

Western Australia Renewable Energy Transition Survey

Headwinds and Barriers

**Maywood and Partners Management Consultants
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Survey Report

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1 Executive Summary

The purpose of this report, prepared by Maywood and Partners Management Consultants, is to document the findings from a survey of the Western Australian renewable energy industry.

The confidential survey sought feedback from industry participants on the WA clean energy transition to understand the extent and nature project development of headwinds and barriers.

Survey participants were a representative sample drawn from renewable energy project proponents, Gentailers (electricity generators and retailers) and industrial gas users decarbonising primarily via electrification.

The survey results show that there are significant obstacles that need to be addressed in order for the state to meet its published renewable energy targets in a timely manner. As data in **Figure 2 – WA RE Capacity Growth to 2023** indicates, and feedback from respondents confirms, there is a slowing down of South West Interconnected System (SWIS) connected RE projects reaching final investment decision and coming online in Western Australia, excluding rooftop solar and large-scale battery storage.

This contrasts with the official position of the WA state government in recent communications (WA Government, 2023) that have set the expectation there are a large number of renewable energy projects in the pipeline.

Renewable Energy projects in Western Australia – both entering construction and operation – have flatlined in recent years, despite the WA Government's own modelling showing we will need 50 gigawatts of new renewable energy to come online by 2042.

This 50GW of new renewable energy generation translates to 63 times the amount of current large scale solar and 16 times the amount of currently installed wind capacity. For further context, the amount of renewable energy installed over the last 20 years is around 1.2 gigawatts of large scale solar and wind.

This survey highlights significant differences in opinion between the government's position on the energy transition and that of the renewable energy industry.

The Government's stated position is that there are a huge number of renewable energy projects currently in the pipeline facing no significant barriers to approvals, construction or full operation. Conversely, the industry representatives interviewed for this survey have identified significant challenges for renewable energy projects in Western Australia that can't be voiced due to the political nature of the transition and a universal fear that voicing these concerns may harm future prospects.

It is abundantly clear that to ramp up renewable energy on a scale that is needed by the government's own forecasts requires an urgent and dramatic shift in government policy. Hopefully, the recent announcement establishing the PoweringWA entity within the Department of Energy, Mines, Industry Regulation and Safety is perhaps a recognition that a business-as-usual approach is not adequate for the urgency and size of the task ahead.

The survey also highlights concerns around critical infrastructure funding and planning. Whilst there has been some additional funding announced for South West Interconnected System (SWIS) transmission upgrades, the survey highlights that the overall approach in terms of planning and

funding of critical renewable energy infrastructure is unclear and causing uncertainty in the market and within the broader community.

The proposed 'user pays upfront' model for critical infrastructure was not supported by most industry respondents nor does it have parallels in other comparable jurisdictions. The current Whole of System Plan (WoSP) or the SWIS Demand Assessment does not contain the level of detail industry is seeking, and policy clarification on funding of critical infrastructure is urgently required.

The recently announced WA renewable energy hubs in the Energy Policy WA SWIS demand assessment report were also seen by industry as insufficiently defined to develop investor confidence. Feedback was that when other governments announce renewable energy zones (REZs) they come with an implicit set of expectations around co-investment and other government support. The NSW REZs (EnergyCo NSW, 2023) provide a typical example that is providing industry with the critical infrastructure needed to invest with certainty in projects.

Conclusions from the survey are presented in Section 5 and the summary of recommendations presented below.

Recommendation 1. Establish a WA multi-agency clean energy transition authority with the necessary legislated directive powers to plan, coordinate and facilitate the energy transition at a state level.

Recommendation 2. Scope (and publish that scope) and fund common user critical infrastructure for the clean energy transition.

Recommendation 3. Establish WA Renewable Energy Hubs utilising best practice.

Recommendation 4. As a means of fast-tracking network connections, Western Power accelerates its plans to enable the timely connection of critical projects. Ensure that the Western Power major customer critical project status and application process is transparent and fair and reflective of best practice.

Recommendation 5. Review and update Energy Policy WA and AEMO energy models to reflect the economic and technical value of a generation source (such as Offshore Wind) and not just the OPEX and CAPEX costs.

Recommendation 6. Review and update Energy Policy WA and AEMO energy models to show the integration of process heat for existing major industries and the impact on electricity demand, renewable energy spilled energy optimisation and forecast gas use for decarbonisation via electrification.

Recommendation 7. Establish a joint WA industry-government industry decarbonisation working group to look at practical application of decarbonisation pathways such as, or specifically process heat.

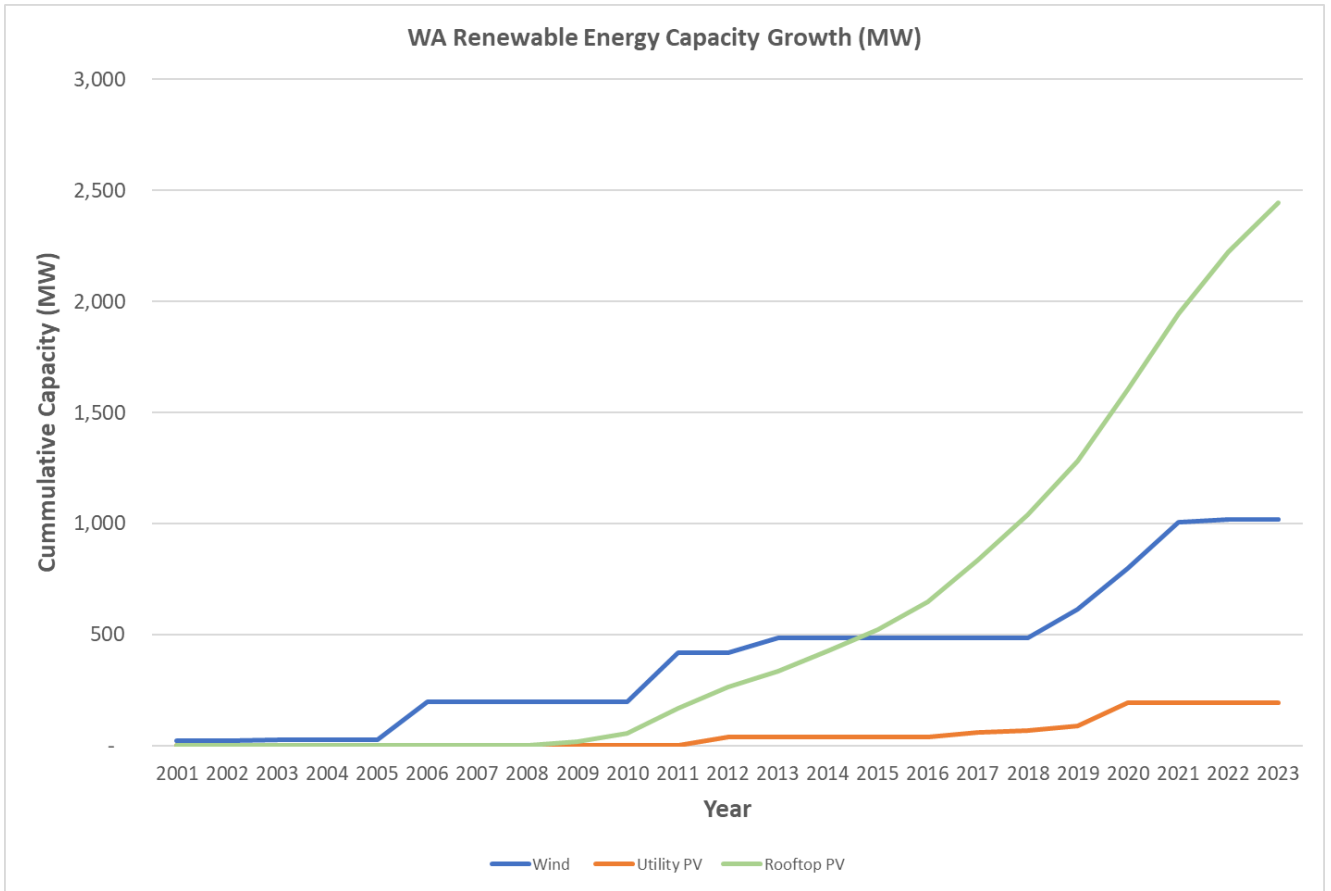


Figure 2 - WA RE Capacity Growth to 2023

2 BACKGROUND AND OBJECTIVES

Under state and federal legislation and the Western Australian (WA) Climate Change Policy (DWER, 2023) the energy sector is undergoing a significant change to rapidly decarbonise.

