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Bottlenecks affecting generation development in WA

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Executive Summary

Background

An energy transition is underway in Western Australia, led by State Government commitments and proposed policies that will shift the electricity sector towards more intermittent and low-emission capacity. These include:

- The State Government's economy-wide goal of net zero by 2050;
- Synergy's plans to close coal-fired power plants by 2030 and not build any new natural gas-fired power plants after 2030, while investing in 800 MW of new wind generation and 4400 MWh of storage;
- Western Power's rollout of network-connected batteries and standalone power systems; and
- Policies such as the Renewable Hydrogen Target that will require significant near-term investment in renewable projects.

In addition, electricity demand is expected to grow quickly due to Commonwealth policies such as the Safeguard Mechanism and fuel efficiency standards.

These policies combine to create an urgent requirement for new generation in the SWIS by the end of the decade.[1] However, this pressing need for new generation has created a problem. Investors who have been motivated by these policies to bring new intermittent and dispatchable projects onto the grid have encountered several significant challenges, including:

- A lack of transmission planning and investment creating uncertainty and grid congestion;
- Rigid interpretation of certification obligations by AEMO; and
- A grid connection process that is lengthy, costly and opaque.

Objective

The objective of this study is to provide a qualitative assessment of the challenges and bottlenecks of investing in new generation in the WEM, and the consequences if new generation cannot connect to the grid in a timely manner. In addition, recommendations are made regarding:

- Reforms that should be considered by Western Power and Energy Policy WA (EPWA) to eliminate the bottlenecks that prevent timely investment in new generation
- How the Applications and Queuing Policy (AQP) could be improved to make it fit for purpose
- The best approach for ensuring there is sufficient transmission infrastructure when and where it is needed.

Key Findings and Recommendations – Grid Connection

There has been much discussion within the industry regarding Western Power's current transmission connection process.

[1] AEMO's December 2022 Non-Co-optimised Essential System Services (NCESS) tender forecast a shortfall of up to 830MW by 2024 and, in various forums, Western Power has presented information that indicate that somewhere between 30GW and 43GW of additional renewable generation may be needed by 2030.

At up to five years, it is self-evident that the process is exceedingly long, and, noting that it is currently based on a first-in, first-served prioritisation approach, we are of the opinion that it will be unable to effectively prioritise projects in a manner that will deliver outcomes that are aligned with Government policy and broader efficiency objectives. The first-in, first-served approach also diminishes the benefits that can come from adopting a robust transmission planning process, as the ordering of how transmission connection applications are reviewed will almost inevitably be misaligned with how the expansion of the transmission network is planned (e.g., #1 in the connection queue may be in an area that is not planned for transmission development for 15 years).

The current Applications and Queueing Policy (AQP) process, and in particular the quite fungible timeframes that are embedded within it (e.g., 'reasonable', 'best endeavours', etc.), are likely to contribute to the long-time frames. In any event, more definitive, measurable timeframes, with clear incentives to perform, would only help the existing situation.

Finally, and most concerningly, Western Power's own statistics indicate that only 5% of applications are making it through to the end of the process, which almost certainly indicates that there is a misallocation of connection resources. This drop-out ratio could indicate that any or all the following could be occurring:

- There are lots of "tyre kickers" entering the process in the first place who then fall out once they become fully aware of the costs/complexity etc – potentially crowding out genuine applicants; and/or
- The process is so frustrating that genuine applicants are giving up on the process (or the lengthy timeframes are causing them to miss out on the 'market opportunity' that led them to enter the process in the first place); and/or
- Offer arrangements are not commercially acceptable (or the design of the underlying process means that applicants are unable to access financing).

Having regard to the above and noting that Western Power is in the process of either implementing some changes to its existing process, or consulting on several potential changes to that process, the following table summarises the four areas that we have identified where improvements should be considered.

Table 1: Improvements that should be considered

Improvement area	Specific improvements that could be considered
Pricing arrangements to better balance supply and demand for connection services to allocate them to their highest value use	Allow applicants to pay for a premium (streamlined/quicker) service Ensure prices for each of the different stages of the connection process are reflective of the forward-looking costs of providing that service
Arrangements that incentivise Western Power to deliver efficient levels of service and to act commercially	Apply some form of service incentive scheme to the treatment of generation connections – that is, provide financial "carrots" and "sticks" to incentivise Western Power to seek out areas of improvement. Adopt a Guaranteed Service Level (GSL) scheme, to provide a further financial incentive for Western Power to maintain minimum levels of service (e.g., timeframes) for connections.

Improvement area	Specific improvements that could be considered
Arrangements that are likely to improve the 'strike rate' of applicants progressing through to an Access Contract	Incentivise Western Power to maximise the amount of pertinent technical, commercial, and procedural information that is published and made available to proponents upfront (a 'no surprises' approach). Adopt a more appropriate allocation of commercial risk between Western Power, the Applicant and AEMO, by removing the rigid two-year timeframe underpinning the setting of the Certified Reserve Capacity. Instead, prescribe that capacity credit 'amounts' can be pre-approved prior to the "evidence of an Arrangement for Access…", subject to certain conditions being met; for example, the project must be up to a certain phase of the connection process to be eligible (e.g., the Project Planning phase).
Ensuring alignment with the development of the shared transmission network	The improvements outlined above should assist in ensuring alignment between the connection process and the planning process by incentivising developers to focus applications on areas that are planned to be served by the future transmission network. In particular, allowing parties to pay for a premium connection process would logically lead generation proponents to focus their resources on applications that are aligned with the transmission development plan.

Key Findings and Recommendations – Transmission Planning

One of the factors that led to this project being undertaken was the significant difference between the two recent plans that investors have looked to for forecasts of the need for transmission development in WA:

- The SWIS Demand Assessment (SWISDA), produced by EPWA in May 2023, and
- The Whole of System Plan (WOSP) last published in August 2020.

The SWISDA reported that 4000km of new network would be needed by 2042 whereas the WOSP forecast almost no new transmission being needed – a stunning difference between the two plans in what was a relatively short time period.

That said, our assessment of the forecasts for both generation and demand in the two reports leads us to the observation that they were so different that it would be surprising if the outcome for network requirements in the SWISDA was not significantly greater than in the WOSP. We are unable (and were not requested) to comment on whether the quantum of 4000km of new network in the SWISDA is justified, as there is too little information in the SWISDA to inform an independent assessment. However, we also note the SWISDA was effectively a single point analysis with no reported consideration of uncertainty and no reported consideration of willingness to invest or to consume, including no note of which party would be expected to pay. These factors can be critical in forecasting generation and demand.

In summary, we consider that the SWISDA:

- **Lacks credibility in the eyes of investors:** The opaque and ad hoc nature of its development, the (apparent) lack of any assessment of customers' willingness to pay for transmission services, the lack of scenario analysis, along with the vastly different projections it contains as compared to the preceding report that investors would have been most aware of (the WOSP) and the lack of a clear description as to what drives the differences, is likely to undermine the credibility of the SWISDA in the eyes of investors and the SWIS as a destination for investment, which is clearly an unwelcome situation; and

- **Risks creating a perception of Government overriding the formal network planning role of Western Power:** Western Power, which is charged with undertaking transmission planning in accordance with the WEM Rules, appears, on the face of things[2], to have been excluded from the transmission planning process. This unexplained change in who is undertaking transmission planning reduces the credibility of the planning process more broadly and increases the risk to investors contemplating an investment in the SWIS.

