Submission to Environment and Communications Legislation Committee
Ref:
CEFC Amendment CCS Bill 2017

Dr Noel Simento – Managing Director

Introduction

ANLEC R&D appreciates the invitation and opportunity to provide a submission to the Environment and Communications Legislation Committee on the Clean Energy Finance Corporation Amendment (Carbon Capture and Storage) Bill 2017.

ANLEC R&D endorses and supports this amendment as one additional step in policies and legislation that takes a technology neutral approach to emissions reduction from the energy sector. Carbon Capture and Storage (CCS) is a proven low emissions technology that can make significant in-roads to reducing emissions from the electricity generation and industrial sectors of the Australian economy. Including CCS as an eligible technology for investment by the Clean Energy Finance Corporation, provides access to capital on terms that might not otherwise be available from commercial markets due to perceived policy risk.

Carbon Capture and Storage is being adopted at scale internationally. USA and Canada have shown that the technology can be deployed at scale for power generation purposes. Their respective operations at Petra-Nova[1], Texas and Boundary Dam[2], Saskatchewan are delivering access to low risk pathway to an affordable, reliable and cleaner energy system.

While giving CCS eligibility for financing from the Clean Energy Finance Corporation (CEFC) is a good start – with current rules - it remains unclear however, how this eligibility will deliver a technology neutral incentive for investment in the technology.

Who is ANLEC R&D?

Australian National Low Emissions Coal Research and Development (ANLEC R&D) is a Commonwealth Partnership with the Australian Coal Industry to enable and accelerate the demonstration and deployment of low emissions technologies for coal fired power generation. Our primary role is to deliver the scientific platform on which low emissions coal technologies such as carbon capture and storage might deploy sustainably for Australia.

ANLEC R&D has invested over $100M in research and development supporting Carbon Capture and Storage in Australia. In the last eight years of operation, it has delivered over 100 reports and publications that assist Australian proponents to deploy the technology at commercial scale.

The following sections outline why it is important that the proposed amendment is adopted and offers for consideration how it might be enhanced to provide effective investment.

Addressing Australian Emissions Reduction Commitments

The share of reductions to electricity and industrial greenhouse gas emissions must be viewed in the context of Australia's energy cost competitiveness. This is often referred to as reliability and affordability. There is mounting evidence to suggest that in the pursuit of a low emissions technology objective we are increasingly compromising our energy competitiveness economy wide. There are several independent sources[3] (See Figure 1) that now report Australia has one of the highest costs of electricity among OECD countries – while paradoxically we are one of the most abundant of energy resource nations.

[1] https://www.globalccsinstitute.com/projects/petra-nova-carbon-capture-project.
[2] http://www.saskpower.com/our-power-future/carbon-capture-and-storage/boundary-dam-carbon-capture-project/
[3] Australian Financial Review, http://www.afr.com/news/australian-households-pay-highest-power-prices-in-world-20170804-gxp58a.

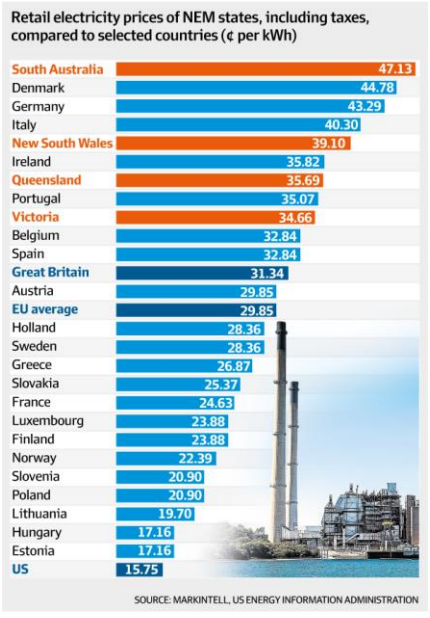

Figure 1: Selected international electricity price comparison

To remain a competitive economy, it is therefore incumbent on our policies and regulation to facilitate the least cost route to lower emissions for the Australian energy sector. To chart this course no single technology that delivers lower emissions should be excluded from making its contribution to achieve a low emissions future.

By allowing CCS as eligible for investment by the Clean Energy Finance Corporation, it allows the largest section of Australian energy production – both Coal and Gas – to respond with low emissions solutions.

The Case for CCS from Fossil Fuels

Carbon Capture and Storage remains a competitive candidate for the least cost path to a low emissions electricity grid.

The National Electricity Market is transforming to accommodate increasing proportions of variable renewable energy (VRE) sources. While this occurs, it is also evident from several jurisdictions eg: South Australia, Germany, UK that there is a vulnerability to grid reliability[4] (see Figure 2). It is especially true if the transition is not managed with sufficient investment in the supporting infrastructure to deliver the required grid stability services.

