CLEAN ENERGY INVESTOR GROUP

AEMC PRE-DETERMINATION HEARING - 4 DECEMBER 2019

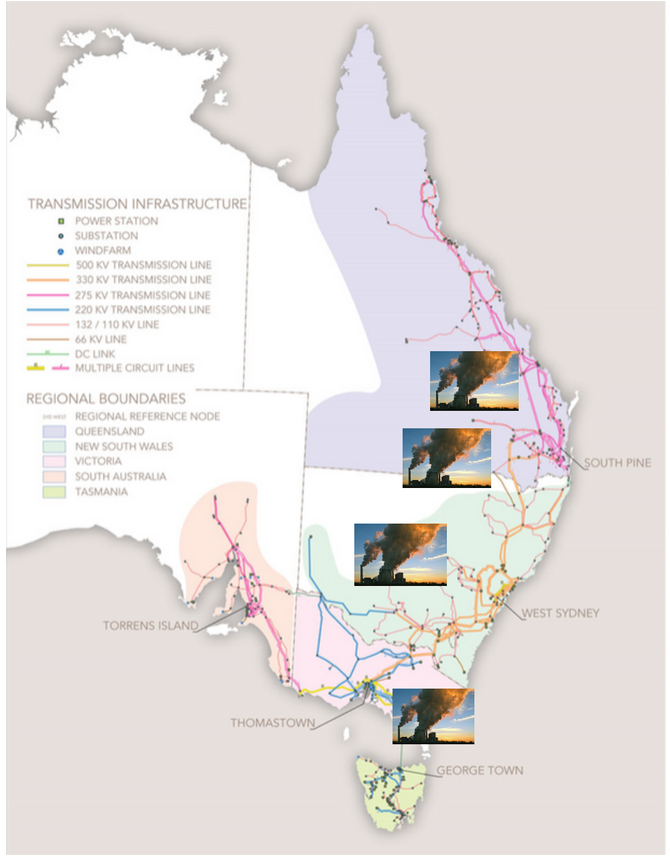
CLEAN ENERGY INVESTOR GROUP

WHO WE ARE

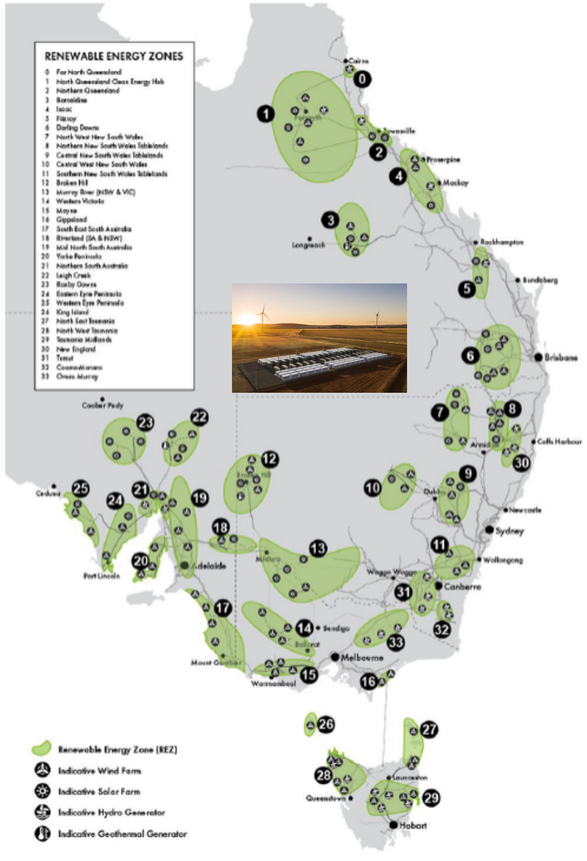
- Formed in July 2019
- Comprising 20 investors owning 72 power stations, comprising 6.5GW of installed capacity and a portfolio value of $11 billion - collectively the second largest generator in Australia
- 10GW pipeline of development projects available to populate the ISP
- Members include pension funds, infrastructure fund managers, sovereign wealth funds and IPP's
- Developed and delivering an education, advocacy and stakeholder engagement plan related to the MLF rule change process being conducted by AEMC

WHAT'S THE PROBLEM?

