POLICY WEBINAR

Convergence in Transport - Energy

Tuesday 29 March 2022

Aneetha de Silva
RA Vice President

Mandi Mees
RA Policy Committee

Jonothan Clarke
Ausgrid

Carola Jonas
Everty

Sandra Lau
Viva Energy

Cameron O'Reilly
Marsden Jacobs Associates

About Roads Australia

Roads Australia (RA) is the peak body for roads within an integrated transport system, representing an industry that contributes $236 billion annually to the economy and supports 1.4 million jobs.

RA brings industry, government, and communities together to lead the evolution of Australia's roads, integrated transport and mobility.

Roads Australia's members include all of Australia's transport agencies, road owners, major contractors and consultants, material suppliers, service and technology providers, and other relevant industry groups.

RA's policy focus extends across five activity streams: Safety; Capacity; Transport Reform; Customer Experience; and Sustainability. Diversity and Inclusion is a commitment across each stream.

Background

This RA Policy Insights is the second in a series of webinars on the convergence of transport, energy and technology supporting the transition to Zero Emission Vehicles (ZEVs).

Following our first webinar on the topic, this webinar has focussed on the energy sector.

In this webinar, panellists looked at what the transport and energy sectors need to do to successfully achieve transport's decarbonisation and meet Australia's net-zero goals?

Event summary

The speakers for this webinar included:

Jonothan Clarke, Customer Manager, Ausgrid

Carola Jonas, Chief Executive Officer, Everty

Sandra Lau, Alternative Fuels Manager, Viva Energy and Director, Australian Hydrogen Council

Cameron O'Reilly, Associate Director, Marsden Jacob Associates

The webinar was hosted by Aneetha de Silva, RA's Vice President, Chair of the Transport Reform Policy Stream and Managing Director, Government Australia & New Zealand at Aurecon.

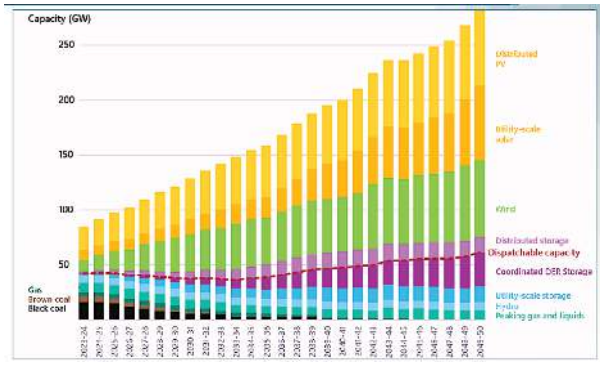
RA's Deputy Chair of the Transport Reform Policy Stream and Head of Program and Partnerships at the National Transport Commission, Mandi Mees, facilitated the event.

Future energy supply and demand

Jonothan Clarke commenced the discussion by detailing the deep change the energy industry is undergoing. There are shifts happening in how Australia's energy is sourced and supplies customer demands. Historically, energy has been provided through centralised power stations operating with relatively static and predictable supply demands. With the development and implementation of new technology and renewable energy, the generation mix is shifting towards intermittent and distributed energy sources with flexible supply demands.

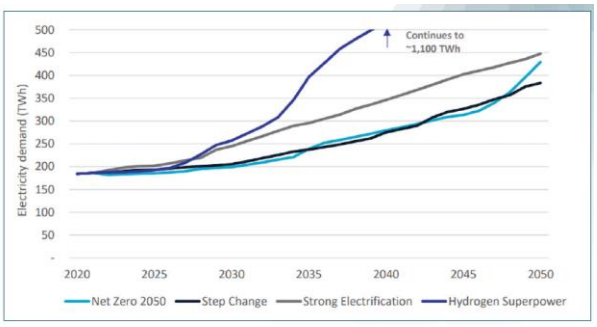
This is accompanied by increasing network demand, as more appliances are being electrified on the pathway to decarbonisation.

Cameron O'Reilly suggested that balancing the system will be far more challenging for market operators in future. Cameron referred to the supply side challenge for Australian electricity as being "unprecedented."



National Electricity Market Supply changes to 2050 – *Source: ISP Draft 2022*

Using information generated by the Australian Energy Market Operator for the 2022 Integrated System Plan Cameron discussed concerns including the reliability of generation and the dispatchable capacity as well as the increasing demand requirements, including the impact from transport electrification.



