridging the gap between the consumer and the social value of transmission.**



"The RIT-T is not fit for purpose. It puts on consumers the value of investment while focussing on costs that need to be paid upfront"



Lack of public funding sources

There is currently minimal organised public funding available to coordinate transmission benefits. Additionally, there is limited avenue for private investors to enter into transmission investments outside of the existing networks.

Government provide limited support for project funding



The status quo for electricity transmission relies on transmission companies raising capital for projects after they have gone through a lengthy regulatory process to minimise risk for consumers.

In many interviews the process of funding electricity transmission was compared unfavourably to the process in place for other nationally significant infrastructure such as roads and highways.

For highways, the federal government provides support to nationally significant projects, which are also developed by the state governments in partnership with private capital.

Stakeholders stated that there appeared to be **minimal cooperation between the plans of the separate jurisdictions** and the market regulatory bodies. In fact, some stakeholders were concerned that these bodies may not be even talking to one another.

This reflected a repeated opinion that the Federal Government has not been taking on a proactive role in electricity transmission, that reflects the **importance of the electricity transition in the future of national development**.

Investment from outside the networks faces barriers



Stakeholders consider that **private funding** outside of the regulatory process may be an avenue for generators, or groups of generators to build new transmission to meet their obligations.

However, this is not occurring due to practical and regulatory issues impeding in the ability for generators or other parties to develop networks for their needs outside of the existing framework.

Generators are reliant on the transmission investment that occurs from the regulated process, with minimal ability to speed up the process.

Stakeholders raised a repeated frustration that rising wholesale prices provide a market signal for more dispatchable generation, but the generators cannot spur action in transmission to allow them to connect.

“Neoliberalism has meant that electrical infrastructure is not treated in the same way as transport infrastructure. Networks (many privatised) are left holding the can to develop increasing complex and riskier projects on balance sheet. It would never happen on a road or rail project, so why energy?”



Tight labour market and supply chain issues

Difficulties in sourcing labour and inflation of prices have led to significant challenges to the deployment of transmission.

Tight labour market



Transmission projects rely on a small pool of highly trained engineers and other specialists including limitations in the number of qualifying organisations. As Australia constructs more transmission projects to meet the needs of the system, the availability of these workers becomes more limited.

Stakeholders raised a risk that an inability to source required staff may impede timely transmission construction.

One particular issue raised was that the construction of the required major transmission projects should be staggered over the next decade so as to not stretch the resource pool.

However, projects are taking so long to commence that we could reach a stage where multiple projects will need to be built simultaneously across the country as a matter of urgency. If this occurs, the projects will compete with one another for resources, and drive up the prices for consumers.

Supply chain price shocks



Stakeholders raised the increasing pressure of inflation and recent price hikes across all supply chain as an area of concern.

They observed that supply chain pressure is resulting in up to 40% increases in capital expenditure and at least a 5% increases in operational expenditure for major projects. Cost increases are occurring across labour, fuel, logistics, steel, cement, copper, aluminium, and other key commodities.

A number of stakeholders believed the **increase in project costs may cause damaging delays** and in some cases indefinite postponement of transmission corridors, exacerbating the pressure on networks and limiting new generation connecting to the NEM.

“Sustained pressure on labour and skill shortages, coupled with significant capex increases pushes for focused alignment for the industry to work together and smarter to negate the market pressures”



Transmission constraints and generator lack of access

Generators face a risk that once connected they may be curtailed and unable to export due to the situation in the transmission network. There is minimal ability for generators to signal to transmission where it should be built to maximise value.

Generation connection delays impeding renewables transition



Stakeholders observed that the grid connection process for new generation during construction are the longest in developed economies globally. Most generators required at least two to three years to receive a connection agreement.

This connection delay is further exacerbated by post-construction requirements that can lead to an additional two years to enable projects to fully dispatch.

The complexity of process, lack of transparency of requirements, broad discretionary powers, uncapped timeframes, and undefined access standards lead to **generators facing connection risks**.