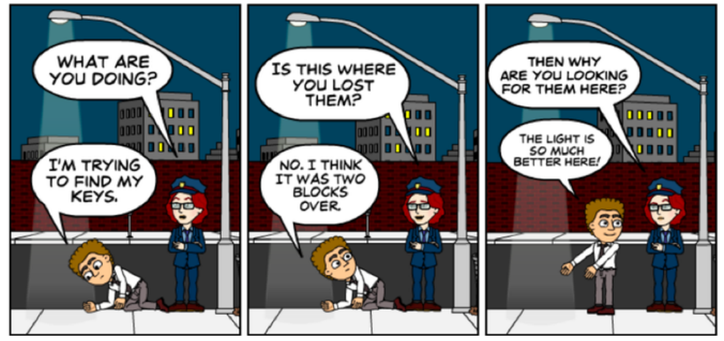
The rules designed for this version of the NEM:



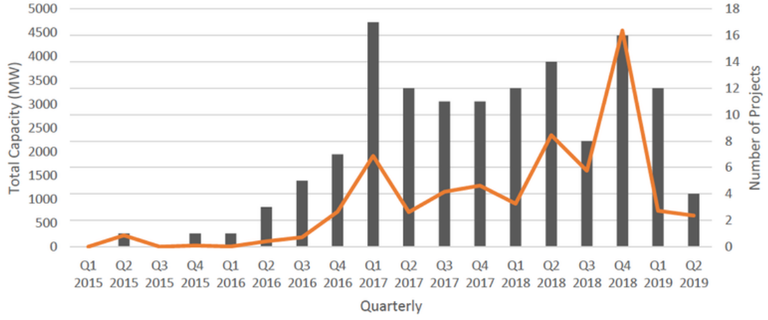
Are not proving fit for purpose for this version of the NEM…



So the Streetlight Effect…



Is causing RE investment to fall off a cliff….



Source: Clean Energy Council September 2019

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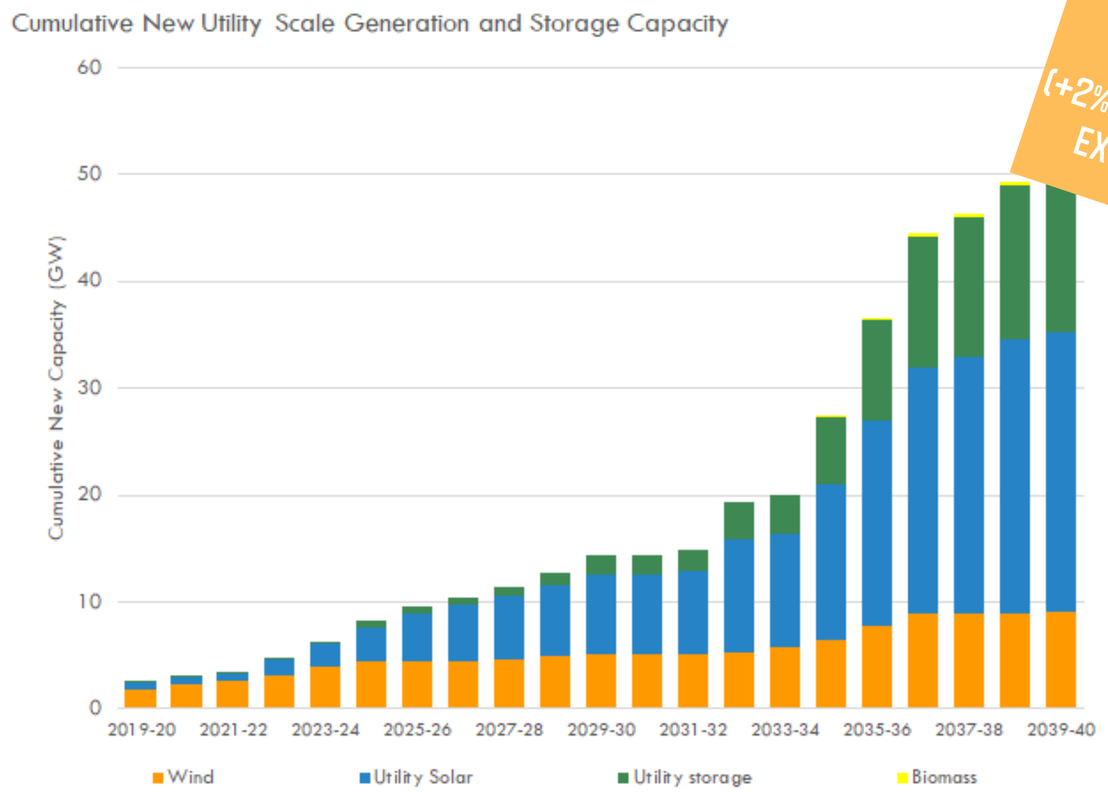
WHAT'S THE PROBLEM?

