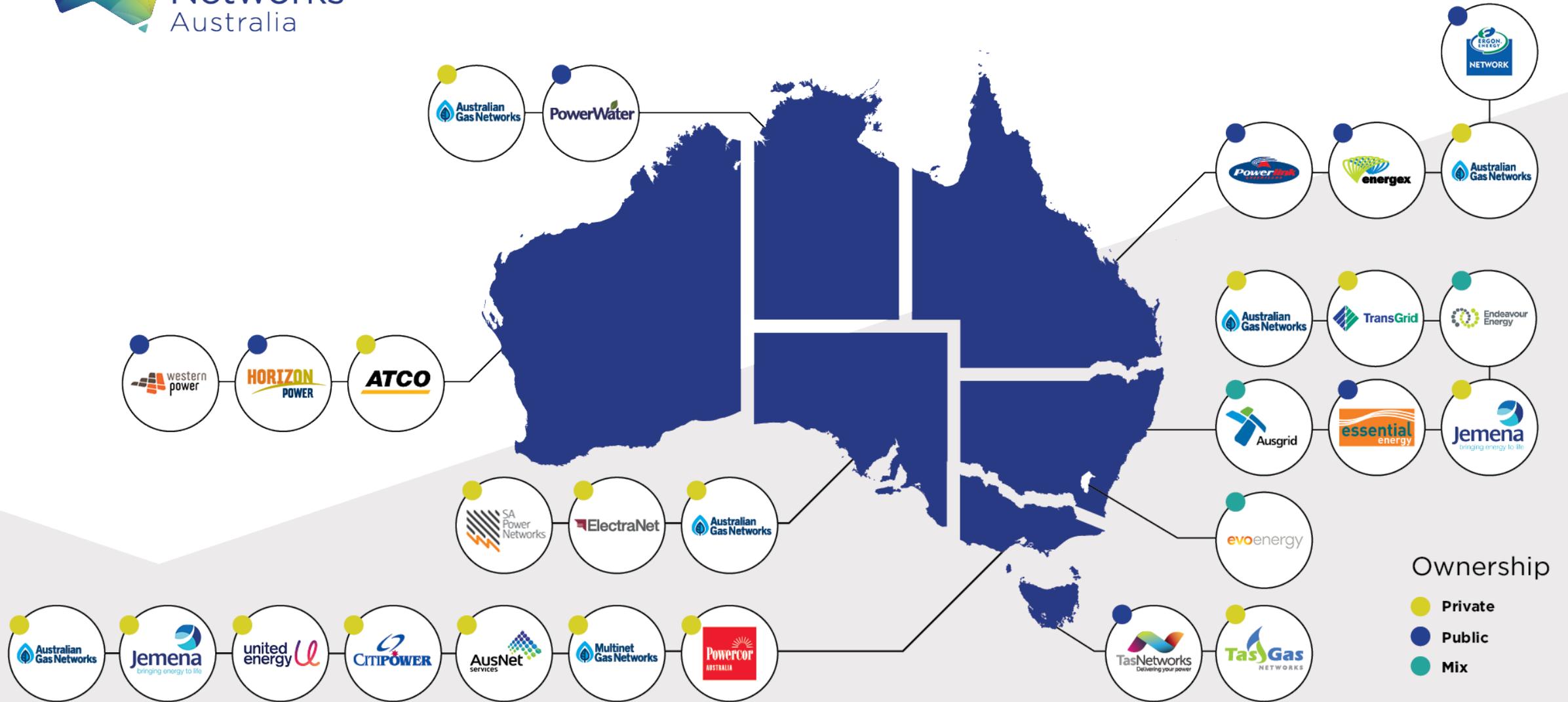


Energy Networks Australia Update

Future Energy Summit

Managing the transition to renewables from a networks perspective

1 July 2021



Agenda

1. Batteries and Solar
2. DSO Vision
3. Transmission
4. Dunkelflaute
5. Hydrogen and Gas Vision

AEMC Access, Pricing and Incentive Arrangements for DER

- » Customer-initiated process working together working together
- » Among other things, the rule change will clarify that distribution services are two-way.
- » Reform will help networks support the increasing number of customers connect solar and export energy
- » It does not introduce export charges but enables charges & rewards as a future option
 - Under revenue caps, any new charges would not increase revenue for DNSPs
- » Without ability for DNSPs to participate in storage ownership, solar export issues will grow