Individual companies, both energy generators and consumers, are developing and executing their decarbonisation plans.

New market participants are entering the WA energy market offering renewable energy solutions.

Whilst the WA state government, the bureaucracy and related energy agencies have achieved a number of significant energy related goals, questions have arisen about the pace and direction of the clean energy transition.

The inaugural Whole of System Plan (WOSP) (Energy Policy WA, 2022) covering the WA Wholesale Electricity Market (WEM) for the South West Interconnected System (SWIS) was launched in October 2020. The plan has subsequently been largely superseded by:

- WA State Government Collie coal closure announcement published 20th June 2022 (Department of the Premier and Cabinet, 2023);
- Energy Policy WA SWIS Demand Assessment published in May 2023 (Energy Policy WA, 2023).

The SWIS Demand Assessment noted, under the Future Ready scenario, more than 50 GW of new generation and storage capacity would be required to supply load growth in the SWIS by 2042 as shown in **Figure 1** below.

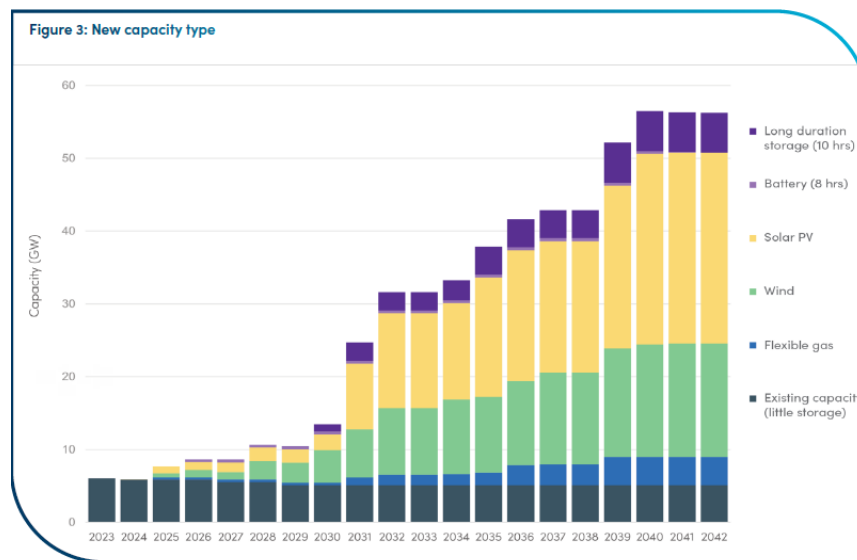


Figure 1 - SWIS DA Future Ready Scenario

To provide some context for the scale of that task, the historical growth of WA Renewable Energy (RE) generation sources in MW is shown in **Figure 2** below.

Whilst there are some RE projects currently in construction and commissioning (e.g. the Flat Rocks Wind Farm) the number of projects reaching Final Investment Decision (FID) has tailed off in recent years as shown in **Figure 2** below.

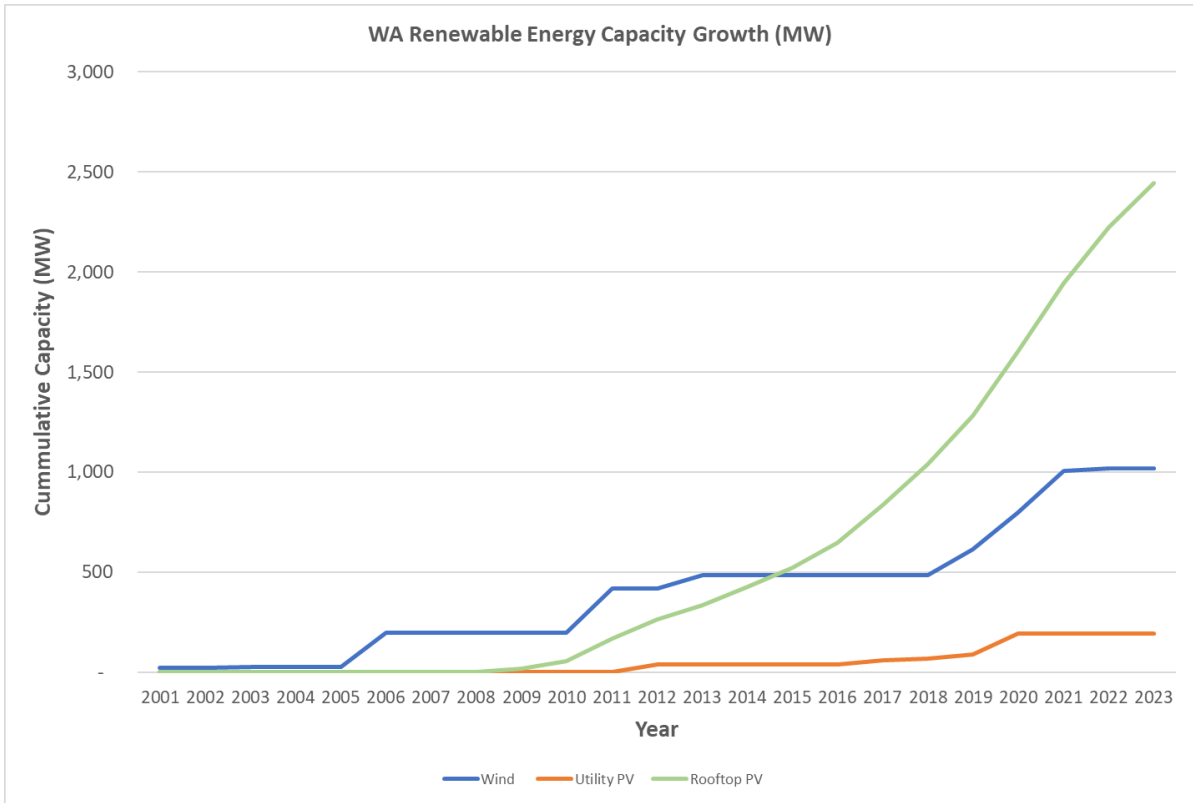


Figure 2 - WA RE Capacity Growth to 2023¹

The objectives of this survey were to solicit confidential feedback from industry participants on the WA clean energy transition in order to positively influence state and federal policies to accelerate the transition to renewable energy.

The survey did not address:

- Macroeconomic issues impacting the WA renewable energy transition such as inflation, interest rates, post pandemic recovery, European war, supply chain impacts, skills and housing shortage, supporting services (ports, roads etc); and
- The WA Wholesale Electricity Market (WEM) market structure, regulatory and governance frameworks.

¹ Source: Public data (Wind and Utility scale PV) and the Clean Energy Regulator (Regulator, Clean Energy, 2023) (Rooftop PV).

3 SURVEY METHOD

The survey covered a representative sample from:

- Renewable energy project proponents;
- Gentailers (electricity generators and retailers);
- Industrial gas users decarbonising primarily via electrification

The survey questionnaire contained in Appendix A was used in face-to-face, on-line or telephone interviews with the respondents.

Respondents and the completed questionnaires are confidential in order to protect individuals and the interests of the companies they represent.

A total of twelve companies were contacted to take part in the survey with seven companies participating. One questionnaire was completed per company.

4 SURVEY RESULTS

The interviewer collected the following types of data:

- Qualitative data including participant comments.
- Quantitative data including ranking metrics.

The following sub-sections summarise the question responses, without differentiating the nature of the respondents (i.e., project proponents, Gentailers, energy users) or individual respondents in the feedback.