More broadly, we would recommend that:

- **There should always be only one authoritative source of network planning**: To do otherwise creates uncertainty in the planning arrangements, which increases the risk to parties contemplating investment in the SWIS. In our opinion, Western Power, the asset owner, is the logical body to continue in this role. Government may, however, choose to consider the creation of a new and independent planning body as is the case in a number of other jurisdictions.[3] This would be a significant change that should only be adopted after careful consideration, and if adopted, publicly explained to reduce any residual uncertainty that might otherwise be created within the investor community. In saying this, the most important thing is for such a body to be seen by investors as being a credible planning authority. This will be the case if:
  - That body is independent (particularly given the mix of public and private ownership of existing generation and likely, future generation, in WA);
  - It demonstrates that it has the necessary skills to undertake the complex task of planning the electricity transmission system (particularly in the context of the broader energy transition happening in WA), which may be even more challenging in a relatively smaller industry sector (e.g., as compared to the NEM);
  - There is a robust development and review process, for example, planning processes that are transparent and subject to input from stakeholders and, in certain circumstances, able to be reviewed, presumably as is the case now, by the ERA; and
  - It uses consistent and robust approaches, processes and methodologies.

We note that in the later stages of preparing this report Government announced the formation of Powering WA. The principles summarised above are therefore highly relevant to how this new body is structured and operates and interacts with Western Power, the ERA and incumbent and future stakeholders.

- **Charging and cost-recovery mechanisms for transmission investments should be clarified:**

2 We say this noting conflicting advice we received during this work that Western Power was involved in preparing the SWISDA and the AEC being told by Western Power management that Western Power was not involved.

3 For completeness we note the model that has operated in Victoria from the start of the NEM whereby planning and asset ownership are functionally separated with AEMO-Vic undertaking planning and AusNet Services being the predominant owner. More recently, other jurisdictions are also adopting similar arrangements in relation to renewable energy zones although the TNSP asset owner has previously also undertaken planning.

- Regardless of whether planning is developer-led or plan-led[4], charging and cost-recovery mechanisms should be clear and applied equitably to all connecting projects (in order to create a level playing field). In the case of a plan-led approach, clear articulation of the charging arrangements upfront is necessary in order for the planner to be able to place any credence on the demand and generation projects that are proposed/forecast. In the case of a developer-led approach, charging arrangements should be available to potential developers to allow them to make similar assessments.[5] Given the rapid transition of the electricity sector that is envisaged, charging and cost recovery arrangements, if necessary, should be reviewed and amended as soon as possible, so there is clarity around who pays for what transmission and on what basis, ensuring that any assessment of customers' willingness to pay for those transmission services reflects their future financial exposure. For example, the recent proposal to allow for proponents to contribute $100,000/MW towards funding of new transmission is a case in point which may be justified in some cases as a means to identify willingness to pay for access, especially in a developer-led arrangement but less so in a plan-led regime. Absent this, information provided by customers as part of the development of any transmission development plan regarding their likely future demands will have limited value, which in turn increases the risk to investors of making investment decisions on the basis of that plan.
- **A credible transmission plan needs to be maintained/produced**: For investors to consider a transmission development plan to be credible, there needs to be certainty regarding:
  - When a transmission plan will be produced, how often it will be revised, the criteria against which a re-opening of the plan would be assessed (e.g., a plan will be updated in the event of X), and what protections will be afforded to investors who have initiated connection activities on the basis of a previous plan – which also links with commercial risks of dispatch congestion
  - The process for its production, and that the process is transparent
  - How Government policy has been reflected in that plan
  - How real options analysis[6] has been accounted for in the planning process, in order to account for risks large projects may proceed at a slower pace, not at all or with evolving designs
  - The scenarios (or the criteria that underpin the development of scenarios) that need to be tested in the plan
  - How the plan integrates with, and is supported by, a robust transmission connection process.

4 We elaborate on this concept in the body of the report, however in summary, we believe that there is an implicit shift away from what has traditionally been an incremental, 'developer-led' approach, whereby individual developers sought connection and, where needed, new network has been developed, to a more centralised, plan-led approach. This shift is inherent with the WEM rules which already include an option for Ministerial determinations relating to Priority Projects. We discuss the implications of this in more detail in the body of the report.

5 Noting that the specific mechanisms that should be adopted are beyond the scope of this paper.

6 A 'real options' analysis is simply a way of applying option valuation techniques to real-world investment decisions.

1. Introduction

1.1. Background

An energy transition is underway in Western Australia, led by State Government commitments and proposed policies that will shift the electricity sector towards more intermittent and low-emission capacity. These include:

- The State Government's economy-wide goal of net zero by 2050;
- Synergy's plans to close coal-fired power plants by 2030 and build no new natural gas-fired power plants after 2030, while investing in 800 MW of new wind generation and 4400 MWh of storage;
- Western Power's rollout of network connected batteries and standalone power systems; and
- Policies such as the Renewable Hydrogen Target that will require significant short-term investment in renewable projects.

In addition, electricity demand is expected to grow quickly due to Commonwealth policies such as the Safeguard Mechanism and fuel efficiency standards.

These policies combine to create an urgent requirement for new generation in the SWIS by the end of the decade.[7] However, this pressing need for new generation has created a problem. Investors who have been motivated by these policies to bring new intermittent and dispatchable projects onto the grid have encountered several significant challenges, including:

- A lack of transmission planning and investment creating uncertainty and grid congestion;
- The rigid interpretation of certification obligations by AEMO; and
- A grid connection process that is lengthy, costly and opaque.

1.2. Objectives

The objective of this study is to provide a qualitative assessment of the challenges and bottlenecks of investing in new generation in the WEM, and the consequences if new generation cannot connect to the grid in a timely manner. In addition, recommendations are made regarding:

- Reforms that should be considered by Western Power and Energy Policy WA (EPWA) to eliminate the bottlenecks which prevent timely investment in new generation
- How the Applications and Queuing Policy (AQP) could be improved to make it fit for purpose
- The best approach for ensuring there is sufficient transmission infrastructure when and where it is needed.

1.3. Approach

The approach used in addressing the objectives of this assignment included:

- Review of relevant documents

[7] AEMO's December 2022 Non-Co-optimised Essential System Services (NCESS) tender forecast a shortfall of up to 830MW by 2024 and, in various forums, Western Power has presented information that indicated that somewhere between 30GW and 43GW of additional renewable generation may be needed by 2030.

- Formulation of observations about how, why and, on a qualitative level, the degree to which specific aspects of the generation connection and transmission planning processes are serving as barriers to economically efficient investment in new generation capacity in WA
- Formulation of changes that could be made to the connection and transmission planning processes which would reduce or remove the barriers that potential investors in generation facilities face.
- Meetings with AEC staff and members to get their views on the nature, strength and cause of barriers or challenges to generation investment in the SWIS and what measures could be taken that would serve to reduce or remove those barriers.
- Meetings with key stakeholders in transmission planning and the connection process – including representatives from AEMO, Western Power and the Economic Regulation Authority (ERA) – to understand what their views are regarding:
  - How and the extent to which specific aspects of the generation connection and transmission planning processes are serving as barriers to economically efficient investment in new generation capacity in WA
  - How specific aspects of those processes could be addressed to reduce the associated barriers
  - The relative merits and feasibility of the ideas generated by the OGW project team in consultation with the AEC and selected members for reducing the barriers posed to investment in generation by the current connection and transmission planning processes.
- Development of (a) a final set of observations about the impact of the current version of generation connection and transmission planning process on investment in generation, and (b) a list of measures/revisions that could improve the grid connection and transmission planning processes.

