Future-proofing Energy for Regional NSW: Unlocking Essential Energy's Sub-Transmission Thermal Capacity

John Cleland keynote speech at Regional Australia Institute National Summit 2024 held in Canberra on 14 August

Essential Energy is a distribution business. We build and maintain the network of poles and wires that deliver electricity into the homes and businesses of 890,000 customers (representing approximately 2.4m people) across the length and breadth of regional and remote NSW. We live in, work in, and ensure the communities of regional NSW are connected to a reliable electricity supply. Furthermore, our substantial sub-transmission network means that we also host utility scale generation and storage, and this puts us in a unique position to leverage our network to help deliver the clean energy transition for the benefit of our customers and communities.

Climate change is impacting the way the world moves and manufactures. The challenge is immense: our modern world is built on abundant and cheap energy. Replacing this energy, still mostly supplied by fossil fuels, will take billions of dollars of investment, invention and innovation and will take decades to execute. These changes will impact everyone, and every part of the economy.

In response to this, Australia has embarked on a clean energy revolution. As a developed nation with abundant space, wind and sunshine, we are ideally placed to pioneer large scale renewable energy as the predominant source of generation.

Regional Australia is hosting much of this revolution. The wind farms, solar farms and transmission lines that will be the backbone of the energy system in the 21st century will be spread across regional Australia.

The process of designing and constructing this new electricity grid is underway. We are replacing the energy from a small number of large and ageing coal fired generators with a combination of renewables, storage and gas generation. Essential Energy's network presently hosts approximately 1.5 gigawatts (GW) of utility scale renewable generation, with the largest single connection being the 145 megawatts (MW) Flyers Creek wind farm near Orange.

Over time this new electricity system will need to expand to provide energy for electrification, including the inevitable transition to electric cars and trucks, and hopefully to make new clean energy fuels that can be used to make essential products like plastics, fertilisers and steel, to power our modern world.

This is the biggest change in the history of Australia's and the world's energy systems. The development of these new, more widely distributed energy generators is already having a material impact on communities in regional Australia.

Some communities have concerns about these changes. Our shared challenge is to navigate a pathway that meets the needs of these communities and the nation's clean energy future.

Recent discussions around delays to the closure date of the Eraring coal power station in NSW highlight an emerging tension in this transition. It's pretty simple. We cannot close each of the remaining coal power stations until we have their energy and technical capacity fully replaced and operational. This means enough renewable generation, storage and back up gas peaking generators to perform the same role in the electricity system. 24 hours a day, seven days a week.

This isn't ideological. These coal generators that have anchored our electricity system for decades are approaching the end of their operational life. They won't run forever. We have a limited time to get the replacements organised.

The replacement renewable projects and transmission lines have been delayed by planning approvals, supply chain and labour constraints. The longer it takes the more serious the problem becomes.

We need to find innovative solutions to these challenges.

In response to this, the team at Essential Energy has conducted a six-month review of our existing sub-transmission network to see if existing infrastructure can be utilised to fast track some of this renewable development.

Because of the large distances we have to move electricity, we have nearly 10,000 kilometres of fully operational high voltage network capable of hosting utility scale renewable generation projects.

Following our assessment, we know we can help.

We have identified six locations across our network, called bulk supply points, which are able to host approximately 8.4 gigawatts of new large-scale renewable generation projects. These are located near Dubbo, Albury, Marulan, Tamworth, Yass and Wagga. The size of this connection capacity is similar to the size of the biggest renewable energy zone proposed for NSW and, contextually, compares to 12GW of peak electricity demand in NSW and 38GW across the National Electricity Market. It's a major opportunity to progress renewable generation projects quickly and at scale.

Using Essential Energy's existing sub-transmission network, large scale renewable projects can connect right now, subject to the need for works on the transmission network to minimise congestion. We would expect this would alleviate many community concerns because the connection infrastructure is already in place.

Using the existing distribution network will help accelerate new renewable generation projects, mitigate the risks of transmission planning delays and supply chain bottlenecks and, as a

consequence, help ensure adequate generation is in place as coal fired generators exit the system and help NSW meet its 2030 Electricity Infrastructure Roadmap targets.