AUSTRALIAN ENERGY MARKET COMMISSION
HAVE YOUR SAY: MAKING ROOM FOR MORE SOLAR AND NEW TECH ENERGY
DRAFT DETERMINATION 25 MARCH 2021

The AEMC today released a draft reform package designed to open a solar gateway to the electricity grid. We can decarbonise faster and for less cost if we change the power system to allow more customers to connect solar and make it more worthwhile for them to install batteries. We've suggested a way to do that, but we want to know what you think.

There's an energy revolution underway
More than 2.6 million small solar owners have led the charge. This big, fast change will continue – within a decade, half of all energy users will be using some form of local energy option like solar.

But to keep up we have to use the system smarter
The system wasn't designed for power flowing both to – and from – consumers. Because of this, so much solar potential is locked away. Not everyone can export their solar energy because of daytime 'traffic jams' on the network. This problem doesn't affect all solar owners yet, but it's getting worse. If we don't act, the system will reach its technical limits. Then, power networks will have to severely limit power exports or build costly new poles and wires to cope with the new solar on its way. Either way, we will all pay, so we need a smarter, cheaper way to use the grid. The sun is free, but poles and wires are not, so planning ahead will avoid costly over investment and crisis solutions down the track.

What does a smart system look like?

- Better manages the flow of electricity in the power system, smooths out demand peaks and troughs over the day, gets more from the poles and wires we already have.
- Customer preferences drive network tariff design and the solar export services they get
- Works for everyone, whether they have solar or not, and distributes the benefits of solar evenly across the network. Every Australian deserves affordable, sustainable power.

What we're proposing

- Changing distribution power networks' existing incentives to provide services that help people send power back into the grid.** Gives networks a stronger reason to deliver quality export services that customers value. At the moment, there are no financial penalties for poor network export service and no rewards for good service.
- Officially recognising energy export as a service to the power system.** Gives consumers more influence over what export services their networks deliver and how efficiently they deliver them.
- Allowing power networks to develop new tariff options including two-way pricing.** Networks may reward you for sending power when it's needed and charge for exporting when demand is low. Investing in a battery would bring benefits. Options could include free export up to a limit or paying extra for access during busy times.
- Flexible pricing solutions at the network level.** Each network devises its own pricing structure based on customer preferences. There will be no blanket approach because different networks have different capabilities and customers and are subject to different government energy policies. Each plan must be approved by the energy regulator.

Open in...

“Empowering consumers to be a bit smarter about the way they use energy is absolutely the key.”