1.4. Caveats

Several important caveats must be noted regarding the conclusions and recommendations contained in this report:

- Of primary importance is the fact that the policies and processes associated with transmission planning and the connection of generation plant are under active review by Western Power, EPWA, AEMO and the ERA (and possibly others). As noted above, we learned about a number of these review activities and their status through conversations with several of these parties. However, these conversations were undertaken under the conditions of confidentiality, as many of the activities being undertaken are still in-process or only in their planning stages. In many cases and for these reasons, the representatives of the organisations we spoke with were not able to provide much detail other than the fact that a topic was on their radar.
- As a result, the current transmission planning and connection process landscape is in significant flux. Many of the conclusions and recommendations we provide may already be in process by these groups, and in some cases, recent decisions have been made that align with what we have recommended in this report. As a result, our list of recommended areas for improvement should be seen as a checklist against which the revisions these organisations identify – which will become increasingly clear as their review activities progress – can be assessed for completeness.

- It is also the case that our review was always intended to be qualitative. We have not been asked to – nor would we have been able to, given the information available – quantify the impact of the current challenges and barriers currently present in the transmission planning and connection processes of the SWIS on the electricity sector, its customers and participants or the WA economy in general.
- Regardless, and even though it is undoubtedly good that the policies and processes associated with transmission planning and the connection of generation plant are under active review, it is also the case that the uncertainty that currently exists, and the fact that there is neither a clear path nor timeframe for their resolution, puts at risk the ability of the market to meet the transition requirements and timeframes that have been set by government.

1.5. Structure of the remaining sections of this report

The remainder of this report is structured as follows:

- Section 2 presents our observations about the process for getting a generator connected to the Western Power grid and the problems it creates for investors and the state's electricity users and economy.
- Section 3 provides our observations and recommendations regarding the challenges that the current approach being taken to transmission planning pose to parties considering an investment in generation plant.

2. Connecting to the Transmission Network

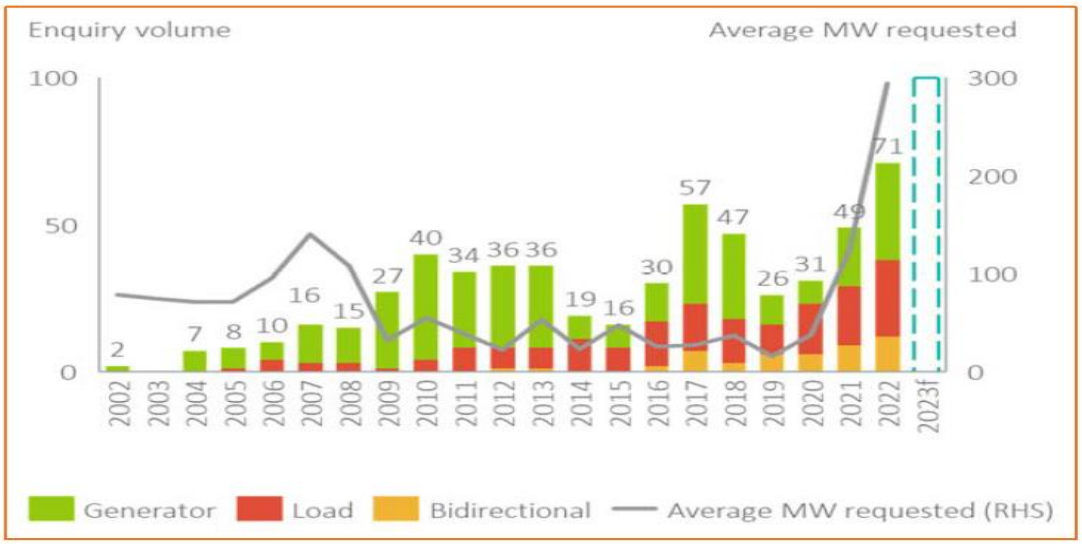
2.1. Background

In its approved AQP (31 March, 23), Western Power states that as a general guide, the process for connection applications consists broadly of the following phases:

- **Enquiry**: In the enquiry phase Western Power provides guidance to the applicant regarding the information required to complete a connection application form. An enquiry assessment assists the applicant to identify a suitable connection point and evaluate the feasibility of the connection application.
- **Initiation**: In the project initiation phase Western Power studies any constraints applicable to the connection application, assesses if the application is competing for capacity and identifies viable options to augment or modify the network in order to meet the requirements of the connection application.
- **Scoping**: In the project scoping phase Western Power develops a scope of work for each option identified to augment or modify the network, assesses each option and selects the technical solution to be implemented.
- **Planning**: The project planning phase requires Western Power to develop a business case, the execution of contracts for services (including the interconnection works contract, the electricity transfer access contract and any other associated contract or documentation), detailed designs and construction plans for the final technical solution to augment or modify the network (including financial and schedule estimates).
- **Construction and commissioning**: In the construction and commissioning phase Western Power constructs and commissions the approved augmentations or modifications to the network under the terms of the interconnection works contract.
- **Closeout**: In the closeout phase the connection asset comes into operation under the terms of the electricity transfer access contract.

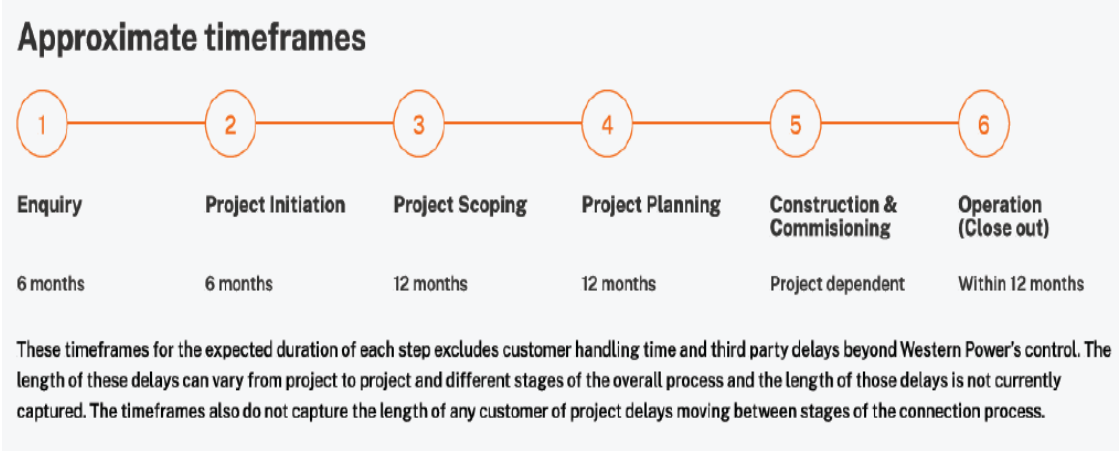
Through various public documents, Western Power has revealed several other pertinent pieces of information related to its connection process, including that:

- Connections, in terms of both the number of enquiries as well as the size of projects (MW), have been increasing significantly; and
- Generator enquiries have been the primary driver of these increases.



Source: Western Power, *Further Access Arrangement Information*, 18 January 2023, page 8

Western Power has also been quite open as to the timeframes it can sometimes take to successfully progress through the connection process, with this taking up to 5 years in some cases.



Source: Western Power, *Further Access Arrangement Information*, 18 January 2023, page 14

Western Power have further stated that[8]:

- Many initial enquiries are "*now waiting up to 33 weeks to receive the Detailed Enquiry Assessment*", and
- "*only 5% of initial enquiries proceed through the process to an Access Offer, meaning significant effort is spent assessing enquires that do not proceed, indicating potentially significant opportunity to improve the overall process*"

8 Western Power, *Further Access Arrangement Information*, 18 January 2023, page 9

Western Power currently adopts a first-in, first-served approach, which means that the date of application largely sets the priority order to progress through what can be years of complex planning and engineering studies and design work to reach an access offer. Western Power have previously stated that they considered the first-in, first-served approach to be consistent with the Electricity Networks Access Code (the Code), although they have acknowledged that they can move away from this provided such a departure is necessary to meet the Code objective[9]. In this context, Western Power has recently released a paper[10] "*Facilitating timely connection of critical projects - Information paper*", the purpose of which was to "*set out Western Power's proposed approach to ensuring that Western Australia's critical projects can proceed, in line with the State's commitment to achieve net zero and keeping pace with the unprecedented uplift in demand for major customer network connections*". More specifically, Western Power is "*developing a framework for assessing and identifying a critical project based on principles and criteria. Projects identified as critical projects will then be fast-tracked for connection"*. On face value, this approach, if implemented, would be a move away from the first-in, first-served approach.