National Electricity Market demand changes to 2050 – *Source: CSIRO Multi Sector Modelling for AMEO 2021*

Carola Jonas reminded the audience that new technology needs infrastructure upgrades. Carola used a fitting example of the evolution of the internet. It was as recently as the 1990s that dial up internet was widespread and couldn't function at the same time as a landline. That was only 30 years ago and now we have the NBN and satellites for highspeed internet connections.

The transition we saw in internet could not have happened without effective infrastructure planning. Infrastructure plays a large part in people's everyday lives and the transition to EVs will not change that, so we need to plan accordingly.

Electricity from renewable sources will be a large portion of a decarbonised energy grid, but it is not the sole energy source in the grid of the future to expedite decarbonisation in the transport sector.

Sandra Lau talked through the benefits of hydrogen as a fuel in transport. Hydrogen as a more energy dense fuel results in freight vehicles being able to transport bigger payloads as compared to battery electric.

The business model for the use of many large trucks and other freight vehicles requires them to be on the road for many hours per day, necessitating short refuelling times to reduce downtime.

Hydrogen powered vehicles allow for similar refuelling patterns, still taking only 15-20 minutes to refuel.

Cameron agreed with the opportunities Australia has in the hydrogen economy. There is significant global investment in hydrogen and Australia is rich with resources for its production. Australia has the potential to become a large supplier.

Viva's recent announcement of undertaking Australia's most ambitious hydrogen project to date was highlighted by Sandra. This project aims to refuel commercial vehicles back to base with green hydrogen generated on site in a project in Geelong. This will also allow Viva to work with its partners to improve their understanding of how best to transition vehicle fleets.

A totally renewable energy system along with a strong hydrogen industry brings our transport and other fuel reliance completely onshore, reducing our vulnerability to movements in overseas markets and could create a significant new energy export market.

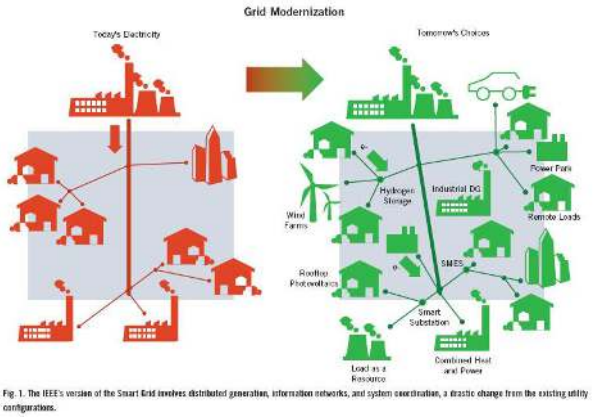


Fig. 1. The IEEE's version of the Smart Grid involves distributed generation, information networks, and system coordination, a drastic change from the existing utility configurations.

"There's been a lot of discussion over the years about a smart grid. But if ever, we needed a smart grid, it's now."

- **Cameron O'Reilly, Marsden Jacob**

Customer behaviour

Customers and their behaviour around charging will ultimately determine the transition of the energy grid to support EVs.

Jonothan gave an insightful overview of how much transport and energy affect average Australian household costs. Based on external research into households in NSW, Ausgrid stated that a typical household will spend $4,922 per year on their energy demands. That cost is 33% on electricity - while 60% of household energy spend is on petrol and diesel.

"So, when we look at it in terms of the total lifecycle cost of electric vehicles, they look quite promising now ".

- **Jonothan Clarke, Ausgrid**

Charging behaviour can have a large impact on the ultimate design of the energy grid. Private vehicles are on average stationary for 95% of the day giving ample opportunities for EV owners to make the most out of slow charging at home or work.

Research from the Boston Consulting Group outlined by Carola forecasts that of the public charging infrastructure expected in Europe, 90% will be at homes and businesses and more than 70% of public chargers will be slow charge at destinations where cars are parked for multiple hours.

Influencing and aiding customers to make choices that benefit themselves and the grid could help reduce the infrastructure investments required to the energy grid. Emerging technology is already investigating this through an increased use of smart charging.

Internationally the Netherlands is targeting 70% smart chargers and the UK has mandated that new building chargers must be capable of enabling new kinds of smart charging models.