According to the AEMO ISP we need to deliver 35GW of new generation and 15GW of storage by 2040



MLF impact on delivery cost of the ISP*

OPTION 1:
CEIG MEMBERS KEEP INVESTING & INCLUDE (+2%) MLF PREMIUM^ = $430 EXTRA PER CUSTOMER

OPTION 2:
CEIG MEMBERS STOP INVESTING & LEFT TO OLIGOPOLY^^ = $1,075 EXTRA PER CUSTOMER

BY 2040, NEED TO INVEST $72 BILLION TO DELIVER THE ISP

** CEIG calculations based on AEMO's 2018 ISP*
^ CEIG survey of WACC and risk premiums
^^ 4-5% cost of equity delta to CEIG

MLF VS ALF

1 Marginal loss factors (current method)

Served us well for first 20 years of the NEM. No longer fit for purpose

This method sends locational signals for prospective generation investors and developers. It is an annual, ex-ante forecast value based on the marginal losses between a generator and the regional reference node (the place in each region where a local wholesale price is set.)

Marginal loss factors represent the value of electrical energy lost when the next (marginal) unit of electricity is transmitted and has historically been relatively easy to forecast. More recently the annual large changes in location and volume of new generation is causing the methodology to produce highly unpredictable, volatile and unhedgeable results - up to 27% change per annum in some cases.

This volatility has caused investment in new generation to collapse to 150MW this year from 4,500MW last year*.

**AEMO 2020/2021 Indicative MLF Publication*

Fit For Purpose Challenges of MLF:

- Difficult to forecast
- Volatile
- Can not hedge

2 Average loss factors

Improves investment certainty and keeps consumer prices lower

During the current transition phase of the NEM, ALF will reduce the annual volatility of loss factor calculations.

The benefits of moving to ALF:

- keeps consumer prices lower than staying with MLF as demonstrated by independent modeling / analysis
- maintains locational signaling
- is "no-regrets" on the journey to Post-2025 NEM reform
- ensures investment can restart whilst the way forward on ISP is determined.

Changing to ALF:

- Substantially reduced volatility of loss factors year on year
- Dampens impact of errors inherent in long-term forecasts
- Preserves the relative locational signal
- Creates sufficient certainty to continue to invest
- Is used in many other markets, e.g. Canada, USA & UK
- Delivers improved long term customer outcomes

AEMC'S DRAFT DETERMINATION

The AEMC argued strongly for (i) dispatch efficiency and (ii) locational signalling as the basis for maintaing the status quo MLF position

(i) Dispatch Efficiency

- This is supposed to be the main benefit of MLFs, especially dynamic ones.
- In economic theory this may be true, but in the real world the benefits are demonstrably minuscule.
- This is because price is not distributed on a smooth curve like in theory. Bids are stepped and non-contiguous. Generators don't necessarily bid their short run cost either.
- This means for almost all intervals there is no difference in dispatch outcomes and marginal generation for any loss factor methodology.
- For the intervals where we can detect a change in marginal price setter the price is likely to be very similar - two similar bids with two similar loss factors means a negligible change in price.
- There is very little difference in dispatch whether we use dynamic, ALF/MLF or simply a fixed value for everyone as fuel cost is 97% of the marginal price. As we move to higher renewable penetrations and more frequent periods of $0 bids setting price the accuracy benefit of whichever loss factor methodology we choose becomes even less relevant.

(ii) Locational Signalling

- The academic thinking goes that accurate (be it MLF or DRP) loss factor representation provides a signal about where to build new generators. However dispatch outcomes provide no leading indicator for investors. The potential increase in losses for a new generator is not at all obvious just by observing historical loss factors.
- The current locational signals MLF provides are simply saying "do not invest in the NEM, unless it's right next to a capital city".
- In the new distributed NEM (with and without REZ's) building wind and solar where the resource is strong, where land is cheap, and where it benefits the community the strongest is the best option for consumers as the resource intensity benefit outweighs the transmission loss cost.
- Based on recent announcements by NSW, most new transmission and therefore generation locational signalling will be achieved through a government-led central planning approach to the REZ's.

