

Coordination of generation and transmission investment review - publication of final report

Context for this review

The COAG Energy Council asked the Australian Energy Market Commission (AEMC or the Commission) to undertake biennial reporting on when the transmission planning and investment decision-making frameworks will need to change, given the state of the power system. The Commission is of the view that change is needed at the present time to better coordinate investment in renewable generation and transmission infrastructure, so that our regulatory frameworks evolve to match the transition in the national electricity market (NEM).

Since this review commenced, the Australian Energy Market Operator (AEMO) published its inaugural Integrated System Plan (ISP) in July 2018, which identifies a pathway for developing the transmission network based on modelling the entire market over a range of possible future scenarios.

In August 2018, the COAG Energy Council tasked the Chair of the Energy Security Board (ESB) with taking the lead on the delivery of a work program to “convert the ISP into an actionable strategic plan” and report back to the Council’s December 2018 meeting. The final report is an input to the Chair of the ESB’s report, and provides a comprehensive reform package and implementation work plan to better coordinate investment in renewable generation and transmission infrastructure in the NEM.

A cohesive package of recommendations to transform coordination of generation and transmission investment

The Commission has made a series of recommendations for how investment in generation and transmission should be better coordinated into the future. The outcomes that would be achieved through the actioning of the recommendations form part of a cohesive package to transform the way generation and transmission would be planned, invested in and operated in the NEM. The recommendations complement each other.

The needed reform delivered by our recommendations ultimately serves the interests of consumers by increasing the efficient operation of the market and assigning risks to those parties best able to manage them, and seeks to do so in an affordable manner. Investing progressively, while planning strategically and nationally provides the agility necessary to avoid the risks of unnecessary investment or uneconomic levels of congestion that could arise from locking in investment too far into the future.

The process for coordinating transmission and generation investment must be rigorous and transparent, in order to maximise the long-term interests of consumers. Our recommendations create a phased reform work program to transform the coordination of generation and transmission investment. Taken together, the package of recommendations will **reduce relevant regulatory processes** for future ISPs by an estimated **18 months**, while still preserving confidence that necessary investments have been subject to robust cost-benefit analysis and consultation.

Stage 1: Implement reforms that are necessary to advance ISP group 1 projects

Build ISP group 1 projects

- In order to address the ISP group 1 projects, Dr Kerry Schott AO will submit a rule change request to the Commission to allow the three post-regulatory investment test for transmission (RIT-T) processes completed by the Australian Energy Regulator (AER) to be undertaken concurrently for the group 1 projects only.
- The AEMC will progress this rule change request on an expedited basis, with the rule

change process completed by the end of quarter 1 2019. This would save six to eight months off the regulatory process, while ensuring that the checks and balances for a robust process, and assessment that the investments are efficient, remain. This will provide sufficient time for the group 1 projects to be operational to meet the needs identified by AEMO in the ISP.

Stage 2: Embed an actioned ISP in the regulatory framework to progress projects going forward, and integrate large-scale energy storage systems into the NEM

An actioned ISP

- Actioning the ISP is required to allow the progression of the ISP group 2 projects in a timely manner. An actioned ISP requires clear links between the ISP and network investment decisions, and the ability for generation and network investment decisions to be coordinated by those best placed to implement them.
- Embedding the actioned ISP streamlines, removes duplication and de-risks the transmission planning and investment decision-making process to help TNSPs make the decisions that they need to be making to assist the transition of the power system. By removing duplication and streamlining the regulatory process, actioning the ISP would **reduce the time** it currently takes for the RIT-T and post RIT-T processes to be completed by an estimated **18 months**. Table 1 provides a summary of the actioned ISP process.

An improved RIT-T

The regulatory process for non-ISP projects can also be improved, to complement an actioned ISP. Reducing the time frame associated with completing the project assessment draft report of the RIT-T from 12 months to nine months will reduce the time it takes to complete transmission planning and investment decision-making processes.

Integrating large-scale storage systems

As part of the transformation of the generation fleet in the NEM, large-scale energy storage systems are increasingly seeking to connect to the grid. This has raised some questions about the applicability and appropriateness of the existing regulatory framework for large-scale energy storage technologies. The Commission recommends that AEMO submit a rule change request to create a new NEM registration category to accommodate energy storage systems. This is a pressing issue that needs to be addressed to remove barriers to entry for the connection of storage to the system.