This isn't just a concept. We have already connected around 1.5 gigawatts of utility scale wind and solar to our network, in addition to around 2 gigawatts of rooftop solar. We have another 2.5 gigawatts of large-scale storage in the connection pipeline.

There are around 30 projects connected or looking to connect to our distribution network. Utilising our sub-transmission network, we can host renewable projects up to around 200 megawatts in size, which includes all but the largest renewable projects.

Using the existing infrastructure to accelerate development is a practical and effective innovation. Not as glamorous as some new technology, but very real and very deliverable right now.

But to take advantage of these benefits, we need to make some technical changes to the way renewable projects are approved, and to how these six bulk supply points are treated.

Right now, Essential Energy has to process each connection enquiry from renewable developers separately. We would like to be able to coordinate or group renewables connections together to ensure we get the most out of the existing infrastructure, to ensure we get the technical details right and to minimise connection costs.

Renewable project proponents have to pay the full cost of connecting to the distribution network. The electricity market rules prevent us from making investments in our network to enable renewable projects to proceed, because, under these rules, these costs would be passed on to all of our regional customers and that wouldn't be fair. Also, the costs of providing distribution services can only be recovered from customer of the Essential Energy network, whereas everyone in NSW will benefit from these projects getting connected. Essential Energy's customers shouldn't have to pay extra for these new renewable connections.

The way this ends up working is that it will be cheaper overall for renewable projects to connect to the existing network. But it can cost more for an individual renewable project, especially the first one in a region to connect which will bear most of the network augmentation and other connection costs. This investment is needed so that the distribution network will continue to meet its reliability obligations to our customers as capacity is added to the system.

This creates a "first-mover disadvantage" in connecting to our network. The first renewables project will have to pay the up-front costs of connection, but then other projects can subsequently connect at a lower cost. And the electricity market rules currently prevent us from connecting these projects together.

There are at least two possible solutions to this. Firstly, those regions in our distribution network that have the capacity to host renewable projects may potentially be declared as additional renewable energy zones. That would afford these renewables projects the same treatment as other REZ projects. This would enable the grouping of the connection process, so that connection costs could be shared by all proponents and removes the first-mover disadvantage.

The second solution would be to develop an alternate funding mechanism that transfers these connection costs to all consumers in NSW, rather than regional NSW consumers. This could be drawn from a range of sources, including accessing concessional financing under the Rewiring the Nation Fund, or through the Consumer Trustee under the NSW Roadmap legislation.

While we have been thinking laterally and coming up with innovative solutions, it has become abundantly clear that the electricity market rules were written in another age, when these challenges and solutions simply didn't exist.

Using the existing distribution network to connect new renewable projects seems logical. But this confounds the existing regulatory regime, because it proposes using an existing asset to do a different job. Changing the rules will take time and risk becoming another new and unhelpful delay. While it would be great to have better rules, other solutions are likely to be easier and quicker.

The bottom line is simple: utilising the existing distribution network to connect new renewable projects will be cheaper for all consumers, faster, and reduce community push-back over new transmission lines. We don't disagree that those lines are required, but they will take time to build. It will help NSW meet its emissions goals and ensure there is adequate generation in place as coal fired power stations close. It's a sensible idea that requires some simple adjustments in the way we utilise these assets to make it work.

Rebuilding our energy supply system is a major challenge, but not an impossible one. We will deliver the greatest benefits to consumers if we accept that what we are doing is new, will at times require a new way of thinking about the problem, and we implement solutions quickly.

The advantage of re-purposing Essential Energy's existing distribution network is that it's a discrete opportunity that can be leveraged simply and expeditiously, if common sense and practical solutions are implemented. There are no losers.

Using regional distribution networks to connect renewable energy projects can open up a world of opportunities to deliver value back into these communities. Because ultimately, utilising the network more efficiently should make it cheaper for every customer. If regional Australia can be enabled to exploit the opportunity of hosting utility scale renewable generation while not compromising on what they value, then that could change the way those communities see the energy transformation.

We look forward to continuing to work with you all.