Tight transmission capacity



The NEM operates under an “open access regime” where any generator can connect at any point. However, once connected, generators may not be able to export due to constraints on the power system.

Stakeholders raised the risk that if the network situation changes (possibly because another generator connects nearby) a **generator may find itself uneconomic soon after construction**.

There are minimal avenues for a generator to invest in transmission for itself to ensure it can export when wanted. Additionally, generators can't signal to transmission companies where transmission will be most valued.

A mechanism for generators to “put their money where their mouth is” could provide information for efficient investment decisions by the transmission network to invest where needed.

“As individuals, we wouldn't accept that a neighbour can build a driveway that would stop us getting to our house. Why do we accept that for electricity transmission lines limiting generators?”



The voice of consumers

The overall impact of transmission build on consumers needs to be considered as the central element of any policy response. Consumers are ultimately responsible for funding transmission build, but are likely to see reductions in overall costs due to improved wholesale market outcomes.

Impact on consumers

From the prospective of consumers there are a number of concerns including:

1. Transmission investment that leads to higher network tariffs at a time when wholesale electricity price is sharply on the rise will be a significant challenge.
2. Stakeholders also recognised that policy makers and market participants are conscious of any investment in networks that give rise to the widely criticised policies in the 2000's involving perceived network gold plating.

Given the current framework, where transmission investments are ultimately funded by consumers, large projects play a big role in impacting customers' bills.

Stakeholders were sensitive to the reality that consumers expect an overall market benefit for expenditure on transmission.



Challenge of consumer costs is the elephant in the room

Delays in transmission development are driving up prices and placing long term reliability at risk.

Numerous stakeholders considered that consumers are already bearing costs of transmission delays, and that this will continue to potentially worsen over time. The concern is that new entrants, and interconnections are being delayed, which drives up costs and increases the potential for supply not being available when needed.

Cost recovery between different consumer categories can be smoothed with funding

Transmission is ultimately funded by consumers who face risks when new large transmission projects are specified.

- Consumers begin paying as soon as a project is approved, but the benefits from the project may accrue years in the future once generators connect.
- Consumers in one jurisdiction may pay for the capital costs for a project, but the market benefits are spread across multiple regions.

Government grants could reduce the overhead of transmission costs and reflect the distribution of benefits between the future, inter-state consumers and wider society.

Other challenges raised

Some stakeholders raised the below additional issues that could be impeding transmission build.



Business case architecture

Networks receive a regulated return for their assets that is determined by the Australian Energy Regulator following a process determined by the National Electricity Rules.

Some businesses consider that this framework impedes the ability of the networks to access the capital needed for large capital projects. Two related concerns were raised with us:

1. Resource intensive and expensive planning works are not fully captured by the regulatory process. Networks have to take a risk developing projects that aren't covered by the regulatory regime.
2. The revenue raised may not match the expectations of return held by institutional investors for large projects. This may mean that these projects cannot be funded.



Unsuitable cashflow sculpting

RIT-T approved projects derive a fixed cashflow for the 20 year term based on benefits examined at the time of the approval. A number of stakeholders observed this is problematic where the benefits change over time due to energy transition shifts and consumer behaviour evolving over the long term payment profiles.

Lack of coordinated transmission planning

Whilst the AEMO ISP details a number of major corridors between states, there are still a number of significant transmission corridors that are not agreed and depend on each state's unique transmission challenge needs.

According to the stakeholders, coordination between the states' network planning is required to ensure the right transmission solutions are applied to locational needs.



Private sector investment barriers

Historically, transmission has been taken as a regional monopoly service providing a linkage from centralised thermal generation to consumers.

The transition to renewable energy is also a transition to more diverse set of generation spread over large regions. We received feedback that the historical template may not be agile enough to meet the needs of generation investors or consumers.

While mechanisms exist for transmission contestability, or investment outside of the existing regional networks, it is still practically difficult for these investments to occur.