More broadly, Western Power is on public record as having undertaken a process improvement program[11], the objective of which was to identify opportunities for improvement to[12]:

- Enhance customer experience
- Reduce the timeframe
- Identify alternate process pathways & delivery approaches

Western Power has previously stated that the improvements include[13]:

- Re-organizing the process to eliminate unnecessary work & reduce waiting times
- Giving customers more choice to proceed with higher uncertainty and risk
- Enabling customer self-service to de-constrain studies, design and construction
- Enabling cross-functional collaboration to reduce handovers and re-work
- Refreshing underlying frameworks to enable process change improvements

They state that[14] "*once fully implemented, the total connection process timeframe is expected to reduce by up to 2 years*[15]".

2.2. Observations

Notwithstanding Western Power's process improvement program, and acknowledging that we are not across all the specific aspects of Western Power's connection process, OGW's high-level observations are that:

- The process simply needs to be shortened:
  - At ~5 years (or even at 4 years), this process needs to be shortened dramatically to:

9 Western Power, *Further Access Arrangement Information*, 18 January 2023, page 11

10 Western Power, *Facilitating timely connection of critical projects - Information paper,* October 2023

11 Further to the Western Power's public announcements, we were fortunate to have the opportunity to meet directly with Western Power as part of this project. As this was a confidential discussion, we have not divulged the content of that discussion in this report; rather, we have adopted a strawman/best practice approach to assessing potential changes, having regard to what Western Power has, until now, discussed publicly. This may mean that our recommendations can be used more as a check-list against which Western Power's proposed changes can be assessed.

12 Western Power, *Major Customer Connections Forum*, 16 June 2023

13 Ibid

14 Ibid

15 Although this will depend on the customer's project requirements, risk appetite and pathways chosen.

- reduce the opportunity cost to applicants of going through the process,
- increase investor certainty (and reduce risk), and
- meet the forecast capacity shortfall of approximately 4,000MW by 2032-33, and from the broader WA community's perspective, to enable the energy transition that is going to be required in WA to support the state's decarbonisation objectives (e.g., to cease all coal by 2030), with continued delays in connecting new generation inevitably leading to an extension of the existing (coal fired) generation fleet, and/or lower levels of reliability.

  - Western Power's publicly stated process improvements appear, on face value, a sound start, but while Western Power have made these broad comments, stakeholders still don't know what much of this means practically, and moreover, the ability for those changes to deliver the purported 2-year reduction in timeframes is uncertain, particularly in the face of an expected large increase in the number of applications, and uncertainty around whether Western Power proposes to deploy additional resources to the transmission connection function (or, if it proposes to redeploy existing resources to fast-tracking what it deems to be critical projects, what that means for the timeframes of other connecting parties[16]).

- Changes need to focus on improving the strike-rate of connections: Western Power has provided statistics indicating that only 5% of applications are making it through to the end of the process[17]. This is of serious concern, as it could indicate that any or all the following could be occurring:

  - There are lots of "tyre kickers" entering the process in the first place who then fall out[18] once they become fully aware of the costs/complexity etc – potentially crowding out genuine applicants; and/or
  - The process is so frustrating that genuine applicants are giving up on the process (or the lengthy timeframes are causing them to miss out on the 'market opportunity' that led them to enter the process in the first place); and/or
  - Offer arrangements are not commercially acceptable (or the design of the underlying process means that applicants are unable to access financing).

- It will be important that the process is clearly tailored to allow the assessment of connection applications to occur in conjunction with the planned development of the shared transmission network, with the latter underpinned by a process that investors perceive as being highly credible (and therefore able to be invested against)[19]. This will require:

16 There is also a broader question around whether some sort of dispute resolution process for non-fast tracked projects who complain they have been adversely impacted is required, and if so, the impact this has on timeframes and resources.

17 Although there we are not aware of there being any information as to why applicants are dropping out, which, if not being captured, should be data that is captured (e.g., through surveying a selection of project proponents that dropped out) and reported in the future, as we or of the opinion that there would be significant diagnostic value in this information.

18 It could also mean that there is insufficient transmission capacity and connection enquiries just "sit" in the queue waiting for transmission augmentation, or on a related issue, that there is a lack of information about where there is grid capacity, leading some developers to lodge several 'speculative' enquiries hoping to get one location with capacity.

19 A lack of a credible transmission development plan adds to the difficulty of making good locational decisions, as investors price in the uncertainty that plan creates, which flows through to delays in required additional generation.

- Western Power to move away from its current first-in, first-served approach, to one that prioritises network connections in some way (whether via market signals, or, as a second-best solution, some criteria-driven approach[20]), to ensure the allocation of Western Power's scarce connection-focused resourcing is efficiently allocated to those connections that are most likely to contribute to the Government's decarbonisation policies (e.g., those that are co-located in areas planned to be serviced by the shared transmission network).
- Network connections to be assessed concurrently with (as opposed to sequentially to) the development of the transmission shared network build out. Otherwise, WA could be facing in the order of 7+ years for the shared transmission build to occur, then another 4 to 5 years for a generator to receive a network connection to that network[21].

- Over time, firm deadlines for completing the different parts of the connection process should be adopted
  - The current AQP appears to have quite fungible timeframes (e.g., reasonable, best endeavours), which is inconsistent with a best practice process

2.3. Recommendations

We have identified 4 areas in which improvements should be considered:

- Pricing arrangements to better balance supply and demand for connection services to allocate them to their highest value use
- Arrangements that incentivise Western Power to deliver efficient levels of service and to act commercially
- Arrangements that are likely to improve the 'strike rate' of applicants progressing through to an Access Contract
- Ensuring alignment with the development of the shared transmission network

These are discussed in order below.

2.3.1. Pricing arrangements to better balance supply and demand for connection services to allocate them to their highest value use

Allow applicants to pay for a premium (streamlined/quicker) service

Western Power should implement pricing arrangements that are more likely to better balance supply and demand for connection services, such that those services are allocated to their highest value use. This could be in the form of a premium (streamlined/quicker) service. It would need to be supported by prescribed (and transparent) levels of service, penalties for non-performance against those levels of service[22], and would be complemented by the publishing of data around base levels of service (to allow a prospective connecting customer to assess their marginal willingness to pay for the incremental increase in the level of service that they expect to receive as a result of purchasing the premium service, as compared to the base level of service).

20 Noting that this appears to be the Western Power's preferred approach.

21 To highlight this point, it is our understanding that Western Power are now telling developers to wait until the outcome of the ROI process (likely to be late Q1 or Q2 next year) before proceeding with enquiries, as they don't know where there will be capacity. This highlights the linkage between the transmission development planning process, and the transmission connection process.