Bi-directional charging using smart chargers would allow the energy stored in a vehicle (bought by EV owners at times of low cost) to support the grid (or their homes) at peak periods when energy costs are higher.

Carola also supplied a thought experiment using the energy demands of the Sydney Opera House as how this could also work away from the home.

Of the 1200 parking spots under the Opera House, the energy demands for a performance can be met using energy supplied by just one quarter of these vehicles using bi-directional charging. Those who are part of a smart charging scheme could potentially charge their battery during the day when energy prices were at their lowest and be paid to supply a portion of that charge to allow them to attend an event at the Opera House.

Trialling different customer behaviour incentives is already underway in Australia.

Jonothan discussed Ausgrid's *"Dynamic Connections and Pricing Innovation"* that will allow new capabilities to help manage increasingly two-way energy flows. An example is sending signals to shape EV charging, dialling up or down usage where there is network capacity available or capacity shortfall. An indirect benefit from this is that it does not necessarily require expansion of the amount of network infrastructure.

Ausgrid is also conducting community battery trials. These place an energy storage facility on the network close to customers so they can deposit and withdraw energy from this shared battery solution. Ausgrid also partners with Jolt to offer electric vehicle recharging facilities. The first seven kilowatt hours - about 45 kilometres of range - are free and sourced from green energy.

"A key change in Ausgrid's new approach is to be more customer focused, working more in collaboration with customers and partners."

- **Jonothan Clarke, Ausgrid**

Collaboration and partnership, with private and corporate customers and across sectors, is essential to the transition. Sandra explained that successful energy partnering requires a different approach with more transparency, equal risk appetite and acknowledgement of what everyone is trying to achieve to ensure aligned goals.

Such principles enable the required new partnerships and experimentations that can accelerate Australia's target electrification, using viable underlying models that are sufficiently sensitive to marketplace pricing signals.

This transparent approach is also required as there is an upfront cost of shifting away from mature industries with markets that have evolved over decades. Being aware of this and understanding the goal is important from the start.

"On a commercial basis, I think the transport sector has to recognise that new technologies do cost a bit more...and that there could also be an operational risk element there as well."

- **Sandra Lau, Viva Energy**

Harmonisation

The decarbonisation of energy and transport sectors is a complex challenge and needs to occur simultaneously in order to gain the best outcomes.

A harmonised, national approach will allow for the creation of overarching regulations and will ease the challenges caused by the transition.

Carola pointed out the fuel excise, and the way that states are considering the implementation of electric vehicle road user charging, as an example of an inefficient policy which should be transformed to a broad, nationally harmonised road user charging system.

"Fuel excise is a federal tax and now individual states (VIC) introduce state-based road user charges where you pay tax to a state regardless of where in the country you drive your car: that approach makes no sense to me."

- Carola Jonas, Everty

A further consideration for the transition is ensuring no one is left behind. There is a role for government to make sure it is an equitable transition. If left solely to the private market, the more heavily trafficked metropolitan areas will be prioritised for new infrastructure, neglecting regional and rural Australians and strongly demonstrating that decarbonisation is also a matter of equity.

The panel agreed governments need to recognise that the EV charging infrastructure and bringing EVs into that charging system should really be their priority, but that more work could be undertaken to incentivise the supply of cleaner cars, such as emission standards.

Parting Thoughts

Moving away from the mature and complex energy system currently in place will require collaboration of effort to reduce the costs and the risks of unexpected negative outcomes.

The decarbonisation of the transport industry is an unprecedented challenge that interconnects with the energy sector – with the challenge being how to achieve both simultaneously.

This challenge also comes with enormous opportunity. The creation and maintenance of partnerships between industries will allow these opportunities to be taken advantage of so we can all continue the journey towards net-zero together.

"I loved how there was a lot of discussion around those opportunities, with both reflection on the need for different business models, as well as new approaches that are national, transparent and collaborative.

"These are words that we at Roads Australia use a lot in our own world. It's heartening to see that when you bring energy and transport together, the same principles and behaviours are what is going to lead us to success, or something less than that."

Aneetha de Silva, Vice President, RA

Event outputs & next steps

An overview of the Convergence in Transport event and the broad themes addressed by each speaker was circulated via RA's LinkedIn feed.

This was the second in a series of four webinars on the transition to Zero Emission Vehicles held by RA in the lead up to the 2022 Transport Summit in Melbourne on 19-20 May.