A few stakeholders suggested the WACC was too low for the depth of development and construction risk born by green developments projects, and that the current WACC is more reflective of already constructed projects rather than projects that are yet to be built.



4

Pathways for transmission success

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The market has been dabbling with complex mechanisms, many don't go to the issues we currently have. What is important is that we resolve the transmission challenges by focusing on the gaps in the process day, rather than add regulatory risk and overhaul the process. Any changes must be carefully considered – be careful what we wish for.

Anonymous Energy Market Senior Executive ”

Summary of key pathways explored

Five pathways were identified by stakeholders regarding transmission development in the NEM. All were considered as playing a role in supporting increasing affordability challenges for customers.

Key pathways



A Accelerated or improved development process

Overview: Stakeholders supported the need to streamline the process of getting infrastructure built. The main area of focus included working with local communities.

Issue addressed

1 4 9

Key Issues

1 Complex & lengthy development and assessments



B Provide concessional funding

Overview: Respondents considered that the Federal Government has an important role providing funding and coordination for the transmission projects that could drive the energy transition during the development and construction phases.

3 6 7 8

2 RIT-T process shortfalls



C Accelerated or improved RIT-T

Overview: Stakeholders proposed methods of speeding up the economic approval processes, including questioning the need for all the regulatory approval steps in the context of nationally significant projects.

2 6 7 9

3 Lack of public funding

4 Tight workforce



D Coordinated transmission planning

Overview: Stakeholders were supportive of a process that is inclusive of each of the states' unique requirements.

4 5 7 9

5 Uncertainty on access

6 Missing benefits being captured



E Generator certainty: grid connection & regulatory improvement to congestion

Overview: Some stakeholders believed a carefully crafted mechanism that deals with grid connections and congestion would ease the pressure of lengthy connection times and curtailments as well as support issues related to uncertainty of grid access.

