

API SUMMER SCHOOL+ 2023

SYNDICATE PROJECT RECOMMENDATIONS





BRETT REDMAN
CEO, Transgrid

*Energy transition will
need a large skilled
workforce.*

*What do we need to do
or solve to build the
workforce?*



Group Members:

Shaya Azizi, Transmission Lines Design Team Leader – Western Power
Ryan Standing, Protection Engineer – SA Power Networks
Christina Yee, Senior Electrical Engineer – Aurecon
Genevieve Lietz, Lead Engineer – Power System Modelling, Operations, AEMO

Recommendations:

1. Smoothing of the employment profile to reduce supply-chain risks and support workforce development and local economic development. This can be achieved by integrating employment profiles into the ISP and considering sensitivities for capacity development [1].
2. Introducing the ‘supply-chain adjusted’ development pathway that includes a maximum and minimum annual build in each industry to reduce volatility as the least-risk model, as defined in [1].
3. Devising effective sharing (of design, maintenance, and testing) strategies between utilities.
4. The use of comprehensive standard design packages for asset design.
5. Implementing strategies for designing efficient and low-workforce construction processes.
6. Efficient work process for Design and Construct (D&C) contracts, partnerships and onboarding more D&C Accredited Service providers (even overseas) for customers to connect independently.
7. Centralising data storage and model management on a company-wide basis to improve efficiency and eliminate duplicate work.
8. Developing and harnessing highly efficient workflows for repetitive and time-consuming tasks via the use of artificial intelligence (AI) and machine learning (ML) technology.
9. Automation in design, construction, and maintenance.
10. Reskilling and upskilling workers to transition from old technologies to new and emerging systems.
11. Fast-tracking in-job training and upskilling.
12. Improving recruitment both onshore and offshore, and retention onshore. To successfully resource workers from other countries, sufficient processes must be in place to make migration both possible and appealing (i.e., expedited visa approval process, entire family migration, affordable housing, and attractive remuneration packages).
13. Expanding the workforce of the future through education and marketing at all levels of education: primary, secondary and tertiary, including industry-sponsored bachelor’s degrees.



KELLY WOOD

EGM Network Delivery &
Services, Ausgrid



What more can we do as an industry to meet customer's expectations around decarbonization, distributed energy resource (DER) connectivity, and resilience, while still balancing the need for affordability and cost of living in our supply of electricity.

Group Members:

Simon Willis, Principal Electronics Engineer - Redback Technologies

Robert Chang, Senior Engineer Telecommunications Design - Powerlink Queensland

Ponny Thomas, Senior Power Systems Engineer - AEMO

Alex McKay, Substation Engineer – TasNetworks

To address this challenge as a DNSP, the syndicate group makes recommendations in two main areas:

Recommendations:

1. Managing network demand, through:
 - A variety of direct demand control methods, including flexible export control of PV, encouraging consumer participation in VPP schemes, incentivising dynamic load control, and increasing controls around new EV loads.
 - Additional indirect demand control methods, such as encouraging uptake of time of use tariffs to cater for expected growth in EV load demands, and demand tariffs, which will require more dialogue with customers to allow them to identify which loads are contributing to their peak power usage.
2. Collaborate more closely with key external stakeholders such as:
 - Consumer organisations, to better understand and educate consumers and their role in the energy transformation.
 - Network aggregators and regulators, to remove barriers and accelerate the development of this important emerging market role.
 - Research organisations such as "RACE for 2030" which offer technological advancements to meet the decarbonisation targets.

Executive Summary:



EXECUTIVE INSIGHTS

2023 SERIES

Challenge
Question #3



PETER PRICE

EGM Engineering
Energy Queensland



Part of Energy Queensland



How do we lead delivery of the transition and ensure we don't lose our social license?

Aka, our customers in our communities lose faith in the energy sector (because of blackouts, or because we leave people behind).

There is a widening gap between the haves and the have nots in electricity pricing and the energy transition.

How do we support all customer groups, particularly the disadvantaged, so that we all benefit from the transition?

Group Members:

Shahpar Ahmed, Senior Project Manager - Transgrid
Sanah Al Safadi Chaar, Senior Electrical Engineer - Aurecon
Fraser Hampton, Substation & Planning Engineer - SA Power Networks
Jane Yu, Senior Analyst - AEMO

Recommendations:

1. Ensure targeted engagement with stakeholders of large infrastructure projects.
2. Reframe the value proposition of the electricity industry to consumers through retail market design.
3. Legislate retailers to provide new customers with a standardised factsheet produced by government.
4. Establish a common understanding of the target end outcome of the energy transition and common agreement on the pathway to meeting this end outcome.
5. Upskill the workforce to tackle new and emerging challenges, focussing on:
 - Stakeholder communication and consultation
 - Change management
 - Emerging technologies and industry trends
6. Provide opportunities for networking and collaboration for individuals.



RENEE ANDERSON

Executive – People
TasNetworks



“The energy transition is going to require significant new investment and infrastructure, in both generation and transmission. The energy ‘Trilemma’ points to the balance between security, affordability and environmental sustainability. In some instances, the new infrastructure may need to be built in high-value environmental areas, and across private land to be the most reliable and affordable for customers.