Andy McCarthy, CEO of RACV Solar

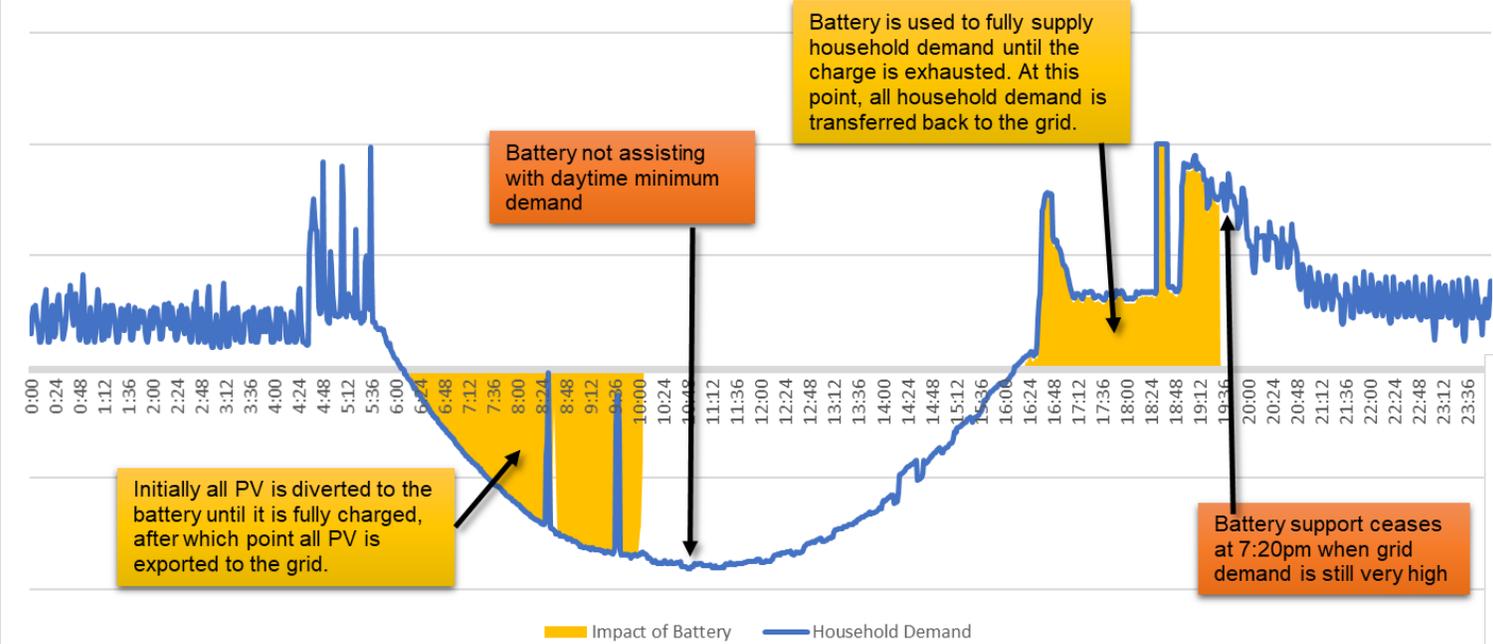
[\[Solar tariff reforms to drive smarter power use – AFR 26/03/21\]](#)

Solar + battery: what we see v. what we need

Impact of Battery on Household Demand

Present Behaviour

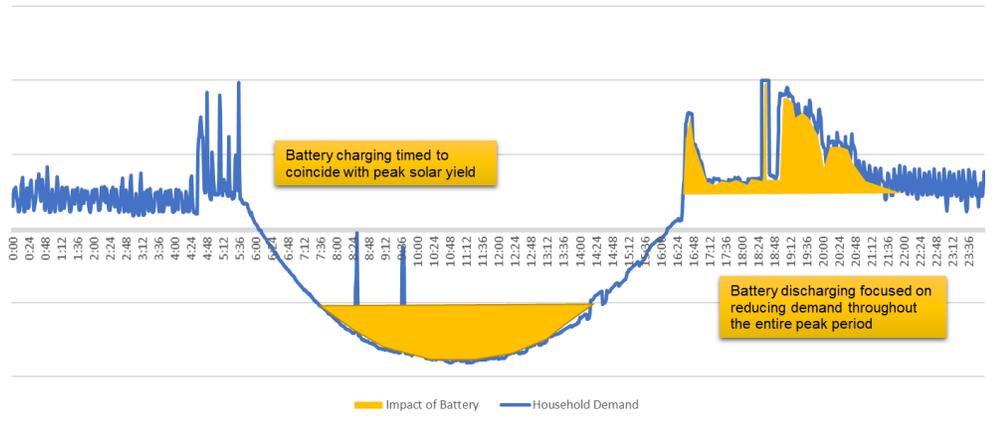
(Actual data from 14/02/18 - peak demand day)



Solar + Battery: a better way

Impact of Battery on Household Demand

Desired Response



To avoid the network peaks that drive investment, batteries can reduce local issues

Source: Powerlink analysis



Community Battery and Virtual Power Plants

- Network-connected community batteries are becoming regular features in suburbs and towns around Australia
- Changes to the access and pricing policies will allow more DER onto the grid
- To deliver a 1MW service we need either:
 - A 1MW network battery; or
 - 4.2MW of customer batteries



Distribution System Operator Vision

Network businesses have been contemplating what our future role is as distribution system operators (DSOs)

As a DSO we will dynamically manage capacity and operate the network to maintain an efficient, safe and reliable service while optimising value to our customers, the energy system and supporting the renewable energy transition. We will do this by:



Dynamic system operation

Planning, managing and optimising the distribution network and setting dynamic system operating limits to maintain a safe and reliable service.