5 7 9

7 Lack of coordinated & central planning

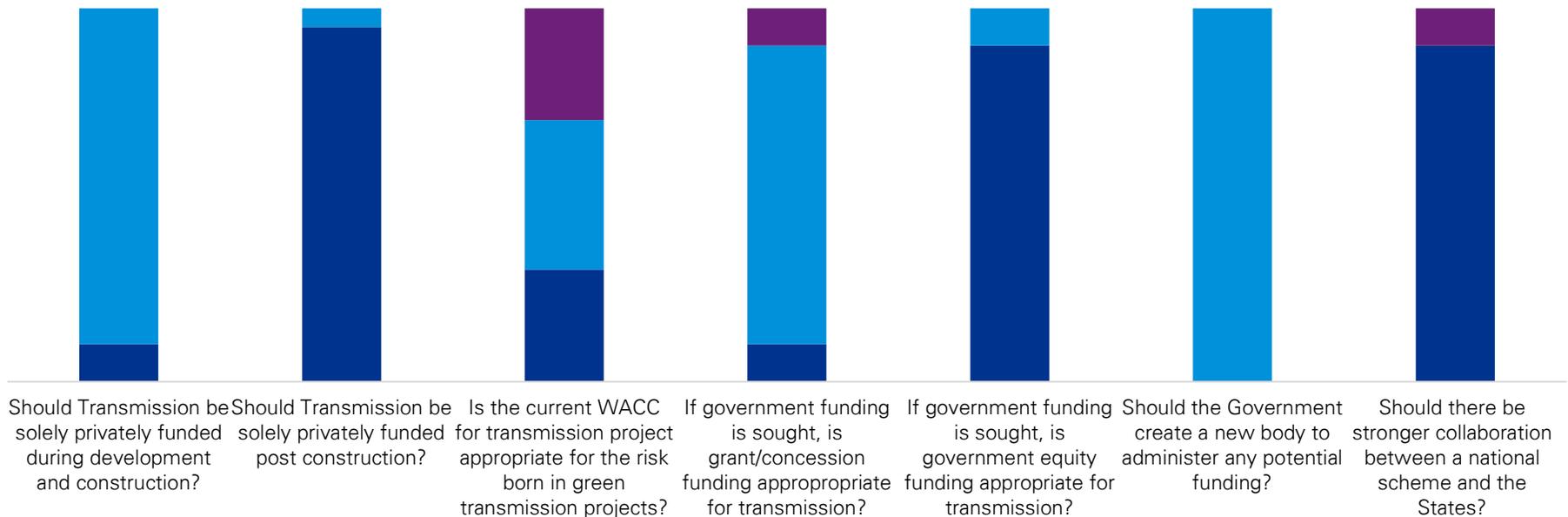
8 Unsuitable cashflow sculpting

9 Private sector investment barriers

Stakeholder insights

A number of key pathways were identified by stakeholders regarding transmission development in the NEM.

Figure 4 : Stakeholder insights



We note that some of the senior executives may not have been experts in all areas relating to WACC implications. This requires further consultation and exploration.

■ Yes ■ No ■ Unsure

Stakeholder insights (cont'd)

A number of key pathways were identified by stakeholders regarding transmission development in the NEM.