22 Noting that this is covered under the next section (S-Factor scheme and GSL scheme).

All-in-all, this would:

- Allow connecting parties that are more serious about connecting to self-select into the shorter, premium process, as they will be more likely and more willing to pay the fee to obtain a quicker service (the corollary is that this would reduce the impact 'tyre kickers' have on the treatment of 'genuine' applications).
- Allow Western Power to generate more revenue that could be used[23] to support the additional resourcing required to deliver the quicker process, for those that are most likely to benefit from a quicker process (as evidenced by their willingness to pay for that quicker process)
- Provide a strong foundation for Western Power to move away from its existing '*first-in, first-served* approach, without relying on a subjective assessment of an Applicant's worthiness for being prioritised (based on some measure of "land availability" or "financial capacity" etc)
- In our opinion, be consistent with the Code, as:
  - Connecting parties will consume the premium (expedited) connection services up to the point where the marginal benefit to them equals the marginal cost of providing that service, which is consistent with allocative efficiency which is a foundational component of the Code Objective ("*to promote efficient investment in, and efficient operation and use of, services*")[24]; and
  - It would allocate scarce connection-related resources to their highest value use.

Notwithstanding the above, this approach could be supplemented by several other protection/support mechanisms, including:

- Protections against 'slot-hoarding' (e.g., only two premium service connections per customer, or no more than 2 of a certain customer type – e.g., hydrogen production facilities); and
- Agreed criteria with Market Participants to allow some limited re-prioritisation of 'base' (e.g., non-premium) connection applications (i.e. a process for moving away from a '*first-in, first-served* basis for some connections, without having to pay the premium fee to receive a premium service). In this context, a premium service could co-exist with a 'criteria-based' approach, similar to what Western Power appears to be proposing in its "*Facilitating timely connection of critical projects - Information paper*".

Ensure prices for each of the different stages of the connection process are reflective of the forward-looking costs of providing the base level of that service

We are of the opinion that prices for each of the different stages of the connection process should be reviewed by the ERA to re-confirm that they are reflective of the *forward-looking* economic costs of providing the base level of that service. This means that if demand is expected to exceed supply for those services, the price signal should reflect the cost at the margin of either ramping up resourcing to accommodate that level of service, including the impact on systems, resources, training etc, or the opportunity cost to the connecting customer not being able to access that service. This will ensure that there is both a funding base for baseline connection applications at the margin, and that connecting customers face the right (economically efficient) price signals.

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23 We say "could" be used, as if they accepted the application (and the associated fee) related to the premium service, and then failed to deliver that service, they would be subject to financial penalties under the proposed S-Factor scheme (outlined in the next section)

24 The stated objective of this Code is "*to promote efficient investment in, and efficient operation and use of, services of networks in Western Australia for the long-term interests of consumers in relation to: (a) price, quality, safety, reliability and security of supply of electricity; (b) the safety, reliability and security of covered networks; and (c) the environmental consequences of energy supply and consumption, including reducing greenhouse gas emissions, considering land use and biodiversity impacts, and encouraging energy efficiency and demand management*".

2.3.2. Arrangements that incentivise Western Power to deliver efficient levels of service and to act commercially

Apply some form of service incentive (S-factor) scheme to the treatment of generation connection

We are of the opinion that Western Power could be subject to transparent financial incentives to ensure that its performance aligns with those of a commercial entity. Whilst we acknowledge that some stakeholders may consider Western Power's status as a Government-owned business a barrier to implementing an effective performance incentive scheme[25], we believe that given the urgency of the connection issue, it is something that should at least be trialled.

An S-factor scheme (also known as a service performance incentive scheme) is a symmetrical scheme (in that it includes both a carrot and a stick) linked to the achievement of certain levels of service[26]. It could be trialled to incentivise Western Power to seek out areas of improvement and implement process improvements where the financial benefit they receive exceeds the cost.

More specifically:

- The incentive amount could be related to the increase in (or lost) economic benefit that a connected generator is expected to deliver as a result of being connected either more quickly (or slowly) than a pre-determined target level. For example:
  - The incentive/penalty could be denominated in terms of $/MW of installed capacity, per month, per generation type – it could be adjusted each year based on new information[27]; and
  - The incentive/penalty rate could reflect the SRMC of the marginal generator that aligns with the generation profile of that type of generator in the month(s) where the advancement/delay in connection occurred. It could also include some representation of the value of bring forward of that capacity into the market.
- A scheme such as this could in effect be split between 'premium' services and 'base' services (i.e., different performance thresholds could be set across the two types of services, reflecting a) those that would have been 'promised' to customers purchasing the premium service; and b) those that customers entering into the base service would reasonably expect to achieve, given existing funding levels[28])
- A scheme such as this will provide Western Power with a strong financial incentive to 'be commercial' as it effectively allows Western Power to see through to the broader market benefits (costs) that in the end, customers receive, as a result of facilitating the earlier (latter) connection of generators and to allocate resources as efficiently as possible; and
- Other parameters (beyond timeframes) could also be considered for inclusion in the scheme, for example:

25 The reasons might be varied, including that as a Government-owned business, they may not respond to those incentives, or that it is inappropriate to provide incentives to a Government-owned business to do their job.

26 These levels of service could be set/approved by the regulator, and are likely to reflect baseline historical levels of service.

27 This is similar to the Customer Export Curtailment Value (CECV), which the AER uses to determine the value of additional energy exported by behind the meter PV systems, which in turn is used to determine whether a network business' proposal to increase distribution system hosting capacity is efficient or not.

28 Service targets generally reflect historical levels of service provided (e.g., the average of the last 2 years). That said, if Western Power moves away from a first-in, first-served approach to dealing with connection applications, the more complex it may be to ascribe a base level of service metric to those connection applications, particularly early on in the new regime.

- The proportion of customers progressing through to a final access offer (which might incentivise Western Power to enact improvements that might, for example, reduce the probability of 'tyre kickers' entering the connection process in the first place[29]), and
- Assessment against customer satisfaction scores.

Notwithstanding the above, it is important that the service metrics do not lead to perverse incentives[30] and that the pre-determined targets underpinning the scheme are developed in a robust manner, which we believe will likely require at least two years of historical data. Whilst the data required may align with the information that we understand[31] Western Power is now required to collect and publish quarterly, as it should be, this should not be taken as a given. Instead, we would recommend that the scheme design be conceptualised upfront, with the data required to support that scheme then compared to the data that Western Power is required to publish (with any data gaps identified, and, subject to a cost-benefit assessment, collected and reported over time).

Adopt a Guaranteed Service Level (GSL) scheme, reflecting minimum levels of service

The current AQP appears to have quite fungible timeframes (e.g., reasonable, best endeavours). Fungible, non-specific timeframes, particularly when coupled with a lack of financial incentives, tends to, everything else being equal, lead to worse outcomes to customers from both a cost, level of service and overall efficiency perspective. And customers, in this case, are both the connecting generators, and all WA customers who benefit from enabling new, renewable sources of generation being built.

We understand that as part of its most recent 2022-2027 Access Arrangement (AA5) process, Western Power successfully pushed back on timeframes for undertaking certain parts of the connection process being included in the final AA5 decision. In making its decision, the ERA noted that this was to allow Western Power time to develop data that the ERA could then use to monitor performance and set targets.

Western Power should be subject to some form of Guaranteed Service Level (GSL) scheme as soon as the foundational datasets[32] required to implement it are available[33].

In summary, a GSL scheme would:

- Impose a financial penalty on Western Power if minimum levels of service[34] are breached, providing a stronger incentive than it currently faces for breaching base levels of service customers would expect to receive as a minimum

29 An example of this might be Western Power providing more information up front to connecting parties to ensure potential connecting parties are positioned to make informed decisions around whether to enter into the connection process.

30 For example, to only focus on average levels, at the expense of those proponents experiencing the worst levels of service, or to incentivise Western Power to 'dump' what would otherwise be good projects to improve the proportion of customers progressing through to a final access offer (if that was a performance metric that was financially rewarded under the Scheme).