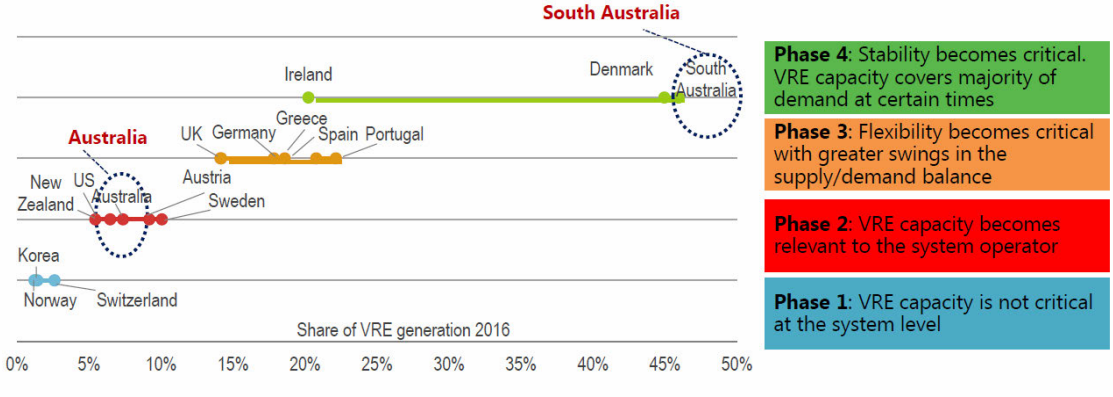

Figure 2: Stability becomes critical at VRE above 45%

[4] Dr Fatih Birol, IEA Executive Director, (Feb 2018), Australia's position in global energy: IEA In-Depth Review 2018

Work commissioned by ANLEC R&D and several other independent agencies[5] [6] show that:

a) ***Clean energy costs more:*** The total grid system cost for cleaner energy production is higher than business as usual. This is true even for renewable technologies as they need to be supported by ancillary grid services and development.

b) ***Grid Flexibility and stability become critical***: At about 45% renewables penetration of the grid, the nature of investment to support the energy system increases substantively to where CCS is considered to be among **the lowest cost options** for deployment. (see Figure 3)

Recent studies underway in ANLEC R&D show that - even with foreseeable cost reductions in all energy technologies - only CCS can deliver the deepest de-carbonisation ambitions in a "net zero emissions" future foreshadowed for the period beyond 2050.

More importantly, the asset deployment window to meet Australia's committed Paris target in 2030 is closing. Assessment of the Australian NEM suggests that the deep cuts afforded by CCS will increasingly become a necessity if we are to succeed.

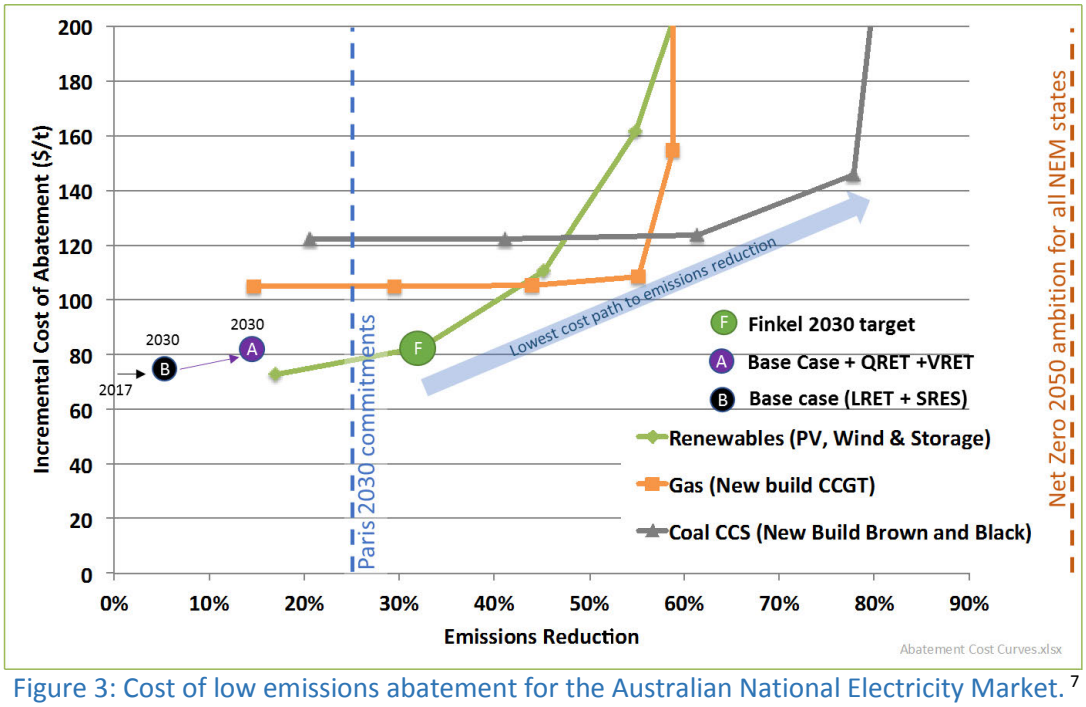

Figure 3: Cost of low emissions abatement for the Australian National Electricity Market. [7]