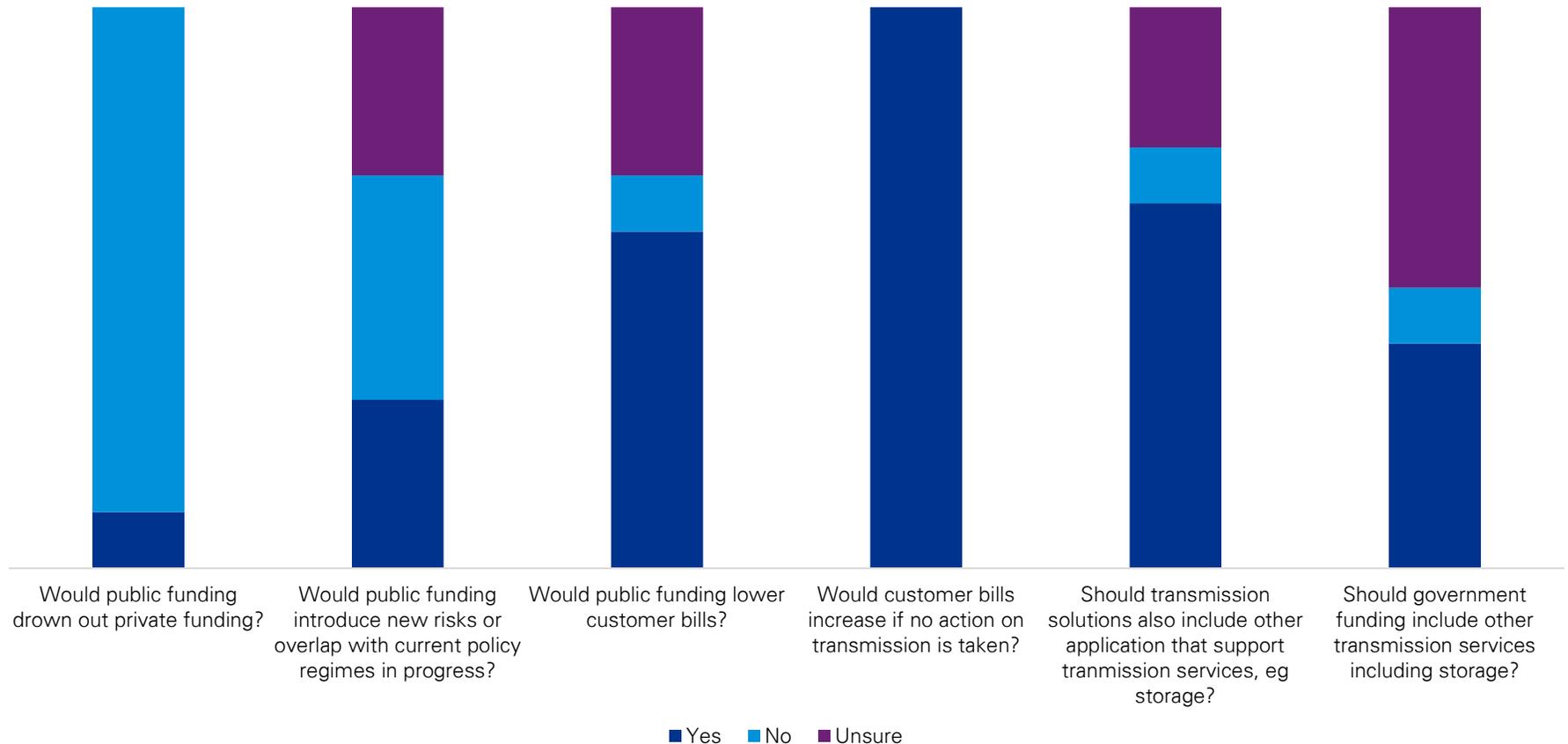


Figure 5 : Stakeholder insights

Accelerated and improved approval process

A top priority raised was the need to streamline the process of getting infrastructure built. Two areas of focus include working with local communities and improving the connection regime for new generators.

Community engagement and planning regimes



Stakeholders are concerned that the lack of community engagement is slowing down planning approval and development. The respondents consider that barriers are in place that impeded businesses managing community concerns in a timely manner. The same issues are being repeated across the country, wherever transmission development is needed for renewable capacity.

The planning process needs to take into account the impact on local communities as a core element of choosing and defining routes of projects. This requires bringing forward community engagement as a key input in the route selection and planning.

In response, some respondents consider that **funding could be used directly to support compensation** for affected landowners, or for providing support for wider local communities alongside transmission development. This may provide for a more cooperative relationship with regions impacted by transmission development. Other stakeholders suggested that social license initiatives can be done in advance with local communities, where they could have “ownership” of some ongoing revenues from the transmission projects that effect their region.

Coupled with a more cooperative interaction, **more flexibility** could be introduced into the jurisdictional planning regime to allow for communities to feel that they have more say in the transmission process.

Intertwined processes for acceleration and improvement



Supporting local communities and landholders

The payment for easements is a strict legal process based on the jurisdictional obligations of compulsory acquisition. Stakeholders consider that this undervalues the impact on landholders, the environment and communities causing resentment and delays. However, additional payments from the networks would have to come from the consumers, and raise consumer bills.

The Federal Government could help facilitate community support by supplementing the easement payments to landholders and effected members of the community. One stakeholder suggested that the Federal Government provide additional health and education facilities in regions hosting large amounts of transmission development.

Coordinating community engagement

The current planning process outlines a broad route for development, which is fleshed out by the network to determine a specific route to meet the need of the energy system. Communities are often not part of the preliminary stages of the process, and are only often involved after a decision is largely made. The Federal government should help facilitate communication between networks, AEMO, jurisdictional governments, local governments and communities to help determine how the process can be improved to take into account local voices and knowledge.

“Network developers must win the social licence to proceed with transmission speed, this requires us to better listen and work with communities”



Providing concessional funding

Respondents considered that the Federal Government has an important role providing funding and coordination for the transmission projects that could drive the energy transition.

Taking on transmission development risk



There are a number of risks the transmission companies face that could impede development of timely infrastructure:

- Preliminary work such as route selection occur before regulatory approval. Costs may be incurred before regulatory approval. If approval doesn't occur, the transmission company has lost money.
- Once an asset is built, the preferred market outcomes may not occur (e.g. generators may not connect when expected, which results in costs to consumers).
- Assets could be transmission lines or virtual transmission lines that support providing transmission services.

Stakeholders provided models that the **Federal Government can use funding to incentivise new development** by taking on these risks for transmission companies.

