

19 June 2020

The Hon. Angus Taylor MP  
Minister for Energy and Emissions Reduction  
PO Box 6022  
House of Representatives  
Parliament House  
Canberra ACT 2600

Submitted via online consultation hub: <https://consult.industry.gov.au/>

Dear Minister

## **Re: Technology Investment Roadmap Discussion Paper**

On behalf of Victorian electricity distribution networks, CitiPower, Powercor and United Energy, I am pleased to submit this response to the Technology Investment Roadmap Discussion Paper (the Roadmap) released by the Department of Industry, Science, Energy and Resources.

Our networks deliver safe, affordable and reliable power to more than 1.7 million homes and businesses and are among the most efficient and lowest cost to customers in the National Electricity Market (NEM).

CitiPower is the most cost efficient network in the National Electricity Market providing electricity to Melbourne's Central Business District and surrounding suburbs. Powercor is Australia's leading rural electricity distribution network supplying the western suburbs of Melbourne and western Victorian regions with 99.97% reliability. United Energy supplies the east and south-eastern suburbs of Melbourne and the Mornington Peninsula and is recognised as a leading innovator of solutions for electricity supply challenges.

We acknowledge our role in facilitating new energy technology benefitting the environment and the communities we serve. Through our networks, we are supporting the emerging products and technology offering new choices for customers and integrating power generated from a variety of renewable energy generation sources.

Our role in the electricity supply chain also enables us to contribute to low emissions objectives by:

- facilitating the uptake of large-scale and private renewable energy generation to support homes and communities while sustaining distribution system security
- reducing the impact of our operations through improved network efficiency, reduced distribution losses and environmental protection initiatives
- building network resilience to ensure we can sustain high levels of reliability of electricity supply while environmental conditions become increasingly challenging.

In addition to responding to specific questions raised for stakeholder input on the Roadmap, we also offer observations and insights into current technology initiatives proposed.

## Stakeholder input sought

The discussion paper sets out five questions for stakeholder input. We have chosen to respond to three specific areas.

### ***Item (a) The challenges, global trends and competitive advantages that should be considered in setting Australia's technology priorities.***

The key challenge networks are observing as Australia transitions to a cleaner energy future is the uncertainty of consumer demand.

Changes in our operating environment are being driven by the speed of technology development and growing affordability of consumer choices. Often these choices are encouraged through government policy and regulations as well as economic conditions.

Through consultation to support our Regulatory Reset Proposals for 2021-2026 submitted to the Australian Energy Regulator (AER) in January 2020, customers said they are looking to us to provide options that will enable them to explore emerging technologies. Customers are changing the way they use, store and sell electricity. They are also seeking information in a way that is easy, seamless and makes them feel in control of consumption and energy decisions.

As an example, the capacity of installed solar on our networks is forecast to increase in the next five years as the proportion of customers with solar grows. We recognise customers are seeking to lower electricity bills, have greater energy independence and help the environment.

Network	Current (30 April 2020)		Forecast by 2026			
	Residential customers with solar PV	Proportion of total customers	Forecast numbers 2026	Forecast proportion of total customers	Solar capacity increase (MW)	Solar capacity increase (%)
<b>CitiPower</b>	13,084	5%	73,845	24%	234MW	202%
<b>Powercor</b>	134,000	19%	288,928	34%	750MW	120%
<b>United Energy</b>	80,130	11%	163,766	23%	380MW	140%

Higher network voltages caused by solar mean that if we do nothing, customers' solar will be automatically constrained by their inverters.

It is for this reason that our Solar Enablement program proposed as part of the Regulatory Reset is intended to allow approximately 95% of customers to connect a 5kVa solar PV system with export capacity.

This involves significant network capital expenditure but is estimated to generate a greater value in net benefits to all customers by replacing higher cost generation and reducing carbon emissions.

At the same time, the take-up of residential batteries, electric vehicles, load control and home automation systems is expected to rise as the price of new products falls. These technologies

have the potential to change the daily demand profile for electricity by influencing the flow of power both to and from a customer connection.

These new technologies also open opportunities for new trading markets for distributed energy such as aggregation or peer-to-peer trading. These are increasingly forming part of the value proposition for private investment. Without the capacity to export electricity to efficient and resilient networks, these new markets may not develop efficiently.

Conversely, customer attitudes to changing climate patterns and the liveability of temperatures inside their homes is placing greater reliance on air conditioning and heating. How we manage demand during peak periods in summer and winter is more often relying on both network planning and direct collaboration with customers for demand control. Two-thirds of household customers consulted said they would use real-time data to help reduce energy costs.

This more dynamic market is necessitating upgrades to our networks, an improvement in network visibility, the provision of more data to market operators and our customers.

**Item (b) *The shortlist of technologies that Australia could prioritise for achieving scale in deployment through its technology investments (see Figure 7 of the Roadmap).***

Large-scale batteries

While there has been significant focus on batteries with greater than 100MW capacity installed within communities, we are exploring the feasibility for smaller batteries to target network constrained areas or customer opportunities.

United Energy has installed two 75kWh pole-mounted batteries supporting between 50 and 75 homes each to trial how this technology can manage peak demand on the low-voltage network. This \$500,000 trial is funded by the AER's Demand Management Innovation Allowance and United Energy.