Dynamic network pricing

Improving system affordability for all our customers through efficient network investments and encouraging efficient two-way utilisation of the network through dynamic network pricing.



Flexible access services

Providing a range of network access services to our customers in line with their individual needs, including the potential ability to trade network capacity in the future.



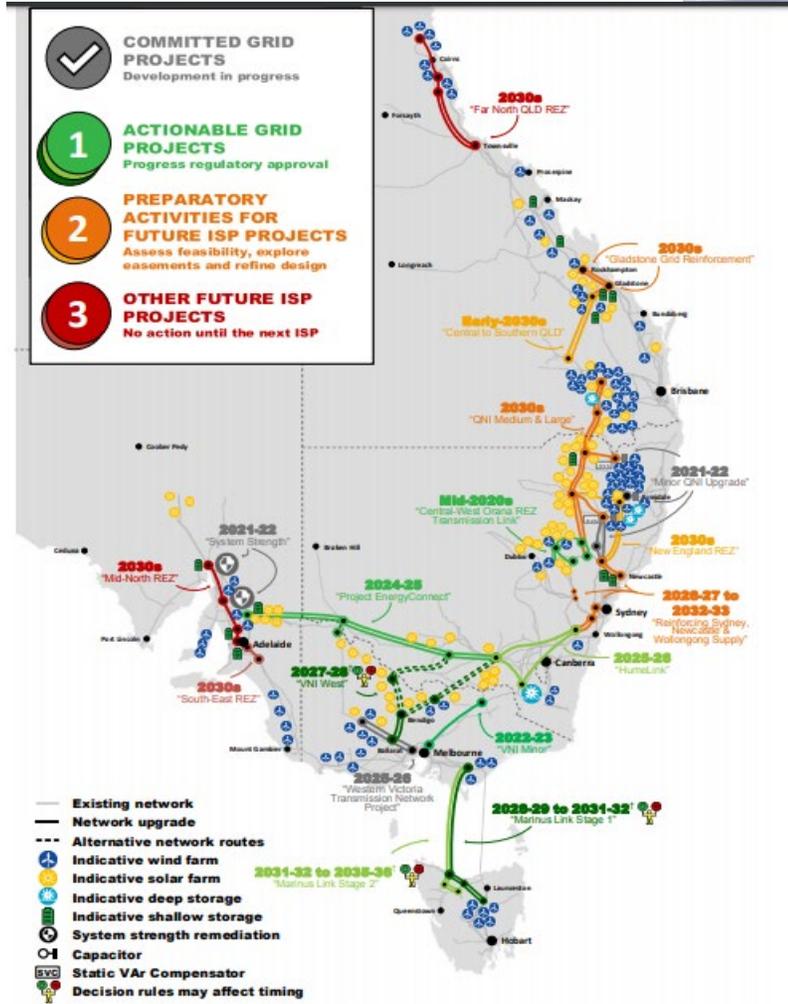
System services

Maximising the value derived from our assets and capabilities by providing new services and support to the energy system and to our customers.