Individual question responses are provided in the following sub-sections. Survey questions are provided in full in Appendix A.

Note: Survey Question 1 is an identification reference, hence questions in the following section start at Question 2.

4.1 Question 2 WA Energy Transition Plan

Respondents were asked:

Is the WA energy transition plan sufficiently coherent, transparent and well communicated to industry stakeholders and the wider community?

Majority of the respondents indicated No as indicated.

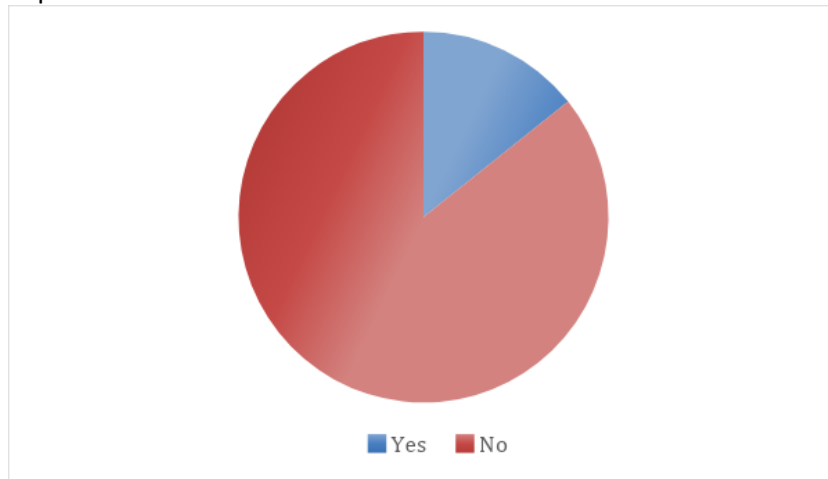


Figure 3 - Question 2 - WA Energy Transition Plan

Feedback on the transition plan is below. Overwhelmingly the view held by industry was that the WA energy transition plan is NOT sufficiently coherent, transparent and well communicated.

*“Plan seems to be organic and made-up on the go.
The end goal is defined as aspirational however the pathways, the costs, who bears the cost is unclear.”*

*“The energy portfolio is big and the energy transition is a huge challenge – the current Minister has Mines and Petroleum; Energy; Hydrogen Industry; Industrial Relations.
Also needs the EPA onboard so the plan is consistent across government”*

*“From the WOSP to the SWIS Demand Assessment to Western Power’s Transmission System Plan
it’s hard to tell if the variance between the plans is due to a different basis of underlying assumptions, or a lack of cross agency coordination”.*

*“The vision is there but the plan is missing.
State coal closure announced but clear that Synergy will be short of energy.”*

*“WoSP was a waste of time
SWIS Demand Assessment – vision clear but missing the important elements of who is funding and when will it will be built
Transmission is key”*

*“Transmission build out, scope, schedule and funding are unclear
Offshore wind not modelled in SWIS DA”*

The only exception to this was that of one respondent who largely repeated the government position:

*“Plan is clear, transparent and the government intentions are clear.
Positive private sector response to the AEMO Non-Co-optimised Essential System
Services (NCESS) procurement process for Reliability Services to commence on 1
October 2025 with a two-year duration indicates that industry is supportive.
What we expect to do is sufficiently clear and communicated well”.*

*“There is apathy in the community and more work needs to be done to
communicate more broadly”.*

“Lack of interim targets”

4.2 Question 3 Type of Project Being Developed

The respondents were asked the type of project(s) being developed:

1. Wind - Offshore
2. Wind - Onshore
3. Utility scale PV
4. Battery Storage
5. Hydrogen
6. Supply / supply upgrade - existing plant decarbonisation
7. Thermal storage

This question helped frame responses to subsequent questions.

All categories were covered in the survey responses.

In addition to the standalone Battery Energy Storage Systems (BESS) under Option 4 above, BESS was being considered by respondents in combination with Options 1, 2, 3 and 6 above.

One respondent noted:

“BESS (Battery Energy Storage Systems) provides the reactive plant to meet technical rules and an asset that can be traded on several markets. Alternative is capacitor banks or syncons (synchronous condensers) which make the project uncompetitive. These are never used in practice. Needs some rule changes to support this innovation (Energy Policy WA, AEMO others).”

4.3 Question 4 Project Development Duration

Proponents were asked how long their project(s) had been under development.

This question established how far along they are in the overall development cycle and to provide some context for any delays they may have experienced.

'Project development' for the purposes of the survey was taken to be from pre-feasibility through to first power.

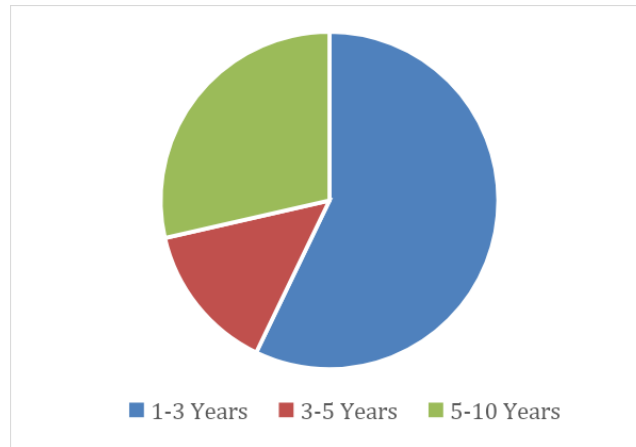


Figure 4 - Question 4 - Project Under Development Duration

For context a typical renewable energy project takes around 7 years with 3-4 years pre-Final Investment Decision (FID) and 3-4 years post FID up to first power.

4.4 Question 5 Project Delays

Respondents were asked:

Has your project suffered delays due to longer than expected project development activities?
Rank the following list in importance.

'Delay' was defined as a period of time by which something is late or postponed beyond the original time frame agreed between the proponent and the respective agency.

1. Investor uncertainty related to level of government support
2. State or Federal approval process
3. Stakeholder engagement
4. Western Power related
5. AEMO related
6. Land access
7. Environmental consents and approvals
8. Aboriginal, heritage or other related approvals
9. Other

The majority of respondents had suffered delays as indicated for a variety of reasons as discussed below.

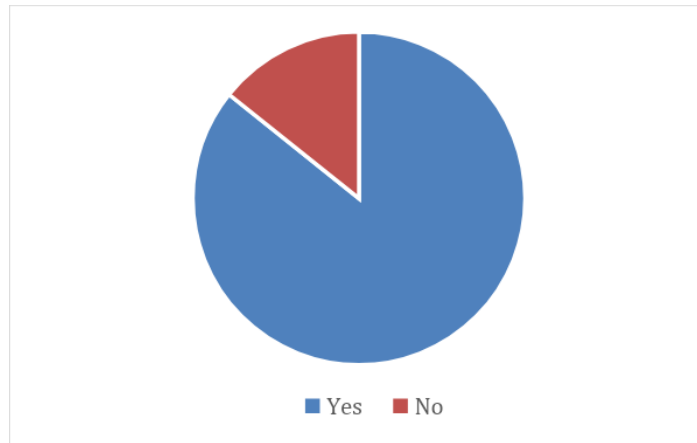


Figure 5 - Question 5 - Project Delays

Offshore Wind (OW) proponents noted that State and Federal development process for OW is emerging and noted:

“The approval system for offshore wind has gaps. No bilateral agreement between State and Federal to help with the approvals process, i.e. a single submission. “

They and others noted that:

“Policies to incentivise renewable energy, e.g., via the Reserve Capacity Mechanism (RCM) are unclear at the moment.”

“WEM (Wholesale Electricity Market) capacity mechanism complexity and on-going changes that make it too complex for investors to understand which increases how risk is priced”. Another respondent noted “investors are not attracted to uncertainty”.

These issues led to the option **“Investor uncertainty related to level of government support”** being ranked the number one issue for proponents.

Western Power **“Major customer connection delays”** have been reported in the media and recognised by political parties, clean energy advocates (SEN, 2023) and Western Power (Western Power, 2023). Western Power related delays was the number two issue for proponents.