The cost of batteries is still out of reach for many households but the benefits of stored energy, particularly in conjunction with rooftop solar photovoltaic systems, is well recognised by networks and customers. We'd encourage the government to consider technology to support smaller-scale shared infrastructure at a community level as well as large-scale batteries.

Distributed Energy Resources integration (DER)

To ensure DER integration is managed effectively and for the full benefit of customers, broad changes to the way the NEM operates may need to be considered. We are monitoring and contributing to a range of consultations in this space with various government bodies. This includes discussion of the defined role and function of Distribution System Operator, necessary to sustain the reliability of electricity supplied to customers while managing and monitoring local power flows in real time.

Large-scale solar and wind

Some of Victoria's best resource areas for wind and solar generation are within the Powercor region. Since 2000, we have connected a total of 1,196MW of renewable energy generation to our network.



In 2019, four of the solar farms within our network were required by AEMO to constrain generation due to system stability issues. These constraints have now been provisionally lifted due to successful testing of new tuned inverter settings. However, work is continuing to develop a sustainable long-term solution to maximize the potential of future generation capacity and investment. This requires further development of AEMO's approach to system strength services and issues, supporting transmission infrastructure development, technology innovation through equipment manufacturers and potentially changes to how the National Electricity Market and industry operates.

#### Remote area power systems/micro-grids

Powercor is one of five partners in the Donald and Tarnagulla Microgrid Feasibility and Demonstration Project led by C4Net and which was recently successful in receiving funding through the Regional and Remote Communities Reliability Fund Microgrids 2019-2020 Program. We are committed to supporting this project and we are in discussions for similar initiatives being considered by remote communities.

However, the relative priority of this technology needs to consider the potential scale of deployment. Preliminary analysis of our Victorian networks indicates there are potentially limited opportunities for microgrid developments and challenges in relation to cost and reliability that will benefit from current feasibility studies.

#### Grid simulation technology

CitiPower, Powercor and United Energy have already modelled their distribution networks and can transition to real-time simulations with a small amount of funding. A proposal for the development of our digital network capability has been outlined in our Regulatory Reset Proposals for 2021-2026.

A key enabler of this simulation technology has been the advantage of the roll out of advanced metering infrastructure (or smart meters) in Victoria. This has resulted in improved network reliability and safety, reduced network operating costs delivering benefits for customers, and supported planning for solar export enablement.

Data available from smart meters servicing more than 97% of our residential customers also provides a critical input to network technology to enable close monitoring of power usage and flows in near real-time.

The proposed Digital Network program will build on this capability to enhance our network efficiency and safety while also providing customers with greater flexibility by:

- promoting electric vehicle uptake
- optimising load control of customer appliances such as air conditioners and pool pumps
- enhancing cost-reflective pricing tariffs
- detecting electricity theft.

Significantly, our investment in the digital network is forecast to have a significant multiplier effect in terms of benefits for all customers estimated to be valued at approximately 7 times the investment cost.

As a result, we would encourage the government to consider AMI or smart meter technology as a priority under the Roadmap.

**Item (d) *What broader issues, including infrastructure, skills, regulation or, planning, need to be worked through to enable priority technologies to be adopted at scale in Australia.***

As regulated businesses, distribution networks' proposed investments, pricing plans and rate of return are approved by the AER every five years and this determines the revenue we are able to recover from our customers.

Under this framework, our ability to be proactive in developing technologies in advance of customer demand is constrained by economic analysis which does not currently take into consideration broader customer, environmental and social benefits.

There is a need for regulatory regimes to support network investment to ensure infrastructure can support the growing demand for these technologies by consumers which can be difficult to predict. For example, this is essential in order to support the level of network augmentation that will be required to optimise the developing DER systems.

Similarly, we note the importance of proactively developing smart inverter settings and regulation to ensure new technologies are supported. For example, the rapid uptake of residential solar PV systems in the past two years supported by Victorian Government policy and programs preceded the development of standardised settings necessary to enable exports while sustaining network stability and reliability.

Ultimately, having regulatory frameworks which enable better planning and preparation for new technologies will result in better outcomes for our customers, communities and the environment.

## **Conclusion**


Reviewing the key technology challenges and opportunities contained in the Roadmap, our response has focused on real, costed and achievable technology solutions that can be delivered within the short to medium term.

These solutions have been included in the 2021-2026 Regulatory Proposals for CitiPower, Powercor and United Energy. Under these plans, we are proposing a comprehensive set of initiatives, including our solar enablement and digital network programs, to facilitate the uptake of renewable generation. Each of these supports the uptake of low emissions technologies and delivers quantifiable and unquantifiable benefits to customers. These programs are proposed to be delivered while we continue improve operational efficiency and lower costs for customers.

We thank the Federal Government for the opportunity to respond to the discussion paper.

Should you have any queries, I can be contacted by email at [jpafumi@powercor.com.au](mailto:jpafumi@powercor.com.au)

Yours sincerely



Joanne Pafumi  
General Manager Corporate Affairs  
CitiPower, Powercor and United Energy