- The Government provides low interest loans or grants that help the networks manage their finance during the initial and preliminary stages of the projects.
- The Government directly funds and builds individual projects. This demonstrates value once generators connect, so networks are able to integrate the costs into their regulatory regime. This demonstrates an efficient way for the operator to recover costs.

Taking on costs on behalf of consumers



Transmission developments can lead to a nationally improved market outcome, but the **costs may be borne by different categories of customers**. For example, consumers in the state where a project occurs start paying once it is constructed, but the benefits can accrue inter-state and into the future.

Federal funding can be used to alleviate this imbalance on consumers, coupled with reform of cost recovery. Government capital can be used to provide **direct grants** to large transmission projects. While applied, to the transmission company, this would reduce consumer payments and directly reduce consumer bills. Stakeholders considered that government seed funding for transmission is likely to streamline the development and regulatory process.

Direct financial support is needed to ensure timely construction of assets needed for generators to be able to connect, provided that the funds do not increase proponents' profit levels. Hence, some respondents considered equity funding is more advantageous than grants.

"Funding into transmission development and construction would fill a gap in the transmission cycle and provide a common mechanism used in transport infrastructure to deal with development and construction barriers and risks. It doesn't need to be a traditional line, it could be virtual transmission in the form of storage to avoid augmentation of transmission"



Funding options suggested in interviews

Respondents considered that the Federal Government has an important role providing funding and coordination for the transmission projects that could drive the energy transition.

Solution	Issue being resolved	Funding option	Stakeholder feedback
 <p>Direct financial support for development & construction of chosen projects</p>	<p>Direct consumer cost of transmission investment</p> <p>Difficulty of raising total amount of capital for large projects</p> <p>Risk that the funding goes to boosting profitability of proponents rather than reducing customer bills</p>	<p>Government directly pays for part of transmission construction, so the transmission network does not need to raise as much capital, and pass total amount onto consumer costs.</p> <p>Whilst the feedback on whether equity versus grant versus debt was preferred is complex, there was clear support for funding mechanisms where the funding does not necessarily go to boosting profitability of service providers. This was a clear view of the majority stakeholders, many of which considered that there are sufficient pools of capital willing to accept the current WACC levels.</p> <p>However, some stakeholders believed there was a misconception that the WACC for brownfield and greenfield transmission should be the same, and this suggested that some stakeholders believe the current WACC doesn't take in consideration development risks.</p>	<p>Strong support for Equity</p> <p>Moderate support for Grant</p>
 <p>Government builds asset then sells to transmission investor</p>	<p>Difficulty of network business raising the required capital</p> <p>Development risk for network of project that is not approved</p>	<p>Government builds the transmission infrastructure taking on development risk, then sells the long term operation and revenue of the asset.</p> <p>Potential to make the sale price lower than the regulated benefit thus reflecting overall community benefits of the asset.</p>	<p>Moderate to Strong</p>

Funding options suggested in interviews (cont'd)

Respondents considered that the Federal Government has an important role providing funding and coordination for the transmission projects that could drive the energy transition.

Solution	Issue being resolved	Funding option	Stakeholder feedback
 <p>Bridging loan conditional on regulatory approval</p>	<p>Transmission company faces risk that expenditure made during preliminary stages of assessment until regulatory approval received will not be recovered</p>	<p>Loan from government to transmission company for preliminary works. If regulatory approval received, this is repaid as part of regulatory returns.</p>	<p>Strong support</p>
 <p>Loan at early stages of construction</p>	<p>Regulated revenue at early stage of investment is too low for investors – it is difficult to front load cost recovery as this places upward pressure on consumer cost</p>	<p>Loan from government to transmission company to top-up investor returns in early years of project. This is then partially or fully recovered as part of regulated revenue.</p>	<p>Strong support</p>
 <p>Grants to community</p>	<p>Lack of social licence may impede the ability to receive planning approval</p>	<p>Government provides payments and additional services to land-owners as well as effected communities.</p>	<p>Moderate support</p>

Accelerated or improved RIT-T process

Stakeholders proposed methods of speeding up the economic approval processes, including questioning the need for all the regulatory approval steps in the context of nationally significant projects identified by the ISP.

