

“Electricity storage: the critical electricity policy challenge for our new Government”

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Outline

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2. Is Government intervention in the electricity sector needed?
3. Should the Australian Government be involved in electricity transmission ?
4. Storage and transmission are essential for decarbonisation but $S \gg T$?
5. Is a *national* storage policy likely to be valuable?
6. The Renewable Electricity Storage Target (REST) proposal.
7. REST versus Capacity Market ?

Context

- ▶ The world is in the midst of an energy supply and price shock that may come to rival that of the 1970s oil shocks.
- ▶ Australia has been late to this crisis, but wholesale electricity prices are at extraordinary levels and retail electricity prices rise may soon follow.
- ▶ Rapid GHG reductions and RE expansion can now be expected. Commonwealth promises 43% GHG reduction (on 2005 by 2030) and 82% RE by 2030. All State governments want bigger cuts (except Queensland), although the coal states have smaller RE targets.
- ▶ Particularly rapid and deep GHG reductions are expected from the electricity sector: easier and cheaper than in most other sectors.
- ▶ Centre-piece of the new Government's policy for the electricity sector is the creation of a \$20bn Rewiring the Nation (RNC) corporation. What should it do?

Is Government intervention justified?

- ▶ All Governments have emission reduction policies but all refuse to allow greenhouse gas emissions to be priced in electricity. Major implications:
 - ▶ Governments (and investors) can't rely on electricity prices to signal the value of GHG emission scarcity consistent with Governments' GHG reduction policy.
 - ▶ Regulators unable to account for emission prices in their assessment of transmission (or distribution) expansion.
- ▶ Government intervention to achieve decarbonisation goals is unavoidable (and probably needs to be done behind closed doors).

Should the Australian Government be involved in transmission?

We think not, because:

1. Cwltl lacks the local information needed to know when, where and how much;
2. Relatively weaker fiscal constraint (than States) makes profligacy more likely;
3. States control access to land and have Constitutional role in electricity provision.
4. Cwltl has little expertise in consultative engagement needed to win local community support.
5. The States are already onto it.
6. The co-ordination role that the Cwltl can play is increasingly less valuable as the power system balkanises and localises in response to technology change (in VRE and storage)
7. If inter-regional interconnection is valuable it should be left to the States to agree, they have incentives to reach agreement (or not, if costs fall short of benefits)
8. Transmission is affordable and just 14% of the present cost of full decarbonization (according to AEMO)

For full decarbonization, storage >> transmission

- ▶ AEMO says to fully decarbonise electricity supply, storage capacity will need to grow to 59 GW (20 times current).
- ▶ Transmission system will need to expand by 10,000km (about a fifth longer than the existing network).
- ▶ Capital expenditure on transmission is smallest part (14%) of the capital expenditure needed to decarbonise the electricity sector (about one third is needed to expand storage and the remainder to build more renewable generation).
- ▶ In dollar terms, AEMO suggests complete decarbonisation by 2050 has a present cost of \$87bn of which \$75bn on generation and storage and \$12bn on transmission.

Both transmission and storage are needed, but storage is the bigger challenge. We think Cwlth can play useful role in driving storage uptake.

Is a national storage policy likely to be valuable?

1. Major changes (coal closure) but path is not clear. Storage has value as insurance.
2. Decarbonisation requires government intervention (emissions not priced): market would underprovide if left to itself
3. Storage is a necessary complement to VRE in decarbonising electricity supply. A storage policy therefore has a rationale as an element of emission reduction policy.
4. Storage policy provides confidence in the demand for storage and hence in its supply so will help to drive cost reductions through development of supply chains.

Renewable Electricity Storage Target (REST) design objectives

1. Pay for availability, not output. Output should be compensated in the energy market.
2. Minimise discrimination between competing forms of storage on the basis of where that storage is located (e.g. behind-the-meter versus grid—connected in one state rather than another).
3. Do not discriminate on the basis of the storage duration of the device (i.e. how long the device is able to produce its maximum output for).
4. Do not discriminate between stationary storage or mobile storage (e.g. electric vehicles with the ability to discharge their batteries to the grid versus fixed batteries).
5. Provide subsidy that is inversely related to the income that storage devices will obtain from the electricity market.
6. Establish a rivalrous process to discover the most cost-effective storage technologies.

How will REST work? 1/2

1. Certificates are specified per unit of power (kilo-watt) that the storage device is able to reliably discharge to the grid.
2. Eligible storage devices:
 - ▶ a) commissioned after a starting date (which must be in the future so as to ensure additionality)
 - ▶ b) able to synchronise to the electricity grid and capable of producing their full capacity within 5 minutes, for at least one hour
3. Eligible storage devices are able to create certificates for a defined period, say 10 years.
4. AEMO would advise the Government periodically – every five years – on the annual Storage Certificate Target.
5. Retailers and directly connected large customers will be obliged to surrender a specific volume of these certificates annually with the volume determined based on the grid-supplied electricity that they sell/buy.

How will REST work? 1/2

1. REST certificates can be traded freely.
2. As with the RET, failure to surrender certificate obligation attracts a penalty per certificate (ceiling price).
3. Penalty price to be set at level that, if paid every year for 10 years, would be sufficient to cover around 25% of the capital cost of efficient storage device.
4. Voluntary certificate surrender allowed.
5. Emission-intensive trade-exposed entities will liable.
6. The Commonwealth could potentially reimburse consumers for some/part of certificate cost.

Why REST instead of capacity payment (in the NEM) ?

1. Administrative infrastructure already exists; highly regarded and can be adapted for storage. Implementation risk unlikely to be large.
2. Storage market, per AEMO, likely to be dominated by distribution-connected and behind-the-meter generation. Considerable development of National Electricity Rules need to accommodate small scale storage.
3. REST to be established through Commonwealth legislation – much quicker and simpler than if established under the National Electricity Law.