Whilst Western Power network access arrangements have recently changed to a constrained network access model which represents both an opportunity and risk for investors, one proponent noted:

“Western Power has been better from a network capacity forecast perspective. Feedback from other jurisdictions where network access is granted only to find the asset sometimes can’t operate due to network constraints.”

Western Power is developing a framework for assessing and identifying a critical project based on a set of principles and criteria including a project's criticality to the State and a customer's readiness to connect (Western Power, 2023) - feedback on this initiative is addressed in Question 15.

Proponents seeking to decarbonise existing plant operations via electrification noted delays due to availability of suitable technology. This included thermal storage, Australian Standard certified electric boilers or heat pumps at suitable scale.

4.5 Question 6 Development Concept Changes

Respondents were asked:

Did your preferred project development have to be significantly changed to comply with a technical or regulatory requirement that seemed incompatible with the nature of the energy transition?

The majority of the respondents voted No with respondent feedback noted below.

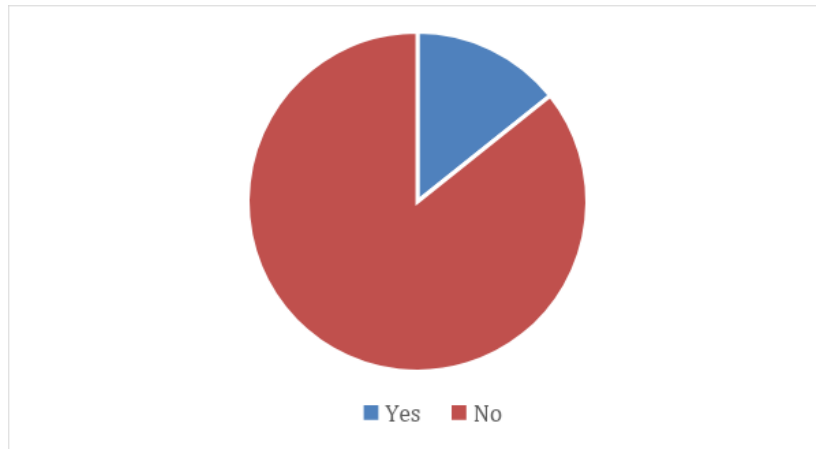


Figure 6 - Question 6 - Project Development Changes

“Offshore wind needs larger projects to be economic, typically, 1-2 GW which is a challenge to the SWIS. This is largely the ‘N-1’ risk and related restrictions around the largest single generator allowed on the grid. Industry decarbonisation from large gas users will require larger generation capacities”.

Another respondent highlighted the environmental challenge facing authorities and environmental NGOs with the need to both rapidly decarbonise and at the same time manage environmental impacts from new projects:

“One possible option to partly rehabilitate mined land for use as wind turbine sites with access roads wouldn’t be seen under current legislation by the EPA as a less valuable outcome compared to a fully rehabilitated site. The world needs renewable energy, otherwise there will be nothing to rehabilitate.”

Managing evolving technical standards including Generator Performance Standards (GPS), grandfathering of standards, level of risk and cost of risk controls (like syncons) were all raised by respondents:

“WP connection process has improved recently. Generator Performance Specifications are technically challenging.”

“GPS are evolving over the years and needs some further work. Developers are gun shy from East Coast experiences which may not be the same level of issue in WA”.

4.6 Question 7 Benchmarking with Other Jurisdictions

Respondents were asked:

Do you have operating assets in other jurisdictions / how does the WA project development /network connection process compare with those jurisdictions?

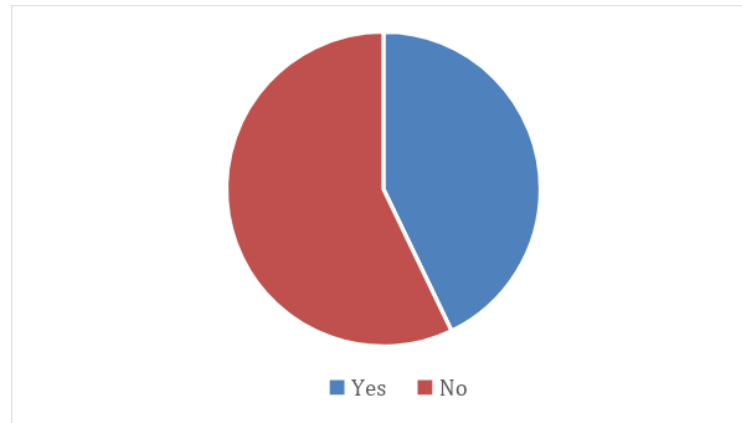


Figure 7- Question 7 - Jurisdictional Benchmarking

Respondents with international and Australian experience provided insights:

“Often in Europe the state does the front-end feasibility and stakeholder engagement to de-risk the projects and those costs incurred are then recovered through licence fees.

In WA the risk is all with the developers, including site locations within a designated development zone, and the stakeholder engagement after the initial consultation process. The risk is held by the developer for longer with considerable costs incurred and no certainty of outcome.”

“Other jurisdictions within Australia are harder but WA is becoming harder, e.g., AEMO and the Generator Performance Standards and other technical standards, changes to WP Generator Interim Access (GIA) arrangements for a contested network all makes things harder and riskier for developers.”

4.7 Question 8 WA Energy Transition Ranking

The respondents were asked to rank their WA energy transition experience from 0 (extremely poor) to 10 (extremely good). As shown in the figure below, the average score was 6.1 with the lowest score 3 and the highest score 9.5.

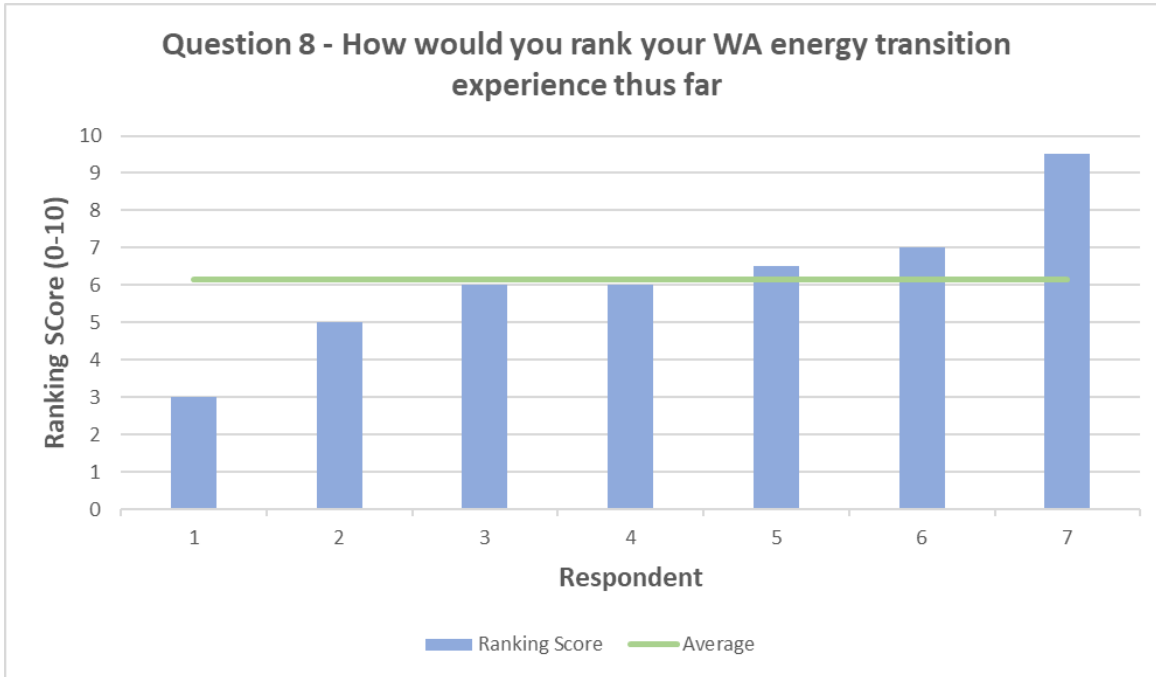


Figure 8- Question 8 – Transition Experience Ranking

The reason given by the respondent for the lowest score was:

“Lack of clarity, support structure, lack of investment in critical infrastructure, overall process much slower and expensive than expected with respect to other comparable Western countries, and Victoria”.