Optimal development pathway projects may not need further regulatory approvals

A number of stakeholders questioned why the individual projects specified by the optimal development plan from AEMO's Integrated System Plan need to be examined by a separate RIT-T efficiency test before they can be built.

Recent reforms have allowed transmission projects specified by the ISP to progress through economic regulation in a more timely manner. However, stakeholders consider that this was not enough and suggested that the planning regime still acts as an impediment to timely decision making.

Stakeholders noted that jurisdictions have begun bypassing the RIT-T for strategic projects. Victoria in particular has passed legislation allowing government to fast-track investment decisions after consultation with AEMO.



Realising benefits for community of investment

There was disagreement between stakeholders on the benefits that should be included in the RIT-T when the test is done.

Some considered the test should be broader to reflect net social benefits, while other participants focused on the fact that consumers are responsible for the costs, and should be protected from inefficient expenditure.

Government has two potential roles to play in this space:

1. Review the test to determine the appropriate balance of benefits are included, especially in the context of a changing system and energy market transitions.
2. Consider **using funding to represent the wider community benefits** of specific transmission projects that exceed the market benefits that consumers could be expected to fund.



"These projects are being examined in detail by AEMO as part of the ISP. Why do we need to review them all over again?"



Other helpful pathways

In the interviews, some stakeholders raised the below pathways to improve the provision of transmission for renewable generation. However, these pathways are not considered as important as the other proposals.



Coordinated generation and transmission planning

Stakeholders agreed that there should be some mechanism for incoming generators to be able to signal where they wished to develop. This can provide transmission companies with information that helps show where their investment plans would be of most value.

Some stakeholders raised the possibility that coordination needs financial backing to be effective. They observed that jurisdictional REZs have provided this signalling on a jurisdictional basis.



Connection processes for new generation

Some stakeholders consider that the connection regime for new generation could be the focus of policy making attention.

Specific issues that could be the focus of reform include:

- Inconsistency between the obligations and rules in different states. It was not noted that the jurisdictional REZ regimes are potentially exacerbating this issue.
- Both AEMO and networks are concerned about technical issues and request generators provide detailed technical modelling on their impact.

Generators raised concerns that some of this modelling is overly time consuming and iterative.

Support for the connection reform initiative was well regarded by stakeholders as well as tighter contractual pressures on the NSPs to deliver on time and on budget.



Regulatory improvements to congestion for more valued access

We received feedback that generators would value a mechanism that provided some protection from changes to the grid after they connect. However, there was recognition that this is a difficult policy area of development. There was widespread agreement that it is difficult to balance the needs of a newly connecting generator to one that already exists.

A number of stakeholders while in favour of the concept of improved access, opposed the specific policy options being discussed in the NEM.

Unhelpful pathways

Stakeholders identified that the below pathways would be unhelpful in facilitating the roll-out of new transmission. Notably the respondents were concerned about delays of setting up a new body, and the potential backlash for an educational campaign.



New regulatory body

Stakeholders were unanimous in stating the existing market bodies should be used in the allocation of funding for new transmission projects.

In the interviews, concerns were raised that it would take a number of years to design and set up a new body for providing the funding. Notably, a new body may require legislation before it is able to function.

For the most part, stakeholders considered that the Clean Energy Finance Corporation would be a good fit to the role of supporting transmission investment.



Education campaign

Some stakeholders consider that the government could invest in an education campaign focussed on the benefits to consumers and communities of transmission infrastructure in the context of the wider energy market transition.

However, other respondents were concerned that this is likely to be detrimental if the message appears condescending. Any public engagement should aim to be organic and at a community level rather than a national campaign.