Queensland has announced a renewable energy target of 50% of its demand to be met by renewables by 2030. Victoria has announced a renewable energy target of 40% of its demand to be met by renewables by 2025. In a loosely interconnected grid like Australia both these targets will increase the total system cost. It will also make their state grids vulnerable if there is not sufficient investment in services to provide grid stability. Figure 3 shows that even if these two state targets are successfully met (reference point A in Figure 3), it still does not approach Australia's committed COP21 targets for emissions reduction.

[5] Godfrey, B., Dowling, R., Forsyth, M., Grafton, R.Q. and Wyld, I., (2017), The Role of Energy Storage in Australia's Future Energy Supply Mix.

[6] Boston A., Bongers G. (2017) Managing Flexibility whilst Decarbonising Electricity – The NEM is changing

[7] Boston A., Bongers G. (2018) Private communication, Progress report to ANLEC R&D

To achieve the required reductions in the Paris 2030 timeframe, CCS offers energy generation capacity, grid services for stability and emissions reduction at the scale required to make the target achievable.

As variable renewable energy penetrates the market, the total system cost increments are likely to be smaller with CCS than without it.

The Next Steps

While giving CCS eligibility for financing from the Clean Energy Finance Corporation (CEFC) is a good start – with current rules - it remains unclear how this eligibility will deliver a technology neutral incentive for investment in the technology.

Current market mechanisms are discriminatory against low emissions solutions from fossil fuels. While the renewable energy sector has access to RE certificates that might underwrite a business case for current commercial deployment, CCS has no analogous market to valorise large gains in energy efficiency (CO_2 avoided) or CO_2 stored.

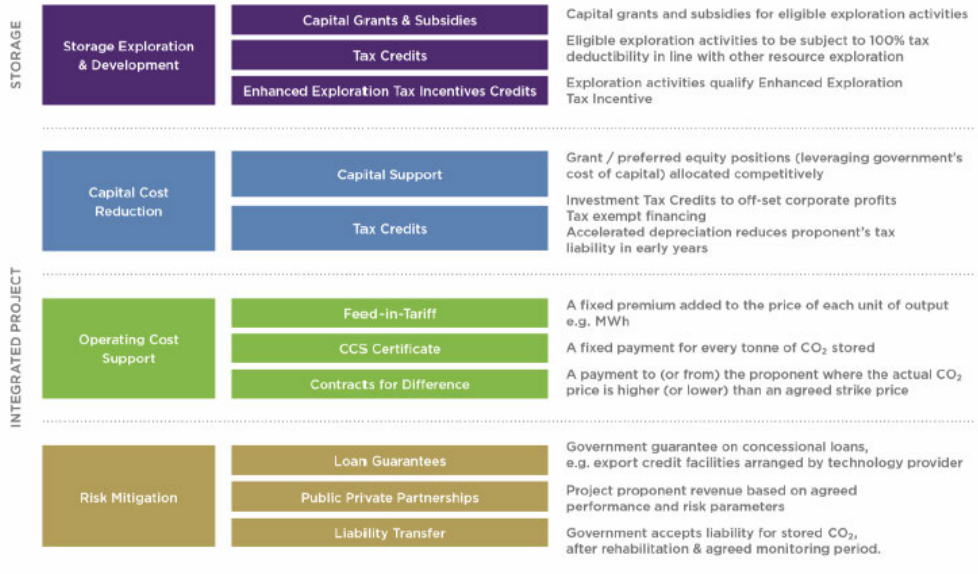

Figure 4: Potential support mechanisms for early mover CCS Projects

The large capital investment required to deliver the substantive generation capacity and the economies of scale for such energy supply would require the CEFC to develop additional investment criteria. These must allow for the emissions reduction from CCS to compete on equal footing for CEFC investment. Such changes are recommended, and measures may need to go beyond concessional loan arrangements to direct capital grants or similar instruments. The Committee is referred to the Australian CCS technology Roadmap[8] (Figure 4) which documents candidate financial structures and instruments that will be conducive to investment in CCS.

Conclusion

Re-establishing Australian energy competitiveness in a low emission future will require technology neutral policy and regulation. These need to create investment conditions that deliver the lowest cost energy supply relative to our economic competitors. Affording technologies like CCS equal opportunity to benefit from emissions reduction

[8] Greig C., Baird J., Zervos T. (2017) Energy Security and Prosperity in Australia - Financial Incentives for the Acceleration of CCS Projects

support mechanisms will ensure we have the best prospect to remain energy cost competitive, maintain and grow our export markets and meet our international commitments to emissions reduction.