The reason for the high score was:

“The market led policy adopted by the previous LNP state government has been replaced by Labor in 2017 and seen the dial shift with coal closure and significant taxpayer investment.”

Those around the medium commented:

“Positive engagement with government agencies and Western Power and consultation balanced against the lack of a clear costed transition plan”

“Whilst there are absolutely road blocks, the State Labor government understands the issues and are addressing them, albeit more slowly than required.”

4.8 Question 9 WA Energy Transition Authority

The respondents were asked:

What are your thoughts on a WA clean energy transition authority Energy Policy WA "facilitation vehicle" and now PoweringWA) to accelerate the transition? Would a multi-agency (Energy Policy WA / Western Power / AEMO / AER) authority charged with accelerating the transition be effective / useful?

Does the EPA and other agencies such as state development need to be involved given the scale of the task ahead outlined in the SWIS DA?

All respondents were positive about the PoweringWA initiative with many noting that details are emerging and that PoweringWA will be a group within DMIRS. Feedback included:

*"Hopefully yes, noting that PoweringWA is not multi-agency.
A one stop shop would be handy."*

*"PoweringWA is a step in the right direction,
subject to understanding the terms of reference and their performance.
The more efficiencies than can be generated across multiple agencies would
be useful
Currently applying for lead agency status (major project status) which
hopefully will assist"*

*"Yes – very important to coordinate across the agencies
Also, it is important that they are in the same room when key decisions are
being made.
Electricity Networks Access Code – Priority Projects – the criteria need to be
robust and transparent to support fairness and probity"*

*"Yes – state development type approach although I have doubts if we would
do that again.
Important to have all the agencies, including EPA, all in on a common plan.
Not another bureaucracy – the why is clear, the how would be important."*

*"Devil in the detail – if done well will be good.
Single point of contact from Government to help facilitate with other agencies
would be good"*

*"Yes – good idea.
Focus on key issues and going to one place rather than catch-22 with Western
Power network access application needing AEMO certification and vice
versa."*

*"Don't know – unclear at the moment as mandates are given for specific
projects or targets then it is a little hard to say at this stage"*

4.9 Question 10 State Government Support

Respondents were asked:

Does the state government do enough to encourage private capital investment and smooth the project development process?

The majority of the respondents indicated no as indicated in the figure below.

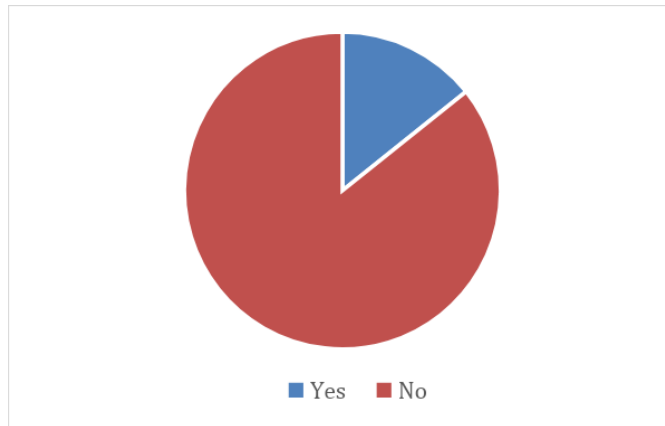


Figure 9 - Question 10 - State Government Support

The respondents took a nuanced view of state government support in the context of their experience in other jurisdictions. Provision of critical infrastructure by the Government was a recurring theme as noted in the responses below.

“We are used to much more support and in Australia Victoria is much better than WA and provided greater certainty to the market and incentivisation to investors. Network connection costs are expected, however nowhere else in the world are you expected to upgrade the network backbone to accommodate the connection of a generation asset”

“No. Seems to be very much user pays.”

“Government is trying but could improve certainty to large industry users seeking to decarbonise by making network capacity and connection available and easier to encourage full use of the network rather than considering hybrid solutions (behind the meter, embedded generation etc)”

“Slow process working through amending WEM rules (e.g. RCM which needs near constant review to ensure it remains fit for purpose).

The vision is there but the plan is missing.”

“Ministers other than energy have been supportive. Grant funding such as the Investment Attraction Fund would be significantly helpful.”

“Yes. Clearly private investors would like the government to take all the risk and they take all the profit.”

4.10 Question 11 WA Renewable Energy Hubs

Renewable energy hubs were announced in the SWIS Demand Assessment (Energy Policy WA, 2023) – the document says that “establishing renewable generation hubs in areas extending beyond the existing SWIS footprint could be a cost-effective way of maximising the amount of renewable electricity generated to meet industrial customers’ demand for a reliable, low emissions electricity supply.” Respondents were asked:

WA recently announced Renewable Energy Hubs – do they affect your proposed project(s)?

Feedback is indicated in the figure below.

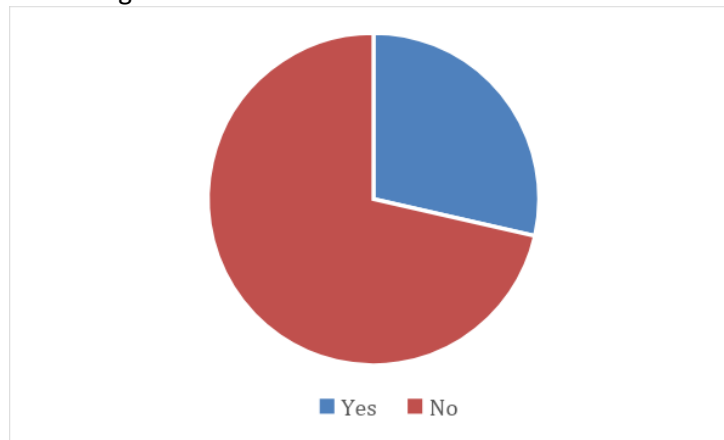


Figure 10 - Question 11 - RE Hubs Project Impact

Again, transmission infrastructure was a recurring theme and addressed more fully in Question 12. Feedback from respondents included:

“Not directly as offshore wind not addressed in the SWIS Demand Assessment.

The Energy Policy WA modelling window for OW might have been missed or not fully supported as the value proposition is not clear to all government agencies around ease of land access, reduced transmission (more direct route to load centres), complementary wind to onshore wind and solar, cost of and workload associated with the applications and approvals of multiple onshore wind farms versus one large offshore wind farm.

The proposed phasing of transmission upgrades does not align with OW projects”.

“Good idea from a policy level to allow more renewable energy into the grid. Does mean the government is picking winners – in the North that might work well but in the South West it will attract a lot of public attention. Idea of sharing firming resources and storage across the network should lead to the lowest cost solution.”

“Devil in the detail, transmission is key.”

“Government needs to recognise the value of state infrastructure and state investment in transmission specifically. The model of the past 20 years – piecemeal, user-pays investment by individual proponents for individual connections to the grid – doesn’t make sense in the context of a major transformation like we need to see. Individual project-driven investments in transmission infrastructure will likely result in inadequate or short-sighted investment tranches while a major State investment in the infrastructure to support the development of a clearly prescribed, regulated and zoned Renewable Energy Zones would be a stronger signal for generation investment”

4.11 Question 12 Renewable Energy Hubs Best Practice

Respondents were asked:

what are your expectations of a REZ / best practice?
Rank the following in relative importance

- Transmission infrastructure committed to, paid by Gov, cost recovered through fees
- Other infrastructure (ports, roads and services) provided by state / local government
- Accelerated / facilitated project approvals
- Accelerated / facilitated grid access, grid connection, technical approvals
- Participation in or access to common user social value / stakeholder / community engagement studies
- Participation in or access to common user / REZ environmental studies (e.g. flora and fauna studies)
- Participation in or access to common user / REZ technical studies (e.g. GPS/ network impact, geo-technical etc)

Note: Renewable Energy Hubs are known as Renewable Energy Zones (REZs) in other jurisdictions.