Stage 3: Dynamic regional pricing to provide congestion signals to connecting parties, as well as implementing reforms to inter-regional transmission use of system pricing to ensure that the costs of interconnectors are aligned to those who benefit

Access reform - dynamic regions for pricing generation

- Actioning the ISP needs to be paired with the mechanisms necessary to allow generation to contribute to the enhancement of the networks and the management of congestion along it. We need a phased reform to address generator connection and access to the transmission network, and to make congestion management fit for purpose for the energy transformation - reform is needed now in order to be put in place for the future.
- First, dynamic regional pricing will be implemented, which will put a price on network congestion. Where congestion arises, and transmission constraints occur, pricing regions will be dynamically created through existing dispatch processes which will reflect transmission constraints that are actually occurring at that particular time.
- This will introduce a signal to generators that reflects the short-run costs of using the network, providing better information to generators.

Charging for use of the transmission system

- An actioned ISP focusses attention on the development of interconnectors. Given this, concerns have been raised about whether the current inter-regional transmission charging regime adequately attributes the cost of interconnectors to their beneficiaries.
- The Commission considers that there may be some elements of the existing inter-regional transmission charging arrangements that could be changed to better align the costs of interconnectors with those that benefit from the investment. The inter-regional TUOS arrangements should be re-examined in March 2019, and changes implemented alongside

dynamic pricing.

Stage 4: Information from dynamic pricing reveals congestion costs, with this being used as an input into the ISP's transmission planning

Access reform - better information

The information on patterns and costs of congestion and the dynamic location of regions that is revealed through dynamic regional pricing will be used by the market. This information will be available to AEMO and the wider market, enabling AEMO to develop future ISPs with increased accuracy, TNSPs to make efficient transmission investments informed by an enhanced ISP, and the AER to assess the efficiency of transmission investments.

Stage 5: Generators given a new option to fund transmission infrastructure, providing them with choice and control about how they access the wholesale market, as well as broader TUOS reform

Access reform - generators contribute towards transmission

- Generators will use the ISP, along with other sources of information, as an important guide to their generation and transmission investment decision-making and have the choice to compel TNSPs to provide transmission services consistent with the level of firm access (that is, guaranteed access to the wholesale market) paid for by generators. This final stage is a significant reform to the NEM, but is necessary in the face of the rapid transformation of the electricity sector.
- The market driven approach of phased access reform aligns the disaggregated, commercial decisions of the generation sector with that of the transmission sector. It provides the necessary tools for those who are best placed to bear the risk of resource investment to do so, facilitating the coordination of generation and transmission investment and avoiding unnecessary risks being placed on consumers.

Charging for use of the transmission system

Part of the access reforms involve generators paying for transmission. This raises broader questions about the rest of the TUOS charging framework. In order to allow a holistic consideration of TUOS issues, alongside the implementation of access reform, the AEMC will scope components of TUOS arrangements that need to be revisited, with the intention for necessary rule changes to be submitted by the COAG Energy Council by the end of 2019.

Renewable energy zones

Actioning the ISP and its complementary changes to access will facilitate renewable energy zones (REZs) through introducing more commercial drivers into transmission development. The changes to the access regime would enable better trade-offs to be made between the cost of transmission and the cost of generation in the development of REZs, and would align more of the risk of investment decisions with those who make them, and away from consumers. REZs forming through generators making a decision about the most efficient way to coordinate their investment in both generation and transmission infrastructure is likely to minimise total system costs since generators will be given more options and opportunities to fund transmission infrastructure, influencing transmission planning decisions. Under these changes, REZs will emerge as a consequence of generators' and prospective generators' commercial locational investment decisions.

Table 1: Summary of the actioned ISP

	STAGE IN PLANNING AND INVESTMENT PROCESS	RESPONSIBILITY
1	ISP input, assumption and scenario development	<ul style="list-style-type: none">- AEMO develops basic scenarios, inputs and assumptions, and consults publicly on this detail, with AER oversight and consumer involvement.- COAG Energy Council SCO provides information to AEMO on which jurisdictional policies should be included in the ISP modelling, or AEMO provides draft information to SCO for their amendment/endorsement.