31 Noting that it is our understanding that Western Power has committed to publishing connection-related statistics on a quarterly basis.

32 By foundational datasets, we mean the underlying data that relates to the service(s) being captured under the GSL scheme. For example, if a GSL related to the proportion of enquiries responded to within a certain, minimum, timeframe, the foundational dataset would be the historical proportion of enquiries responded to within that minimum timeframe.

33 However, we would caution against waiting for the 'ideal' or 'perfect' dataset to become available before designing and implementing the scheme (i.e., don't let the 'perfect get in the way of the good'). It could also be that benchmarks could be established based on other business' outturn levels of service, if available, and if considered translatable to Western Power.

34 An example of this would be if Western Power did not meet minimum timeframes, it could be financially penalised under the GSL arrangements.

- Augments the S-Factor scheme we recommended above, as it reduces the incentive under the S-Factor scheme for Western Power to target improvements in the 'average' customer connection time (which is what tends to be rewarded under such a scheme), at the expense of outliers/harder to service customers.

2.3.3. Approaches to improve the 'strike rate' of applicants progressing through to an Access Contract

Efficient 'pricing' of connections will assist (see earlier recommendation)

The efficient pricing of connection services should assist:

- In filtering out 'tyre kickers', whilst also providing an opportunity for 'serious', well-prepared proponents to access a more streamlined connection process
- By allowing well-prepared proponents to self-select the priority connection process, reducing the risk that they 'drop out' of the connections process because of:
  - frustration at the connection timeframes, or
  - they have missed the market opportunity.

Maximise the amount of (pertinent) technical, commercial and procedural information that is published and made available to proponents upfront (a 'no surprises' approach).

Western Power's proposal to increase the amount of information available to applicants upfront is to be commended and built upon wherever possible, as this will assist in:

- Reducing the risk of applicants entering the process without fully understanding the risks, issues, data requirements and available capacity;
- Enabling applicants to better assess the relative merits of their proposed projects, enabling them to prioritise them internally (before even entering into the connection process); and
- Improving the quality of applications coming in, which everything else being equal, should reduce the time required to assess an application.

We note that if the right financial incentives are created by way of our proposed S-Factor and GSL scheme, Western Power should be incentivised to adjust its process (including the amount and type of information published upfront) over time where it is efficient (i.e., where the cost of adjusting the process is expected to deliver a positive improvement in the service metric that is being measured and financially rewarded).

Notwithstanding the above, we recommend that Western Power periodically undertake a formalised post implementation review process across a range of different types of generation projects (e.g., size, type) and project proponents (e.g., Government, small private, large private), to explicitly identify the:

- Information that those connecting parties had to obtain pre-application, and where the proponent obtained that information;
- Information that was obtained post-application, and where the proponent obtained that information; and
- Information applicants wished they had had upfront or at various other parts of the process.

The purpose of a periodic exercise such as this would be to implement a systemic approach to capturing all the information that proponents are collecting and using (and would ideally like to use) to support their applications. The results of each periodic review should be published, with further, bespoke information as follows being published:

- A check-list, which would be updated as more information is received, as to the types of information connecting parties may require in support of an application
- Where information has been sourced from, with a view to identifying ways to improve the process for sourcing (and the quality of) that information, which may include Western Power or another relevant party (e.g., AEMO) publishing or otherwise making that information available through a more formalised, mechanistic approach.

Better allocation of commercial risk between Western Power, the Applicant and AEMO

Apart from one exception[35], the Certification of Reserve Capacity currently requires "*evidence of an Arrangement for Access or evidence of the Market Participant has accepted an Access Proposal*" (s4.10.1), and the WEM Rules state that capacity credits can only be applied for two years in advance (s 4.11). In short, new projects need to obtain a grid connection agreement before they can apply for capacity credits that **commence two years** later.

This exacerbates the overall "timing" issue associated with getting a new generator connected, as most projects will not reach FID until they have capacity credits secured, which in turn is a precursor to a new generator being built. Put another way, the longer the timeframe for securing capacity credits extends beyond the time required to get a connection agreement, the longer the duration between a generator entering the connection process and it finally connecting to the transmission network and generating electricity for end customers to consume.

More generally, any uncertainty around the future level, timing or value of capacity credits increases the risk to developers and their ability to achieve FID.

All-in-all, the 2-year waiting period to receive capacity credits unnecessarily delays new projects, creates investor uncertainty (e.g., who knows what the capacity price will be in 5-10 years?), and threatens to exacerbate the capacity shortfall.

Conceptually, there is a trade-off between the certainty that a generator will be generating and providing services that underpin the right to receive capacity credits in the first place, against the financial implications that a two-year wait period imposes on that generator. In light of the current situation facing WA, it is likely to be more beneficial to weight that trade-off more towards the generator applying for a connection, as opposed to certainty of its availability (which in turn is a risk borne by the broader consumer base). That said, the current approach, which in theory seeks to de-risk the process from the consumers' perspective, in fact, increases the risk that not enough generation will be built in time to either limit shortfalls, or meet the WA Government's broader decarbonisation objectives, both of which would also impact WA consumers.

As such, we would recommend removing the rigid two-year timeframe underpinning the setting of the Certified Reserve Capacity, and rather, prescribe that capacity credits 'amounts' can be pre-approved prior to the "*evidence of an Arrangement for Access…",* subject to certain conditions being met, for example it must be up to a certain phase of the connection process to be eligible (e.g., the Project Planning phase). This will provide more certainty to projects that are likely (but not guaranteed) to proceed through to an access offer, without imposing significant additional levels of risk on the broader community (by paying for a capacity service that is not otherwise made available).

35 The exception is the "Conditional Certified Reserve Capacity".

2.3.4. Ensure alignment with the development of the shared transmission network (including any Priority Projects)

Any network connection process relies on there being a robust, credible, shared transmission development plan being available to inform proponent decision-making (see next section for more information on this). This allows:

- Proponents to, within their own development planning process, prioritise sites that are sequential to, or aligned with, the transmission development plan; and
- Proponents to self-select 'premium' applications that are aligned with that transmission development plan, resulting in Western Power devoting its connection-related resources to those projects that customers self-select as representing their best options.

As we will elaborate more on in the next section, the relationship between the connection process and transmission planning is two way - a robust connection policy is a pre-cursor to the development of a robust transmission development plan. Absent this, the generation that underpins the transmission development plan is more likely to be delayed, inefficient, and/or mis-aligned with the plan, if an inefficient first-in, first-served approach continues to be adopted. This is because this approach disassociates the connection process (in particular, how connections are prioritised) from the planning process.

3. Transmission Planning

3.1. Background

In its simplest form, transmission planning deals with the location, timing and size of transmission assets including transmission lines and cables, switchgear, and transformers. Planning should account for the time to identify, acquire and permit easements, time to construct, and costs. Transmission assets are expensive with high capital costs, have long construction lead times and long economic life, are essential for conveyance of electricity from generation to customers and can have significant social licence impacts. The availability of future transmission and of its likely capability to support investments is a significant factor for investors. Unnecessary uncertainty about future transmission reduces the credibility of a power system as a destination for investment. Robust and defensible transmission planning is therefore important.

In saying this, transmission planning has, and will become even more, complex in the future, reflecting the implicit shift away from what has traditionally been an incremental, 'developer-led' approach, whereby individual developers sought connection and, where needed, new network has been developed, to a more centralised, plan-led approach. This shift is inherent with the WEM rules which already includes an option for Ministerial determinations relating to Priority Projects. The shift is more complex than nominating a Renewable Energy Zone (REZ) location where additional transmission will be unavoidable. The shift recognises that large shifts in the geographic distribution of supply and possibly demand are difficult to assess on a project-by-project or incremental basis and a holistic analysis is needed. As such, knowledge of location, timing and size of generation sources and demand are even more critical inputs under a plan-led transmission planning approach.