The consolidated ranking from respondents of the top features of Renewable Energy Hubs are:

1. Transmission infrastructure committed to, paid by Gov, cost recovered through fees – **jointly with** - Accelerated / facilitated grid access, grid connection, technical approvals.
2. Accelerated / facilitated project approvals.
3. Participation in or access to common user social value / stakeholder / community engagement studies.
4. Other infrastructure (ports, roads and services) provided by state / local government.

A number of respondents pointed to the European REZ model where common front-end studies, including stakeholder engagement/social value studies and wind/solar resource monitoring studies, are conducted by the Government with cost recovery via licence fees. Respondents noted the following:

“In Queensland the government conducts and shares REZ wind and solar mapping which removes uncertainty and accelerates the schedule – especially for wind projects. It takes 24-36 months of monitoring to support project approval – NETMAR is not good enough”

“The time to be planning for this transformation was probably 5-10 years ago, what the WEM needs now is strong leadership, commitment to an agreed timeframe for a low-carbon future and the certainty that comes from the government making underwriting investments in one of the most critical pieces of the state’s economic infrastructure – the one benefit of being so late to the party is there are plenty of good national and international examples of how to move forward, we don’t need to re-invent the wheel, but we do need to get rolling.”

4.12 Question 13 Investment Hurdles

Respondents were asked:

Has your cost of capital, project IRR or other financial investment criteria / hurdle or internal ranking with other projects been impacted by your WA project experience?

All respondents responded No or not applicable.

Feedback provided by respondents included:

*“No, however longer, more expensive and riskier process thus far.
Feasibility licence activities represent a sizable time and cost exposure whilst carrying
a high level of risk and uncertainty.
Much easier and faster in other jurisdictions.”*

*“Biggest influence on WACC is yield and CAPEX.
The Australian EPC environment is much less competitive than Europe – less players,
more expensive to build in Australia.”*

*“Economies across the world are clamouring to transform their energy systems to
support the switch away from carbon-intensive generation but in Western Australia
we seem to be meandering towards developing a plan to develop a plan for some
level of transformation at some point in the future – Whole-of-system-plans, SWIS-
Demand Assessments, market reviews, facilitation bodies – they’re all great but we
need to get on with it”*

4.13 Question 14 Industry Decarbonisation ROI Process

Respondents were asked:

Did you participate in the October 2023 joint Western Power / Energy Policy WA Transmission – Industry Decarbonisation ROI process?
What were your impressions?

All but one of the respondents attended the information session in October 2023 (and subsequent ROI application) during which participants were informed about the proposed policy to fund network augmentation via contributions from industry. These contributions (\$100K per MW) would be in addition to their connection costs and tariffs.

A range of views were expressed by respondents:

“Useful for the government to ask for input, get feedback and also to hear common issues and concerns from other developers.”

*“Not clear what was on offer for the price in terms of tariffs, priority access etc
Felt like they are using industry as a cash cow.*

*If generators are charged then they will seek to recover those costs hence the
electricity costs will increase.*

*Generators capital rate of return will be higher than Western Power’s whose rate of
return is regulated.”*

*“Revenue on generation is low, much higher revenues are with the large energy
consumers hence they are better placed to manage the costs. The
generators will just pass the costs on with margin which is not efficient
nor appropriate.”*

*“WP modelling as a result of the ROI will result in a 3-6 months delay to the
application process – seems to be a waste of time even if more granular
than the SWIS DA.”*

“Developers are not overly supportive”

4.14 Question 15 Western Power Critical Project Status

Western Power, as part of its process improvement process to address major customer delays, has launched an initiative titled “Facilitating timely connection of critical projects” (Western Power, 2023). This is linked to the ROI process in Question 14.

Respondents were asked:

Any comments on the Western Power recent initiative of facilitating timely connection of critical projects? Criteria, fairness, transparency, effectiveness etc

Respondent feedback included:

“Criteria need to be open and transparent and allow a level playing field for all. Western Power can have input but the selection of the best projects for consumers shouldn’t be left to WP.

Broader decision-making criteria that need to be linked to wholesale market objectives, state electricity objectives, reliability, affordability, safe and secure, lower emissions etc. Seems to be less focus on affordability which could stymie investment resulting in a greater use of gas and higher prices.

Project assessment has to be done in a very transparent manner, not government picking winners.

Needs to use the market forces to help select the best projects.”

“Western Power feedback was less than 5% of projects make it all the way from initial contact through to connection and operations, so it is important to act efficiently given the constraint on the number of highly technical people in the industry suitable for this work.

Some projects will be delayed, those delays will have wasted those resources' time. Does suit us being a large well-established company with a portfolio of operating assets. We are an attractive investor / partner.”

“Good idea to make the barrier to entry harder to screen out less worthy projects. In some jurisdictions you need to demonstrate land access arrangements are in place before making a connection application.

Current proposed criteria favour incumbents, not new and innovative market entrants. Should be based on the merits of the project:

- 1. Land access*
- 2. Ability to get a grid connection*
- 3. Probability of success of planning application”*

“Any ability to accelerate the connection / augmentation process would be useful”

“The criticism in the media of Western Power is rubbish and very time consuming and wasteful to respond to.”

4.15 Question 16 General Comments or Observations

Respondents were asked:

Any general comments or observations on the WA clean energy transition

Respondent feedback included:

“Only State with rising emissions. WA is key in Australia meeting its NDC and emissions targets.

Lack of government leadership in acknowledging the emissions problem.”

“Enormous challenge, impacting everything – roads, ports, services, skills, labour (electricians etc), volume of approvals – not BAU and will need a commensurate government response which we’re not seeing yet.

Without a price on carbon, we need to do things smarter and be clever – Government picking winners doesn’t work out well.

Hydrogen is one example (of picking winners despite repeated consultation) and is a huge distraction – good for fertilizer, explosives etc where hydrogen is a feedstock but using it as an energy vector in transport and power generation is a waste of precious time and resources. Possibly a role in decarbonising the last 1%.”

“Needs greater certainty on timelines.

Government facilitated transition by removing the roadblocks already identified. A lot of businesses don’t think they will meet their 2030 targets which creates uncertainty.

Government and business need to collaborate as there is a lot to do.

There is a lot being done and we need to remain positive, support Western Power for example.”

“Western Power has all of the risk when assessing and approving new projects, so there is a natural incentive for WP to be more conservative than is ideal (i.e. if a project is accepted and it results in network failure, WP will bear the blame). There needs to be some incentive for WP to accept this risk.”

“Delighted to see it happening and happening at pace across a lot of areas and projects (DER roadmap, battery storage etc). On track. Biggest challenge is to retain personnel who are valuable to others going through the same process.”

“Pushing the transmission onto the private sector is challenging – first mover disadvantage.

Not clear how robust the SWIS demand assessment is in predicting the energy mix in 20 years’ time.

Most of the technical issues seem to be in hand by Western Power and AEMO.

Social licence by Western Power / Synergy / others is under threat with prices going up (cost of transmission, RCM, firming etc) and reliability challenges with people not prepared to change their lifestyles. Needs to be excess capacity to compensate which comes at a price.

The Australian Energy Council is doing something similar to this survey, a worthwhile exercise."

"Synergy has a monopoly in the residential market and through its market dominance makes the market less competitive and increases the cost of electricity.

Project finance tied to PPAs (WEM Bilateral Contracts) which creates too many barriers. Other jurisdictions have decoupled PPAs thus making the process easier and less risky. Major Gentrailers signing PPAs with themselves which is not good for competition and pricing. "

"Would be useful if the State government was on the same page, in sync and sending consistent messages to the market. International players are not attracted to uncertainty.

There is no sense of urgency from AEMO and others to build 50GW of renewables by 2042 as per SWIS DA.

The Treasury could be involved to develop green bonds to finance the transmission infrastructure.