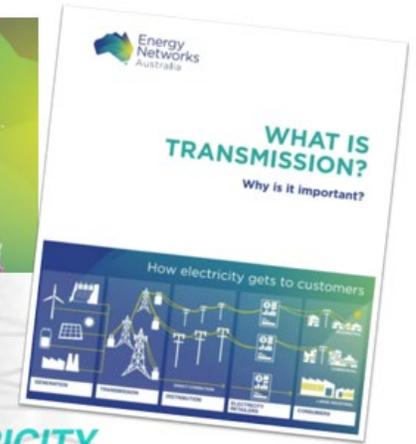
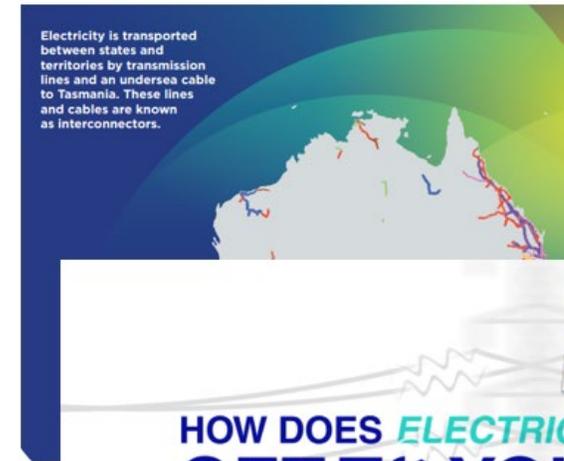
What a DSO doesn't do:

- » **Run energy markets.** The focus is instead on supporting DER participation in local and NEM energy markets as they evolve.
- » **Aggregate and bid customer resources into energy markets.** The focus is instead on supporting traders to do so through a flexible and reliable network service.

Transmission Social Licence – the challenge is real



As published in About Regional online



Western Victoria transmission network project slammed by farmers, mayor calls for consultation

ABC Ballarat / By Steve Martin and Jane McNaughton
Posted Wed 17 Jun 2020 at 3:58pm, updated Thu 18 Jun 2020 at 6:34am



Western Victorian farmers plan to fight plans to install 190 kilometres of high voltage powerlines through their communities (ABC News)

The Winter Problem: Dunkelflaute

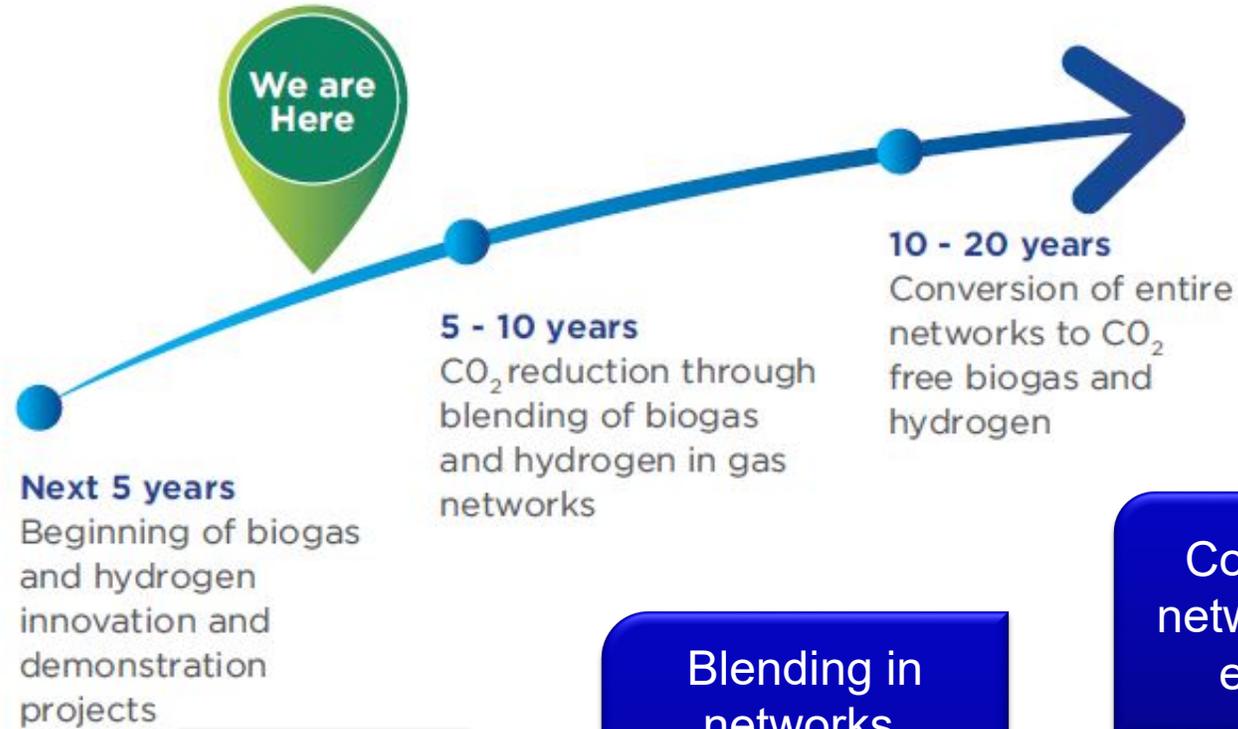
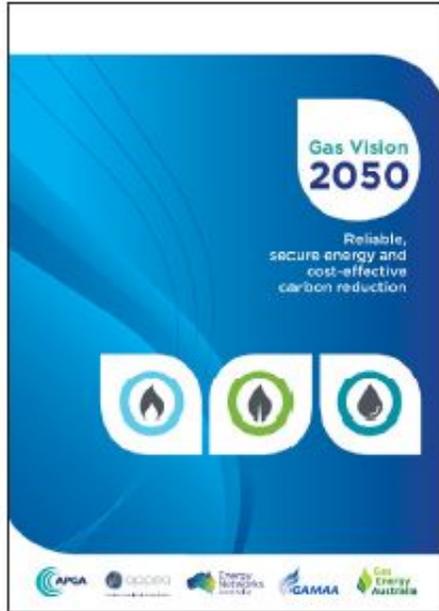
- » *Dunkelflaute* literally means dark lull i.e. no solar, no wind.
- » Grattan identified “the winter problem” as the key challenge to getting to 100% renewables:

The final stretch to zero is harder. The main challenge is ‘the winter problem’: demand for electricity is higher on average in winter, when solar output is lower.

- » Challenge is dunkelflaute = peak gas use.
- » So electrifying the existing gas heating load makes dunkelflaute harder and more costly to manage



Gas Vision 2050: industry's response to the Paris agreement



Next 5 years
Beginning of biogas and hydrogen innovation and demonstration projects

5 - 10 years
CO₂ reduction through blending of biogas and hydrogen in gas networks

10 - 20 years
Conversion of entire networks to CO₂ free biogas and hydrogen

Blending in networks.
100% in new networks.

Conversion of networks to zero emissions.



Hydrogen is happening around Australia

- » All states and territories have released hydrogen-specific strategies, outlooks or roadmaps
- » The [May 2021 short report](#) (CSIRO) estimated that at least AUD\$1.5 billion has been awarded/committed (or been made available) by Australian Governments, industry and research institutions to progressing clean hydrogen projects and supporting activities
- » H2 blending in existing gas network underway in SA and in development in Vic
- » Aus first hydrogen power generation in Denham WA

Australia: Hydrogen Projects by State and Lifecycle Stage

	Operating	Under Construction	Advanced Development	Under Development	TOTAL
Western Australia	1	4	3	11	19
Queensland	1	2	3	13	19
South Australia	1			3	4
Victoria	1	1	2	2	6
New South Wales		1	2	2	5
Tasmania				5	5
ACT	2				2
Unspecified				2	2
TOTAL	6	8	10	38	62

Notes: South Australia includes the Australian Hydrogen Centre project (though studies being conducted cover both South Australia and Victoria deployment opportunities); ARENA funding award to the project was to AGN/AGIG headquartered in South Australia (and this is chosen for convenience). Unspecified includes projects that have Australia-wide coverage at this stage of their development.

Source: [HyResource](#) – accessed 7 June 2021

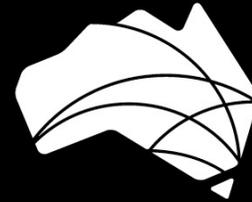


Energy Networks

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