Planning is a forward looking activity, and these inputs are dependent on forecasts of willingness to invest and consume at a location which in turn are in part dependent on forecasts of costs and charges for related network facilities.

These forecasts inevitably involve uncertainty that can result in higher reliability and costs or alternatively lower reliability and costs than justified based on the value to end users of different levels of reliability and security of supply.

Transmission planning therefore involves multiple and often interacting trade-offs and expertise in engineering, economic, financial, socio-economic and environmental factors.

A logical (and traditional) approach to network planning is to start with data on:

- expectations for demand and generation including options for customer self-supply
- uncertainty around timing of requirements/future developments
- the existing network, which naturally forms a sunk cost starting point for any expansion
- objectives relating to cost effectiveness and reliability of supply
- policy 'guiderails' such as environmental impact statements, emissions
- capital and operating cost of new developments

These data are used to assess options for how to meet demand and accommodate connection and operation of new generation in the most efficient manner.

Uncertainty around future needs is often addressed by considering different levels and profiles of demand and costs over the full planning horizon. Uncertainty should also consider options that provide flexibility to respond as more information becomes available and would allow staged expansions, with each stage designed and developed only when and if justified at the time, which to be clear, is not the same as a single design that is constructed over time.

Cl 4.5B of the WEM rules prescribes the requirements for transmission planning in the WEM and broadly aligns with this approach.

The WEM rules also include a requirement that planners must take account of government policies specified in the Whole of System Plan (ref cl 4.5B5 (e)) which may influence forecasts of both generation and demand.

In the remainder of this chapter, we present our observations and our views on possible improvements.

3.2. Observations and recommendations

3.2.1. There needs to be a credible transmission development plan and planner

One of the factors that initiated our work was the significant difference between the two very recent plans that investors have looked to for forecasts of the need for transmission development in WA:

- The SWIS Demand Assessment (SWISDA), produced by EPWA in May 2023, and
- The Whole of System Plan (WOSP) last published in August 2020.

The SWISDA reported that 4000km of new network would be needed by 2042 whereas the WOSP forecast almost no new transmission being needed – a stunning difference between the two plans in what was a relatively short time period.

That said, our assessment of the forecasts for both generation and demand in the two reports lead us to the observation that these were so different that it would be surprising if the outcome for network requirements in the SWISDA was not significantly greater than in the WOSP. We are unable (and were not requested) to comment on whether the quantum of 4000km of new network in the SWISDA is justified as there is too little information in the SWISDA to inform an independent assessment. However, we also note the SWISDA was effectively a single point analysis with no reported consideration of uncertainty and no reported consideration of willingness to invest or to consume, including no note of which party should expect to pay. These factors can be critical in forecasting generation and demand.

Our view is that, for these reasons, the SWISDA, as published, is likely to:

- **Lack credibility in the eyes of investors:** The opaque and ad hoc nature of its development, the (apparent) lack of any assessment of customers' willingness to pay for transmission services, the lack of scenario analysis, along with the vastly different projections it contains as compared to the preceding report that investors would have been most aware of, the WOSP (without a very clear description as to what drives the differences), is likely to undermine the credibility of the SWISDA and therefore the SWIS in the eyes of investors, and therefore, as a destination for investment, which is clearly an unwelcome situation; and
- **Risks creating a perception of Government overriding the formal network planning role of Western Power:** Western Power, which as described earlier, is charged with undertaking transmission planning in accordance with the WEM Rules, appears, on the face of things[36], to have been excluded from the transmission planning process. This unexplained change in who is undertaking transmission planning reduces the credibility of the planning process more broadly, and increases the risk to investors contemplating an investment in the SWIS.

36 We say this noting conflicting advice we received during this work that Western Power was involved in preparing the SWISDA while the AEC was told by Western Power's executive team that they were not involved.

In relation to the latter, this is not to say that Government should have no role in the development of the transmission system. Government and its agencies have a legitimate and vital role to play in developing and promulgating policy and potentially identifying location, timing and size of both generation and demand (including accounting for willingness to invest and consume). As noted previously, these are crucial inputs to the network planning process. However, critically, assessing the implications for network development due to demand and generation projections should remain with the appointed network planner.

In summary, we consider that:

- **Investors are unlikely to consider the SWISDA to be a robust network development plan:** Moreover, its creation is likely to have increased investors' perceptions that the Government is overriding the formal network planning role of Western Power – a situation that, everything else being equal, is likely to diminish investors' appetite to invest in the SWIS. We understand the SWISDA has now been repositioned as a 'vision' rather than a plan[37], potentially in response to this perception.
- **There should – always – only be one authoritative source of network planning**: To do otherwise creates uncertainty in the planning arrangements, which increases the risk to parties contemplating making investments in the SWIS. In our opinion, Western Power, the asset owner, is the logical body to continue in this role. Government may, however, be minded to consider the creation of a new and independent planning body as is the case in a number of other jurisdictions. [38] This would be a significant change that should only be adopted after careful consideration, and if adopted, publicly explained to reduce any residual uncertainty that might otherwise be created within the investor community. In saying this, the most important thing is for such a body to be seen by investors as being a credible planning authority. This will be the case if:
  - That body is independent (particularly given the mix of public and private ownership of existing generation and likely, future generation, in WA);
  - It demonstrates that it has the necessary skills to undertake the complex task of planning an electricity transmission system (particularly in the context of the broader energy transition happening in WA), which may be even more challenging in a relatively smaller industry sector (e.g., as compared to the NEM);
  - There is a robust development and review process, for example, planning processes that are transparent and subject to input from stakeholders and, in certain circumstances, able to be reviewed, presumably as is the case now, by the ERA; and
  - It uses consistent and robust approaches, processes and methodologies.

We note that in the later stages of preparing this report Government announced the formation of Powering WA. The principles summarised above are therefore highly relevant to how this new body is structured and operates and interacts with Western Power, the ERA and incumbent and future stakeholders.

37 Commentary in industry interviews undertaken for this report. The AEC advised that Western Power's CEO made these comments at the 2023 Energy in WA conference

38 For completeness we note the model that has operated in Victoria from the start of the NEM whereby planning and asset ownership are functionally separated with AEMO-Vic undertaking planning and AusNet Services is the predominant owner. More recently, other jurisdictions are also adopting similar arrangements in relation to renewable energy zones although the TNSP asset owner has previously also undertaken planning.

- **Charging and cost-recovery mechanisms for transmission investments should be clarified:** Regardless of whether planning is developer-led or plan-led, charging and cost-recovery mechanisms should be clear and applied equitably to all connecting projects (in order to create a level playing field). In the case of a plan-led approach, clear articulation of the charging arrangements upfront is necessary in order for the planner to be able to place any credence on the demand and generation projects that are proposed/forecast. . In the case of a developer led approach, charging arrangements should be available to potential developers to allow them to make similar assessments.[39] Given the rapid transition of the electricity sector that is envisaged, charging and cost recovery arrangements, if necessary, should be reviewed and amended as soon as possible, so there is clarity around who pays for what transmission and on what basis, ensuring that any assessment of customers' willingness to pay for those transmission services reflects their future financial exposure. For example, the recent proposal to allow for proponents to contribute $100,000/MW towards funding of new transmission is a case in point which may be justified in some cases as a means to identify willingness to pay for access especially in a developer-led arrangement but less so in a plan-led regime. Absent this, information provided by customers as part of the development of any transmission development plan regarding their likely future demands will have limited value, which in turn increases the risk to investors of making investment decisions on the basis of that plan [See next section for more details on this].
- **A credible transmission plan needs to be maintained/produced**: For investors to consider a transmission development plan to be credible, there needs to be certainty regarding:
  - When a transmission plan will be produced, how often it will be revised, the criteria against which a re-opening of the plan would be assessed (e.g., a plan will be updated in the event of X), and what protections will be afforded to investors who have initiated connection activities on the basis of a previous plan – which also links with commercial risks of dispatch congestion
  - The process for its production, and that that process is transparent
  - How Government policy has been reflected in that plan
  - How real options analysis[40] has been accounted for in the planning process, in order to account for risks large projects may proceed at a slower pace, not at all or with evolving designs
  - The scenarios (or the criteria that underpins the development of scenarios) that need to be tested in the plan
  - How the plan integrates with, and is supported by, a robust transmission connection process [See next section for more details on this].