Whilst we hear the coal closure announcements, we also see the gas lobby at work with delaying tactics."

"It's time Government gave to both ends of the market – the generators and importantly, large-scale industrial consumers – certainty about hard targets and timeframes for emission reductions and the transition to a predominantly renewable energy system – the sector is crying out for certainty."

5 CONCLUSIONS

5.1 Renewable Energy Growth

Data in **Figure 2 - WA RE Capacity Growth to 2023** indicates, and feedback from respondents confirmed that, other than rooftop solar and large-scale battery storage, there is a slowing down of RE projects reaching FID and coming online in Western Australia.

This contrasts with the official position of the WA state government in recent communications (WA Government, 2023) that have set the expectation that the large number of RE projects that are in the pipeline are proceeding in a timely manner to Final Investment Decision (FID) and into operation with no significant headwinds, barriers or delays.

This lack of acknowledgement of a problem needs to be seen in context of:

- The recently ‘flat-lining’ of RE projects going into operation;
- The amount of RE installed over the last 20 years (~1.2GW of utility scale solar and wind); and
- The scale of the energy transition challenge in building 50GW of RE projects by 2042. The required utility scale solar is 63 times the currently installed base with wind 16 times the currently installed base;

The recent announcement establishing the PoweringWA entity within DMIRS is recognition that a business-as-usual approach is not adequate for the task ahead. However, noting that PoweringWA is not multi-agency and is not being set-up as a planning authority, the views of those in the sector are that it falls short of what is needed.

5.2 Critical Infrastructure Funding and Plans

Whilst there has been some additional funding announced for SWIS transmission upgrades (WA State Government, 2023) the overall approach in terms of planning and funding of critical infrastructure to support the SWIS Demand Assessment is unclear and causing uncertainty in the market and within the broader community.

The proposed ‘user pays upfront’ model for critical infrastructure (including establishing WA renewable energy hubs) outlined in the joint Energy Policy WA-Western Power industry decarbonisation Registration of Interest (ROI) process (Energy Policy WA-WP, 2023) was not supported by most industry respondents nor does it have parallels in other comparable jurisdictions.

The release of the next Whole of System Plan (WoSP) by 2025, which may contain the level of detail industry is seeking, is too far away and policy clarification on funding of critical infrastructure is urgently required. The poor quality of the WoSP has left lingering doubts with survey respondents - WoSP 2 will need to address these to help build industry confidence in government planning.

It is envisaged that the proposed Transition Authority would build on the existing energy system high level system planning documents (e.g. WoSP, SWIS Demand Assessment, WP Transmission System Plan) and generate a set of coordinated plans more consistent with a large-scale, state-wide development.

Note: The first stage of the Capacity Investment Scheme (CIS) announced by the Federal government in November 2023 was released after the survey was concluded. Whilst Stage 1 involves the NEM the scheme does apply to the WEM with subsequent CIS stages to be announced in 2024.

5.3 Renewable Energy Hubs

The WA renewable energy hubs announced in the SWIS Demand Assessment (Energy Policy WA, 2023) are insufficiently defined to develop investor confidence.

When other governments have announced REZs (renewable energy zones) they come with an implicit set of expectations around co-investment and other government support. The NSW REZs (EnergyCo NSW, 2023) provide a typical example.

Unfortunately, the messaging from the WA government and the industry decarbonisation EOI process (Energy Policy WA-WP, 2023) has undermined the REZ concept by promoting the ‘user pays upfront’ model which has had a chilling effect on investor confidence.

At the time of writing WA Offshore Wind zones, managed by the Federal government, are yet to be announced.

5.4 Offshore Wind

Offshore Wind (OW) in Western Australia is relatively new and the renewables industry as a whole have mixed views on how the technology fits into the WA energy mix. Project proponents who are onshore wind only are naturally keen to promote their technology. This analysis followed as a result of discussions with two of the survey respondents who are OW proponents.

A number of WA agencies, politicians, commentators and the wider public have been slow to recognise the value of Offshore Wind (OW) arguing that from a Lowest Levelised Cost of Energy (LCOE) perspective and availability of land for onshore wind perspective that it doesn’t ‘stack up’.

Energy modelling by both Energy Policy WA and the Australian Energy Market Operator (AEMO) use a lowest cost model to screen technologies, hence due to higher CAPEX and higher OPEX, OW gets screened out without understanding the economic and strategic value of OW.

When a broader context for OW is considered, it becomes worthy of more careful consideration in energy modelling and policy development:

1. Offshore Wind (OW) can be connected directly to load centres thus largely bypassing transmission and associated costs, reducing project timeframes and reducing the workload on Western Power and others;
2. OW can be built at scale thus reducing the number of individual onshore wind farms and related multiple land access, stakeholder engagement, consents and approvals required, and project development risk. For example, one 2GW offshore wind farm roughly corresponds to 10 typically sized onshore wind farms;
3. Approximately 80% of the energy traded on the Wholesale Electricity Markets (WEM) is under bilateral contracts (power purchase agreements) and large energy users are likely to be main buyers of offshore wind power not Synergy or other Gentailers. Hence the argument about increasing public electricity costs is less of an issue;
4. Offshore wind resources correlate well with onshore wind and solar, hence they are more valuable;
5. The State needs to have all feasible options on the table to provide for project execution flexibility to achieve the ambitious targets in the SWIS Demand Assessment.

5.5 Process Heat

Thermal storage and the subsequent provision of process heat or generation of electricity from thermal storage, either via a steam turbine cycle or via thermophotovoltaic energy conversion, is very important to the energy transition. Thermal storage technology is commercially available whilst not widely deployed nor adequately addressed in energy policy development.

Only one survey respondent was offering a thermal storage solution (Australian manufacturer MGA Thermal) as part of their overall project development. A separate survey respondent is developing options for decarbonising their process plant. The following analysis came as a result of discussions with those respondents and subsequent comments on the draft report.

Western Australian process plant operators that use large amounts of process heat (e.g., bauxite refining, cement, mineral processing) need to decarbonise their operations and are looking to a range of technologies and complete process redesign.

For those survey respondents seeking to decarbonise their operations primarily through electrification, how to generate process heat cost effectively, reliably and with low emissions is a significant challenge. Those survey respondents are evaluating large electric boilers, large heat pumps and thermal storage to replace fossil gas use in generating process heat rather than the use of green hydrogen as a fuel.

An Australian Renewable Energy Agency report (ARENA, 2019) indicated that Australian industry accounts for 44% of the nation's end use energy and 52% of that is process heat, with an indicative value of \$8 billion per year.

Thermal storage is a rapidly emerging technology that converts renewable electricity, often 'off-peak', to efficiently generate, store and return that energy as either process heat or as electricity when needed. MGA Thermal is an Australian manufacturer identified by one respondent. With the rise of renewable energy on the SWIS the amount of 'spilled energy' will increase. This spilled energy is not a waste as no fuel is used in generation. This spilled energy provides a significant commercial and technical opportunity and thermal storage is one means to realise that opportunity.

State government in its Sectoral Emissions Reduction Strategies (DWER, 2023) have taken a simplistic view that "new technologies, such as renewable hydrogen, need to be trialled and adopted at scale to ensure industry can continue to decarbonise through to 2050". Respondent feedback indicated that hydrogen is a distraction. Practical hydrogen use cases (Hydrogen Insights, 2023) are not well understood by the government. Better informed, co-ordinated and targeted support of industry decarbonising pathways is required.

Process heat and technologies such as thermal storage, and 'sector coupling' more broadly and their impact on the energy transition, are currently under-represented in WA energy planning and related policy documents.