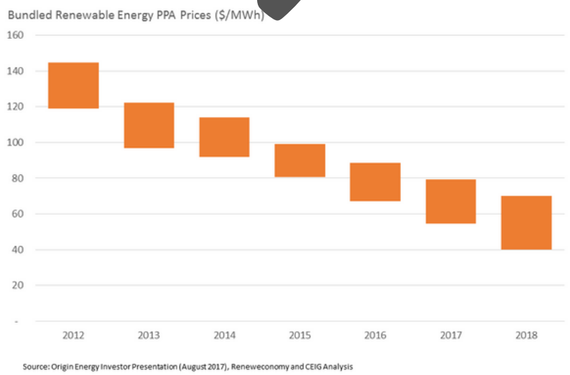
Most importantly, no quantitative economic or financial analysis was undertaken by AEMC to demonstrated that the (i) disptch efficiency and (ii) locational signally benefits of MLF outweigh the supply side benefits of ALF. When it comes to making a decision in the best interests of consumers and the NEO, this MUST be done.

IN SUMMARY

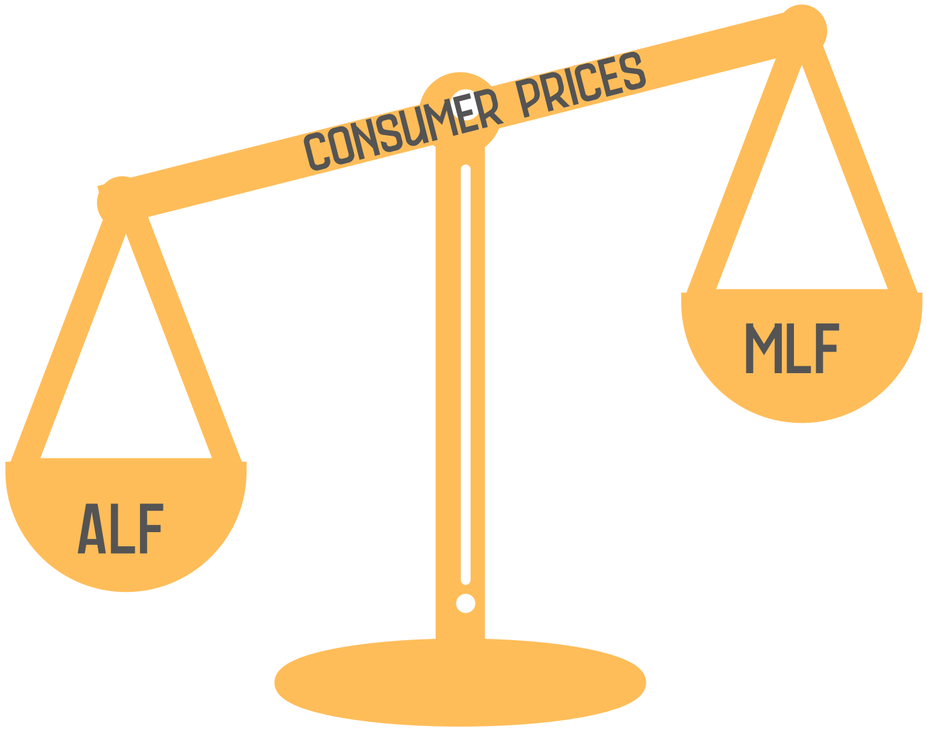
CEIG & Baringa quantitative modelling shows ALF is better for consumer prices and the NEO. We remain open to being proven wrong…..

Bid stack effect*:
$10-25p.a. per customer

Supply-side effect:
~$100p.a. per customer



Source: Origin Energy Investor Presentation (August 2017), Reneweconomy and CEIG Analysis



Dispatch efficiency effect:
? per customer

Locational signalling effect:
? per customer

IRSR / TUOS netback effect:
? per customer

PROPOSED NEXT STEPS

The CEIG and its members want to work with AEMC to quantitatively analyse the relative merits of the MLF and ALF frameworks. Specifically:

- Work with AEMC and AEMO to establish a reference data set
- Agree framework to assess impact on operational efficiency
- Agree framework to assess impact on efficient investment and locational signals based on expected approach to REZ delivery
- Agree framework to assess impact of supply side (driven by investor certainty) effects
- Share and review results of analysis

Thank you for your attention!
Q&A?

APPENDIX

States with high new renewable energy investment and penetration have falling prices ($/MWh)*, but most volatile MLF…

YEAR	NSW	QLD	SA	TAS	VIC
2015	33.85	59.84	37.41	37.58	28.29
2016	51.60	59.99	61.67	102.70	46.14
2017	81.22	93.12	108.66	75.40	66.58
2018	82.27	72.87	98.10	86.98	92.33
2019	88.56	80.29	109.80	90.01	109.81
2020	84.34	64.30	68.63	75.61	92.55
RE Penetration					
Wholesale:	17%	9%	51%	95%	17%
Rooftop:	20%	36%	35%	15%	18%

* *AEMO:* https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Data-dashboard#average-price-table