How do we approach this challenge of balancing the ‘trilemma’ – what trade-offs might need to be made between the three arms of the trilemma?’”

Group Members:

Jieh Loong, Planning Engineer- Western Power
Maryam Hasheminamin, Renewable Design Lead Engineer- Endeavour Energy
Nina Modseni,- Senior Engineer – AEMO
Paul Cullen, Team Leader Lines Strategies- Powerlink
Taru Veijalainen, Senior Analyst- AEMO

Recommendations:

1. Re-evaluate the value of customer reliability to determine whether elements of system security may be compromised for affordability.
2. Consider energy efficiency measures that will help to balance affordability and environmental concerns.
3. Seek opportunities to create new value streams for consumers that balance security and affordability.
4. Work with local communities to determine whether compensation can be provided to landowners annually, to balance affordability and social concerns.
5. Evaluate whether there are opportunities to create new jobs for local communities and First Nations’ representatives that can provide a sustainable long-term stimulation to the local community’s economy.
6. NSPs to continue to drive innovation in the adoption of disruptive technologies in the planning, design, operation, and maintenance of the network to drive down long-term costs.



SCOTT RYAN

Chief Asset and Operating Officer,
Endeavour Energy



“Climate change is resulting in more frequent and more severe major events. Our customers endure outages at the time they need power the most. What should we do differently to support our customers? What can we do through elimination, prevention, or response to climate change? And how do we better empower our customers for these events?”

Group Members:

Matthew Crutchfield, Electrical Engineer – Wilson Transformer Company

Jessica Jones, Senior Network Integration Officer – Energy Queensland

Dulani Nanayakkara, Electrical Systems Lead, Energy- WSP

Justin Pickering, Senior HV Designer- Yurika

Lauren Tan, Senior Transmission Planner- Ausgrid

Recommendations:

1. Empower customers to better prepare themselves against major events.
2. Improve business planning preparedness & response to events to build network and business resilience.
3. Investigate and implement alternate supply options and innovative solutions for customers such as: stand-alone power systems (SAPS), solar pumps, mobile community batteries, high voltage injection units, drones, delivery of emergency power packs and phone charging stations.



DR BILL LILLEY

Chief Research Officer,
RACE for 2030 CRC



“As a case study for how organisations better work together to develop and implement the innovations needed to support the energy system transformation in Australia:

How do we (the RACE for 2030 CRC) work with industry and university stakeholders to develop a research plan that best satisfies our wide range of stakeholders? Our industrial partners often have short-term pressing issues, and our research partners are often focused on long-term transformative change. What is the best way to balance this tension of immediate vs long-term research needs? Given how extensive and fast change is and will be happening within all our organisations, what do we need to be doing differently to engage with and support the breadth of the power sector workforce? How would you approach this situation and how do we effectively engage with people in roles that don't traditionally connect with research and innovation?”

Group Members:

Bianca Christison, Manager Network Development - AEMO
Barton Hellyer, Senior Engineer Future Grid - Endeavour Energy
Daena Ho, Senior Engineer - AEMO
Andrew Wheatland, Secondary Systems Engineer - SA Power Networks

Recommendations:

There is often a mismatch between the skills and knowledge that graduates, students, and PhDs acquire in academia and the skills that are in demand in industry. This creates a workforce skill gap that needs to be addressed. It is recommended that a focus is placed on:

1. Interdisciplinary skills such as communication, negotiation, and commercial mindsets.
2. Technical writing training relevant for both academia and industry
3. Greater collaboration opportunities such as co-supervision of PhD projects



MARGARET PYRCHLA

Executive Manager Energy
Transition & Sustainability,
Western Power



“
Aside from setting climate
change targets, what role
should the federal/state
governments and policy
makers play to ensure these
targets are met?”

What actions can technical
professionals in the power
sector workforce take to
support these roles?”

Group Members:

Blake Ashton, Network Systems & Data Analyst- SA Power Networks
Ben Dufty, Delivery & Performance Optimisation Manager- Endeavour Energy
Marcus Excell, Asset Performance Team Leader- TasNetworks
Inez Zheng, Grid Connections Manager- Akaysha Energy

Recommendations:

- Empowering the customer** Provide our customers with information to upskill and inform them on the energy transition. As such a key component of our climate change objectives, customers need to be taken on the journey to understand what, why and how of our transition plans, and the key roles they play within this transition. This includes providing the ability to understand complex technologies and enable ease of market participation to reduce barriers to entry and decrease payback time of investment.
- Facilitating early transition of generation sources** the government should fund, provide frameworks and incentives to promote installation of new technologies, such as storage, to facilitate a better market outcome for renewable projects in the midst of transmission build. Training the workforce to support the skill gap in the construction, operations and maintenance of new technologies is necessary to empower a sustainable transition.
- Increasing demand side investments and incentives** Electric Vehicles (EVs) will play a significant role in demand side response and initial government investment and incentives will need to focus on the rollout of a versatile charging network allowing consumers to “fuel” their vehicles in the locations where they park. With the further electrification of the network and the higher uptake of electric vehicles, the expectation is that more options for electric vehicles will result in a lower overall cost of ownership helping consumers to transition. The need to control consumer demand with energy efficiency measures (home insulation and efficient appliances) are crucial in enabling consumers to control the affordability of household electricity as well as the demand on the grid.
- Boosting innovation through a strong entrepreneurial ecosystem** to ensure sustainable innovation of new green technologies to support renewables, Australia needs to have a strong entrepreneurial ecosystem. The current gaps lie in improving 1. a technology agnostic but clear and simple regulatory framework and infrastructure, 2. venture capital funding and finance opportunities and 3. an innovation culture from both the investors, technology adopters and inventors.



STEWART BELL

Executive General Manager Network
and Business Development,
Powerlink Queensland



Group Members:

Melissa Taylor, Senior asset strategy engineer - Transmission Substations - TasNetworks
Glen Adcock, Senior Technology Innovation Engineer – Energy Queensland
Katrina Thomlinson, Reliability, Supply Quality & Ratings Engineer - Ausgrid

Recommendations:

The Recommendations in this report have come from five action areas.

1. Know your community
2. Community knowledge share
3. Involve the community in the decision-making process
4. Provide appropriate compensation
5. Get the community to play their part



As an industry we are often saying how we need to do earlier community engagement.

So how can we meaningfully involve the community in the planning of energy infrastructure to lead to better siting with regards to social and environmental impacts?





HEIDI SICK

Industry Director, Energy
Australia & New Zealand



“Transmission networks are the key enabler for unlocking the next wave of renewable energy generation to decarbonise our energy system, and our economy to avoid catastrophic climate change and price instability. The scale and speed of transformation required is unprecedented.

How can we fast-track the build-out of tens of thousands of kilometres of transmission network across the NEM?

Group Members:

Deepthi Yogiswara, Intelligent Grid Engineer – Energy Queensland
Dilini Darmawardana, Network Engineer - TransGrid
Meagan Evans, Principal Project Manager - AEMO
Mohammad Jafari, Senior Asset Performance & Risk Engineer - TasNetworks
Myra Nolan, Estimation Manager - TransGrid

Recommendations:

To fast-track transmission infrastructure at the planning level, it is recommended that:

1. A National Transmission Delivery Agency be formed to provide direction, coordination, and support to all stakeholders, such as local governments, transmission and distribution network service providers. Such an agency can promote coordination and coherence in the application of standards and guidelines across different jurisdictions.
2. A priority agenda for the National Transmission Delivery Agency is to develop common Recommended Practices (RPs) and procedures in collaboration with its stakeholders. These would target, as a priority, the areas of transmission network build that can benefit from standardisation. Significant benefits of design standardisation include economies of scale, reduced lead times in equipment purchasing, improved efficiency and better utilisation of the skilled workforce on a diverse range of transmission line infrastructure.

Overall, as Australia aims to meet its renewable and decarbonisation targets, the fast build-out of transmission infrastructure is crucial. By advancing these recommendations, we can ensure that the necessary infrastructure is put in place to meet the country's goals in a timely and efficient manner.



MERRYN YORK

Executive General Manager,
System Design, AEMO



Most of the Executive Insights speakers have discussed the transition and its challenges – workforce, environment impacts, price outcomes and supporting different customer groups. There are many many aspects that need to come together for the transition to be successful.

How do we bring people (communities, landholders and industry) into the challenges of the energy transition in an uncertain environment while recognising decisions need to be made and we need social licence to implement them?

Group Members:

Fiona Isaacson, Job Scheduler - TransGrid

Samuel Mayberry, Senior Project Engineer Batteries – Energy Queensland

Randy Supangat, Principal Engineer - Network Operations – Western Power

Kim Whattler, Network Project Delivery Manager – Western Power

Recommendations:

1. **Technical:** The locations of major load zones need to be selected by balancing several factors including the proximity to renewable energy zones, proximity to resources, proximity to transport, land availability and connection cost with the aim to minimise the land requirements. The strategic network development plan needs to explore the supported capacities in renewable energy zones and major load zones as well as develop the staging plans.
2. **Policy:** Implementation of strategic network development policies to factor in economic, social and engineering aspects. These policies drive innovation for future renewable generation connection to the network including staging and how much renewable generation can be connected as we transition to reach the net-zero targets by 2050.
3. **Workforce:** Building a workforce that can not only translate highly technical information about the transition steps into concise messages which all stakeholders can understand, but a workforce who understands both the local impacted townships and indigenous communities and knows how best to engage with them is going to be vital to getting these key stakeholders on board and building social license to operate.
4. **People:** Whilst most people are supportive of moving towards a greener energy future and are familiar with the term 'net zero', few people really understand what that energy transition means or entails. Involving stakeholders in the energy transition will help to facilitate the rapid shift to renewables and avoid costly delays to achieving government targets.