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Relevance to existing pathways

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Urgent action is needed, and there are a number of pathways that are capable of driving a positive change. However, all pathways must pass two critical tests: 1) Does the pathway present value to customers? And 2) – Does the pathway create a subsequent issue for the energy market? Any policy that fails the two tests should be cautionary.

Anonymous Energy Market Senior Executive ”

Relevance to current policy settings

Ongoing reforms to the transmission process are being considered by jurisdictional governments and market bodies. In the interviews stakeholders referenced the below ongoing work programs and their impact on transition reform. Generally, the feedback was that more work is needed, and the reforms proposed are not enough to provide the transmission investment needed in a timely manner.



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Jurisdictional REZs

The state governments of NSW, Queensland and Victoria are all independently examining mechanisms for the creation of Renewable Energy Zones to encourage development in their states.

Stakeholders generally stated that these programs are improving the investment environment for transmission and generation. In particular, the NSW REZ design was praised by numerous stakeholders.

However, a common element of feedback was that the lack of consistency and coordination of these policies was problematic and could lead to inefficient outcomes for Australia as a whole.

ESB – Transmission and Access

Transmission and Access is one of the reform limbs of the NEM 2025 market design being prepared by the Energy Security Board.

While we were conducting the interviews for this report, the ESB published a consultation paper on the proposed access arrangements.

The respondents did not directly comment on this paper, but did provide feedback on the access reform generally.

There was concern that the ESB process has been too slow to provide outcomes. In addition there was fear that could lead to an access arrangement that places costs on generators without providing certainty.

AEMC – Transmission and Planning Review

The AEMC is doing a review of the transmission and planning framework, largely driven by concerns raised by networks of the difficulty of obtaining finance.

The draft report is planned to be published by the end of May, and will likely focus on efforts to provide the networks with the signals to encourage and fund ISP identified projects.

In the longer term, the AEMC and AER are examining arrangements for contestability of transmission projects, which could allow for development to occur in a more competitive manner.

Glossary

Key term	Definition
AEMC	Australian Energy Market Commission The rule maker for the Australian National Electricity Market, Retail Energy Market and Australian Gas Market.
AEMO	Australian Energy Market Operator Responsible for the day-to-day running of the NEM. Also prepares planning documents on future needs of the system including the ISP.
AER	Australian Energy Regulator The regulatory body which enforces the National Electricity Rules, and determines regulated revenue for network businesses.
CEC	Clean Energy Council The Clean Energy Council members are companies who work in or support the clean energy sector.
CEFC	Clean Energy Finance Corporation The CEFC is the Federal Government agency responsible for providing low cost finance to renewable and clean energy projects.
ENA	Energy Networks Australia ENA is the national industry body representing Australia's electricity transmission and distribution and gas distribution networks.
ESB	Energy Security Board Coordinating national energy policy body that is examining policy issues of the National Electricity Market.
ISP	Integrated System Plan Report prepared every two years on the transmission and generation needs of the NEM. AEMO will soon complete the 2022 Final ISP.
NEM	National Electricity Market Interconnected system including Queensland, New South Wales, Victoria, Tasmania, and South Australia.
Respondents	The respondents (participants) are key stakeholders selected across the energy industry which were asked a series questions focusing on defining the transmission problem and extrapolating pathway solutions that address the current set of challenges.
REZ	Renewable Energy Zones A Renewable Energy Zone is an area where transmission or jurisdictional planning arrangements are in place to incentivise new renewable generation development.
RIT-T	Regulatory Investment Test for Transmission The test done by transmission companies to determine whether a large project is the most efficient way of meeting an identified need. The test must be completed before the network can ask the AER to include the project costs in their regulated revenue.
Transmission	Electricity transmission is the infrastructure that takes energy from electricity generators to large loads and population centres. The networks receive a regulated rate of return as determined by the AER to fund ongoing maintenance and capital expansion.
WACC	Weighted Average Cost of Capital Rate of return that the networks receive from their regulated revenue as determined by the AER.



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