6 RECOMMENDATIONS

Item	Recommendation	Effect
1.	<p>Establish a WA multi-agency clean energy transition authority with the necessary legislated directive powers to plan, coordinate and facilitate the energy transition at a state level. A transition authority would inject a sense of urgency and encourage appropriate levels of state investment in critical infrastructure, in renewable energy zones and grid transmission more broadly.</p> <p>State investment in infrastructure would be framed by the agency in the context of a 'whole of state development' of new industries bringing long term social value.</p> <p>Agency core functions would be additional to PoweringWA and include:</p> <ul style="list-style-type: none"> a) on-going planning role to address the scale of the change, engender urgency, ability to adapt to change, managing roadblocks and barriers; b) land access, social value, stakeholder engagement; c) consents and approvals coordination; d) support services and skills; e) public and private investment facilitation; f) manage coordination risk across the agencies; g) community education, civil society liaison and communications; h) consumer interests' representation 	High
2.	<p>Scope (and publish that scope) and fund common user critical infrastructure for the clean energy transition:</p> <ul style="list-style-type: none"> a) Green bonds or similar funding models; b) User pays over asset lifetime; c) Residential and small business customers not burdened with the costs associated with a larger regulated asset base; 	High
3.	<p>Establish WA Renewable Energy Hubs utilising best practice:</p> <ul style="list-style-type: none"> a) Provision of transmission and other critical infrastructure (roads, ports, services etc); b) Secure access rights to new transmission; c) Land-use planning and coordinated community consultation; d) Revenue certainty for private investment in new renewable energy generation, e) Renewable energy common front-end studies such as wind monitoring. 	High
4.	<p>As a means of fast-tracking network connections, Western Power accelerates its plans to enable the timely connection of critical projects.</p> <p>The state government needs to ensure that the Western Power major customer critical project status and application process is transparent and fair, reflective of best practice (e.g., land access secured before connection application submitted, bid bond or equivalent) and aligned to the wholesale market objectives, state electricity objectives, reliability, affordability, safe and secure, emissions etc</p>	High

Item	Recommendation	Effect
5.	Review and update Energy Policy WA and AEMO WA energy models to reflect the economic and technical value of a generation source (such as Offshore Wind) and not just the OPEX and CAPEX costs.	Medium
6.	Review and update Energy Policy WA and AEMO WA energy models to show the integration of process heat for existing major industries and the impact on electricity demand, renewable energy spilled energy optimisation and forecast gas use for decarbonisation via electrification.	Medium
7.	Establish a joint WA industry-government industry decarbonisation working group to look at practical application of decarbonisation pathways such as, or specifically process heat. Working group would look at what support industry needs and appropriate government involvement.	Medium

Table 1- Recommendations

7 ABBREVIATIONS AND TERMS

7.1 Abbreviations

Abbreviation	Meaning
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
ARENA	Australian Renewable Energy Agency
CIS	Capacity Investment Scheme
DWER	Department of Water and Environmental Regulation
Energy Policy WA	Energy Policy WA
ESoO	Electricity Statement of Opportunities
GSoO	Gas Statement of Opportunities
IRR	Internal Rate of Return
LCOE	Levelised Cost of Energy / Electricity
NDC	Nationally Determined Contributions
NCESS	Non-Co-optimised Essential System Services
NGO	Non-Government Organisations
REZ	Renewable Energy Zones or Hubs
ROI	Registration of Interest
SWIN	South West Interconnected Network
SWIS	South West Interconnected System
WA	Western Australia
WACC	Weight Average Cost of Capital
WEM	Wholesale Electricity Market
WP	Western Power

7.2 Terms

Term	Meaning
Critical project	WP - a customer project which meets the requirements of critical need for the State and highly probable to proceed
Delay	A period of time by which something is late or postponed beyond the original time frame agreed between the proponent and the respective agency
Gentailers	A company that is both an energy generator and an energy retailer – in the context of the survey this energy is electricity
Major customer	WP - major customer Generator projects which apply for connections in excess of 10 MVA; all transmission load connections; and any complex distribution projects with significant transmission overlap.
N-1	N-1 means that the grid shall be capable of experiencing outage of a single transmission line, cable, transformer or generator without causing losses in electricity supply.
NETMAR	The open service network for marine environmental data (NETMAR) project
Planning	<p>Planning is the process of thinking regarding the activities required to achieve a desired goal.</p> <p>Planning involves the use of logic and imagination to visualise not only a desired result, but the steps necessary to achieve that result whilst incorporating strategies and flexibility to avoid pitfalls.</p>
Sector Coupling	Connection of different industry sectors (e.g. electricity, industry, transport, water, buildings) in the context of the energy transition in order to drive decarbonisation through optimisation of the generation and use of renewable energies.
Spilled energy	Spilled energy is when excess wind and solar is simply let go by some form of curtailment: reducing output, switching circuits off, switching user
Syncons	<p>Synchronous condenser is a DC-excited synchronous motor, whose shaft is not connected to anything but spins freely.</p> <p>Installed by project proponents based on feedback from AEMO and WP on the impact to network operations from the proposed connection of new generation.</p>

Term	Meaning
	Designed to either generate or absorb reactive power as needed to adjust the grid's voltage, or to improve power factor. They also provide system inertia to help stabilise the grid.
WACC	LCOE is defined as the revenue required (from whatever source) to earn a rate of return on investment equal to the discount rate - also referred to as the weighted average cost of capital (WACC) over the life of the asset.

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9 Appendix A – Survey Questionnaire

WA Renewable Energy - Confidential Survey

Question 1 Survey ID Reference

Question 2 Is the WA energy transition plan sufficiently coherent, transparent and well communicated to industry stakeholders and the wider community?

Question 3 Type of project being developed

- Wind - Offshore
- Wind - Onshore
- Utility scale PV
- Battery Storage
- Hydrogen
- Supply / supply upgrade - existing plant decarbonisation
- Thermal storage
- Other

Question 4 How long has your project been under development

- Less than 12 months
- Between 1-3 years
- Between 3-5 years
- Between 5-10 years
- Greater than 10 years

Question 5 Has your project suffered delays due to longer than expected project development activities? Rank in importance -

"delay" means longer than the proponent was led to believe at the start

- Investor uncertainty related to level of government support
- State or Federal approval process
- Stakeholder engagement
- Western Power related
- AEMO related
- Land access
- Environmental consents and approvals
- Aboriginal, heritage or other related approvals
- Other

Question 6 Did your preferred project development have to be significantly changed to comply with a technical or regulatory requirement that seemed incompatible with the nature of the energy transition?

Question 7 Do you have operating assets in other jurisdictions / how does the WA project development /network connection process compare with those jurisdictions?

Question 8 How would you rate your WA clean energy transition experience thus far? In relation to your experience in other jurisdictions

Extremely Poor

0

1 2 3 4 5 6 7 8 9

Extremely Good

10

Question 9 What are your thoughts on a WA clean energy transition authority (Energy Policy WA's "facilitation vehicle" and now PoweringWA) to accelerate the transition? Would a multi-agency (Energy Policy WA / Western Power / AEMO / AER) authority charged with accelerating the transition be effective / useful?

Does the EPA and other agencies such as state development need to be involved given the scale of the task ahead outlined in the SWIS DA?

Question 10 Does the state government do enough to encourage private capital investment and smooth the project development process?

Question 11 WA recently announced Renewable Energy Hubs - do they affect your proposed project(s)?

Question 12 What are your expectations of a REZ (renewable energy hubs) / best practice? Rank the following in relative importance

- Transmission infrastructure committed to, paid by Gov, cost recovered through fees
- Other infrastructure (ports, roads and services) provided by state / local government
- Accelerated / facilitated project approvals
- Accelerated / facilitated grid access, grid connection, technical approvals
- Participation in or access to common user social value / stakeholder / community engagement studies
- Participation in or access to common user / REZ environmental studies (e.g. flora and fauna studies)
- Participation in or access to common user / REZ technical studies (e.g. GPS/ network impact, geo-technical etc)

Question 13 Has your cost of capital, project IRR or other financial investment criteria / hurdle or internal ranking with other projects been impacted by your WA project experience?

Question 14 Did you participate in the October 2023 joint Western Power / Energy Policy WA Transmission – Industry Decarbonisation ROI process?

What were your impressions?

Question 15 Any comments on the Western Power recent initiative of facilitating timely connection of critical projects?

Criteria, fairness, transparency, effectiveness etc

Question 16 Any general comments or observations on the WA clean energy transition.