	STAGE IN PLANNING AND INVESTMENT PROCESS	RESPONSIBILITY
2	Identify system-wide needs	<ul style="list-style-type: none"> - AEMO undertakes NEM wide modelling to determine system wide needs, which takes into account inputs from TNSPs. - A draft ISP is published for public consultation that details system-wide needs and credible options identified by AEMO (see stage 3 below). The AER is involved in the development of the draft report.
3	Identify credible options that address the system-wide needs	<ul style="list-style-type: none"> - AEMO identifies credible options for addressing system wide needs, with direct input from TNSPs. The credible options would not include non-network options in detail at this stage. - The credible options are also published as part of the draft ISP for public consultation. <i>The draft ISP would replace the current RIT-T project specification consultation report.</i>
4	Publication of the final ISP	<ul style="list-style-type: none"> - AEMO refines the ISP based on public consultation and publishes the final ISP. It provides a single recommended development pathway that outlines the priority projects needed across the NEM and the timeframes in which they should be developed.
5	Assess costs and benefits of credible options	<ul style="list-style-type: none"> - TNSPs are <i>required</i> by the NER to conduct a streamlined RIT-T for needs identified in the ISP, using the ISP scenarios, inputs and assumptions for the cost-benefit analysis of the ISP credible options. - TNSPs are required to consider non-network options, and to check with AEMO whether they would also meet the system-wide need identified in the ISP. - TNSPs publish a RIT-T project assessment draft report for public consultation.
6	Determine the “best” option	<ul style="list-style-type: none"> - TNSPs publish a RIT-T project assessment conclusion report that details what the TNSP has concluded is the “best” option. - TNSPs are required to check with AEMO that the preferred option addresses the system-wide need identified through the ISP. - The RIT-T dispute mechanism would remain the same as it is now.
7	Make decision on implementation of the best option	<ul style="list-style-type: none"> - TNSPs decide on implementation of the preferred option.
8	Undertake detailed costing and planning for the investment	<ul style="list-style-type: none"> - TNSPs undertake the detailed, project specific costing and planning for the investment, including obtaining land easements and environmental approvals, developing functional specifications for the assets and ordering/procuring the equipment. - TNSPs could commence the AER revenue determination process before this stage is complete (see Stage 9).
9	AER revenue approval	<ul style="list-style-type: none"> - TNSPs would continue to use the existing contingent project mechanism. If the project is not a contingent project, TNSPs may wish to delay it to the next regulatory control period.
10	Implement the investment	<ul style="list-style-type: none"> - TNSPs implement the investment – either commissioning and building the transmission investment, and/or finalising contracts with the non-network provider. - TNSPs could commence this process before the AER revenue determination is finalised.
11	Safety net	<p>The last resort planning power would reside with the AEMC as a “safety net” for the transmission planning and investment decision framework. If the responsible TNSP does not undertake a RIT-T for the ISP-identified need, or if AEMO does not agree that the preferred option identified by the TNSP is consistent with the overall strategic plan, the AEMC could direct a TNSP to consider a particular investment in detail through a streamlined RIT-T process.</p>

Source: Australian Energy Market Commission, *Coordination of generation and transmission investment*, final report, 21 December 2018, pp.21-23.

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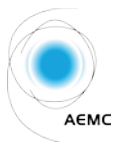
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21 December 2018



Implementation work plan

Timing	Planning	Access and congestion	Charging	Connection (and storage)	Economic regulation
December 2018	Dr Kerry Schott submits rule change request to the AEMC to allow concurrent AER assessment of post RIT-T process for ISP group 1 projects.				
March 2019	<p>AEMC final determination on rule change request to allow concurrent AER assessment of post RIT-T processes for ISP group 1 projects.</p> <p>AER to submit a rule change request to the AEMC to reduce the timeframe for completing the project assessment draft report of the RIT-T from 12 months to nine months.</p>			AEMO to submit rule change request to the AEMC to create a new NEM registration category to accommodate large-scale energy storage systems.	AER to submit a rule change request to the AEMC to remove clause 5.16.6 (where the AER makes a determination as to whether the preferred option satisfies the regulatory investment test) from the NER to streamline and reduce duplication.
January - June 2019	AEMC, ESB and COAG Energy Council's Senior Committee of Officials to work together to develop the necessary NEL and NER changes to implement the ISP.	AEMC to develop rule changes to progress the phased network congestion and access reforms.			



Timing	Planning	Access and congestion	Charging	Connection (and storage)	Economic regulation
August 2019	NEL and NER changes to be in place. AEMO starts consultation on the 2020 ISP, under the new framework.				
June – December 2019		AEMC to develop rule changes to progress the phased network congestion and access reforms.	AEMC to review IR-TUOS and TUOS arrangements and develop rule change requests on any changes.		
January 2020		COAG Energy Council to submit rule change requests on network congestion and access reforms to the AEMC.	COAG Energy Council to submit rule change requests on TUOS changes to the AEMC.	AEMC final determination on AEMO rule change request on new registration category for large-scale energy storage systems.	
July 2022	Information from dynamic regional pricing is being used to inform the ISP's transmission planning.	Dynamic regional pricing is implemented.	Inter-regional TUOS reforms are implemented.		
July 2023	Generators are allowed to fund transmission infrastructure, influencing transmission planning decisions.	Generators are allowed to fund transmission infrastructure, and receive access rights in return, implementing form transmission rights.	TUOS reforms are implemented.	REZs are enabled through generators funding transmission infrastructure.	Corresponding changes to the economic regulatory framework, reflecting that generators are funding transmission infrastructure, are in place.