39 Noting that the specific mechanisms that should be adopted are beyond the scope of this paper.

40 A 'real options' analysis is simply a way of applying option valuation techniques to real-world investment decisions.

3.2.2. Clarity of approach to network planning within regulatory instruments

As alluded to earlier, we believe that there needs to be an acknowledgement that, like many other electrical systems, the SWIS is facing a fundamental change in how transmission is planned, with it moving from a developer-led to a plan-led approach. Whilst competitive reforms saw the successful introduction of disaggregated customer and investor-led processes for transmission planning (and many other industry activities), these processes are struggling to keep pace with rapid transition to high levels of renewables and reducing emissions. The WOSP, and the NEM's equivalent, the ISP, as well as similar processes in other markets, represent a shift to more centralized processes. Our view is that this shift should be explicitly acknowledged in government, regulatory and Western Power publications to provide greater clarity to investors. Further to this, we note the following:

- The explicit adoption of plan-led development building on the WOSP would be a natural evolution of WA arrangements and consistent with approaches being taken elsewhere[41]. Whilst Western Power and EPWA are already moving in a similar direction and where they are aligned with each other and with connection processes, this is positive. We do, however, consider that explicit attention should be paid to reconciling overlap between developer-led and plan-led approaches within the rules and codes of a market, and the construction of regulatory instruments should be simplified to recognise that central network planning has effectively replaced planning based on developer intentions. This includes ensuring that the transmission connection process is designed in a way that aligns with the development of a plan-led transmission plan (See next section for more information);
- This underlying principle should result in shorter and more focused planning. The technical fundamentals of identifying preferred network developments, that is the technical analytical processes, are unlikely to need to change, however the development of inputs will.
- The choice of approach is a trade-off. Plan-led arrangements risk inefficient outcomes due to central planner conservatism and developer-led planning risks inefficiency due to incremental development and potential loss of scale efficiency. The speed of transition has 'moved the needle' in favour of a plan-led process. However, implementation detail is important either way as inefficient network developments eventually result in higher charges to customers.
- Clarity of process should be supported by defensible and robust principles for matters such as queuing and charging – or more generally who pays. A recent proposal to allow for proponents to contribute $100,000/MW towards funding of new transmission is a case in point. Developer contributions can be justified in some cases as a means to identify willingness to pay for access especially in a developer led arrangement but less so in a plan-led regime which, as noted, is the direction of recent changes in WA and elsewhere. This situation highlights the need for considerable care in designing new arrangements that are fit for purpose, create a level playing field across different connecting parties[42], and minimise the risk of inadvertent perverse outcomes.

41 In the NEM a similar change is occurring through the Interconnected System Plan (ISP) and identification of actionable projects which result in reduced assessment within the NEM RIT-T. Some NEM jurisdictions are pursuing similar strategies, for example in Queensland a current bill being considered by the Queensland Parliament quite explicitly limits access to generation facilities consistent with a central plan. Internationally, in the Irish market this shift is very conscious and is being described as changing from developer- led to plan-led.

42 For example, if proponents that benefit from projects selected by the Minister as being Priority Projects are not required to contribute $100,000/MW, whereas all other project proponents must, then this creates an uneven playing field and may risk incentivising inefficient outcomes.

3.2.3. The transmission development plan needs to be informed by a set of credible inputs

When it comes to transmission planning, uncertainty about future requirements is inevitable, however, the greater that uncertainty, the greater the risk that a plan reflects (and an enacted plans adopts) inefficient outcomes. The corollary is that mechanisms that narrow the level of uncertainty are often included in market designs, including in the WEM.

These mechanisms include queuing for connection, the New Facilities Investment Test, LTPASA, the Reserve Capacity Mechanism, the WOSP, the ESOO, Access Applications and Western Power's Transmission System Plan. There is also the proposed ROI process, which is seeking registrations of interest from large commercial and industrial users on their plans for low-emissions electricity and renewable energy projects to supply major projects in SWIS.[43]

These inform how various changes in the generation fleet and the level (and location of) demand are handled currently and, as alluded to, further mechanisms are under development primarily through updates over time.

A particularly important mechanism is the WEM RCM, which creates a strong incentive for accurate information, but only for the RCM horizon, which is significantly less than the development time for transmission. The LT PASA requires notification of future generation capability for 10 years but does not define requirements for accuracy or confidence. Presumably bad faith statements of future intentions may be inhibited by requirements for compliance with WEM rules, but it is likely to be difficult to prove non-compliance.

In summary:

- **Strengthening the notification of intention to connect:** While the WEM has several mechanisms that require potential new entrants to notify their intention to connect and therefore potentially create a need for new network beyond the horizon of the RCM, there is little certainty beyond the RCM horizon. We consider there would be benefit in strengthening the criteria for inclusion in the mechanisms beyond the RCM which increase certainty – the NEM commitment criteria, which includes several key project milestones including acquisition of land, major contracts for services and equipment, permitting, finance and construction programs would be a useful starting point in this regard[44].
- **Increasing certainty around new generation and load entrants:** Increased certainty around future generation and load entrants will assist Western Power (or whoever is charged with undertaking transmission planning) to prepare more robust longer-term assessments of supply and demand and network plans. This will mean potential investors have a clearer view of likely network development and thereby reduce risks and costs for prospective new entrants. This certainty must encompass both demand and generation, both of which are discussed below:

43 https://www.wa.gov.au/government/media-statements/Cook%20Labor%20Government/WA-Government-seeks-interest-on-industry-decarbonisation-plans-20231004

44 See ESOO input information at AEMO | Generation information. Background Information tab for each region, Project Commitment Criteria.

- **Robust forecasts of demand, underpinned by customers' willingness to pay for transmission services, need to be adopted**: The ROI process is said to provide industrial customers an opportunity to submit their project plans, status, timing, and willingness to contribute to network augmentation and connection costs. We are firmly of the opinion that a robust process for identifying customers' willingness to pay for transmission services is at the forefront of developing a robust, credible, set of demand forecasts, which in turn are fundamental to the development of a robust, credible transmission development plan. This is all the more important where the footprint of the network may need to be extended significantly to service new demands, and where those customers are likely to have (potentially) economically feasible alternatives to a transmission network connection (e.g., behind-the-meter solutions; micro-grids).
- **A robust forecast of generator connections:** A robust connection policy is a pre-cursor to the development of a robust transmission development plan (and vice versa). Absent this, generation may be delayed, inefficient, and/or mis-aligned with the plan. Our proposed approach to facilitating a more efficient connection process, which, amongst other things, would allow parties to pay for a premium connection process, would logically lead generation proponents to focus their resources on applications that are aligned with the transmission development plan, assuming they consider it a robust and credible plan. It is also designed to provide more certainty around connection timeframes, a fundamental driver of a robust transmission development plan.