

# Developing a Low Carbon Network (LCN) Energy Co-operative model for the ACT.

*A new model needs to be adopted that accelerates our response to meeting our moral responsibilities.*

*Dr Shane West*



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## Executive Summary and Recommendations

There is a moral responsibility to maintain a stable, secure and cost efficient grid supply to Australian customers both residential and business. At the same time it is essential to balance this with the need to eliminate as much fossil fuel consumption as possible whilst maintaining social cohesion and standards of living. The solution needs to be more than economically sound. It needs to be economically sustainable. The ability to generate revenue by the formation of an ACT Low Carbon Network (LCN) will enable future renewable energy technologies to be incorporated and developed in the ACT.

Without creating an LCN revenue stream, the likelihood of technology growth in the renewable field and creating a renewable hub as the ACT envisages, will be severely restricted. Electrical consumption will increase with EV's and digitalisation. Our communities and economy can benefit if we now develop an independently generated smart grid, capable of operating with intermittent renewable energy and micro grid supplements.

Based on the sound economics of creating an energy revenue stream via the development of an LCN, recommendations to the ICRC include:

- Adopting a new network and retail model for the ACT. The ACT Government through Icon Water and ActewAGL to take control of the transmission and generation of electricity to the ACT Network by the formation of a Co-operative Energy Low Carbon Network (LCN).
- It is proposed that the ACT Government and the ActewAGL partnership work with AGL to reallocate funds for the proposed 1000 MW Dalton open cycle gas turbine and covert this into a revised LCN project that has a CCGT Power Station of 500 MW located at Williamsdale ACT and a battery storage peaking plant of 250 MW at Dalton operating on a 5 minute price and call service. The battery storage is to be fed by new solar farms built along the LCN.
- Policy and legislation on national fugitive emission monitoring and abatement should be enforced with the major gas producers funding this by contribution to a national sinking fund based on the amount of wells and production output.
- Develop appropriate policy. Support for a carbon intensity Emission Trading Scheme. No fracking near water reserves and no CSG on agricultural land. Utilise conventional gas ( Bass Strait has a 100 year supply which will be sufficient for transition)
- Work with the State and Federal Government to introduce a 15% domestic gas reserve to supply the LCN, based on the Western Australian model and US 15% domestic gas supply reservation.
- Inter-governmental partnerships and selective PPP's should be explored for the LCN network with integrated electrical transmission and associated gas pipeline and gas feeds from appropriate transparent gas producers and suppliers.
- Appropriate ethical investment instruments should be drawn up for members (Governments of all levels, Community groups operating micro grids, institutions and businesses) to adhere

to. The LCN has as its main objective to create a Co-operative Energy LCN delivering stable secure and cost efficient electricity to members with the focal aim of reducing emissions to meet the 2030 and 2050 targets.

## Introduction

On the 14 of November 2016, the ACT Government joined a leading group of sub-national governments from around the world to sign the global Under 2 MOU (Memorandum of Understanding) that is committed to reducing greenhouse gas emissions to a level consistent with staying under two degrees.

To meet our imminent response to climate change goals and the signed Under 2 MOU the ACT Government must address the fact that it sources its baseload electrical supply from the TransGrid group who supply the transmission of electricity to the ACT transmission bulk supply point and that service is using 80% coal fired generation.

Apart from meeting the global response there is the need to meet the electricity needs of the Australian population and in particular the ACT. The ICRC draft report states the overarching objectives as:

“to promote the efficient investment in, and efficient operation and use of regulated services for the long term interests of consumers in relation to the price, quality, safety, reliability and security of the service.”

Under the Electricity Transmission Supply Code July 2016 a requirement listed under section 4.1.1 (d) from 31 December 2020, provide continuous electricity supply at 375 MVA to the ACT 132 kV network immediately following a single special contingency event and agreed maximum demand within 48 hours of this event.

After many years of planning and several disallowable instruments issued to meet a continuous security of supply for a second bulk supply point to now move from a finish date of 2012 to 2020 gives rise to issues of security of supply not being met in a timely manner. In consideration of meeting all of the ICRC objectives and functions and the overarching functions in particular a pricing model is now required to meet these urgent objectives. To move the ACT to a Low Carbon Network (LCN) to meet our 2030 requirements a transition plan with a sunset of fossil fuels needs to be initiated immediately.

It is proposed that the ACT to take ownership of its own transmission and generation with a 500 MW Combined Cycle Gas Turbine (CCGT) power station built and operating within three years at the Williamsdale second bulk supply point. Baseload capacity of a 500 MW generator couples with a growing renewable contribution to a LCN provides electrical supply requirements for the ACT and surrounding SE region operation and covers the intermittency of local renewables and the development of smart and micro grids for Canberra.

It is proposed that the ACT Government and the ActewAGL partnership work with AGL to reallocate funds for the proposed 1000 MW Dalton open cycle gas turbine and convert this investment into a revised LCN project with a 500 MW CCGT power station at Williamsdale ACT and a battery peaking plant at the chosen Dalton site operating a 250 MW battery storage, operating on a 5 minute price and call service. The battery is to be fed by new solar farms built long the LCN.

**With a CCGT plant at Williamsdale and the continuing addition of renewables generating electricity, security of supply for the SE region will be resolved; cost of energy purchase will be lowered by the ActewAGL being the generator and local LCN TNSP provider. Gas will immediately reduce at least another 40 % of emissions compared to supply by coal generators and the CCGT will provide a transition ability to phase out completely fossil fuel dependency when the technology is capable.**

The Finkel preliminary report in December 2016 (Independent Review into the Future Security of the National Electricity Market) Finkel stated that gas is **an essential fuel in the energy market transition. and**

**From the ICRC draft report, the ACT Network costs are 43% of total costs projected by the AER. 15% EEIS. The remaining 42% + Wholesale electricity cost (energy purchase).**

The report states that: *“The main costs where the retailer has control relate to hedging, retail operating costs and retail margin allowance. However, as depicted in Figure ES.1, retail operating costs and retail margin allowance only account for 12.27 per cent of the total costs and hedging costs are a small but necessary component of energy purchase costs.”*

The basis of the present operating model has suggested that the retailer has little margin to adjust operating costs. This needs to be explored further. The wholesale energy purchase costs in the category represent the costs incurred by the **incumbent retailer** in purchasing electricity from the wholesale electricity market is limited to the current operating model. As the current incumbent retailer has had past market competition in the form of ERM Power supplying contract energy to the ACT Government, the wholesale supply mechanism needs to be evaluated against an alternate electricity supply and retail methodology that will provide a significantly different operating model that includes and facilitates a local generation and transmission model that will decrease costs of retailing electricity in the ACT.

An alternative methodology needs to be adopted to assess a wholesale purchase price of the ACT electricity. A cost benefit analysis of the existing model compared to the adoption of a LCN (locally facilitated ACT generation and transmission network model) that includes options such as the generation and transmission of ACT electricity being brought within the boundaries of the ACT. A comparative evaluation would show immediately that a 40% reduction in CO<sub>2</sub> would be achievable by the introduction of a CCGT generator to replace the coal generated supply brought in from NSW TransGrid generation. This would immediately assist in reducing the amount of carbon offsets required for the ACT to meet its CO<sub>2</sub> reduction targets and the current 100% renewable electricity goal would be enhanced by 40%.

**Graph 1: Emissions-intensity of generation technologies**

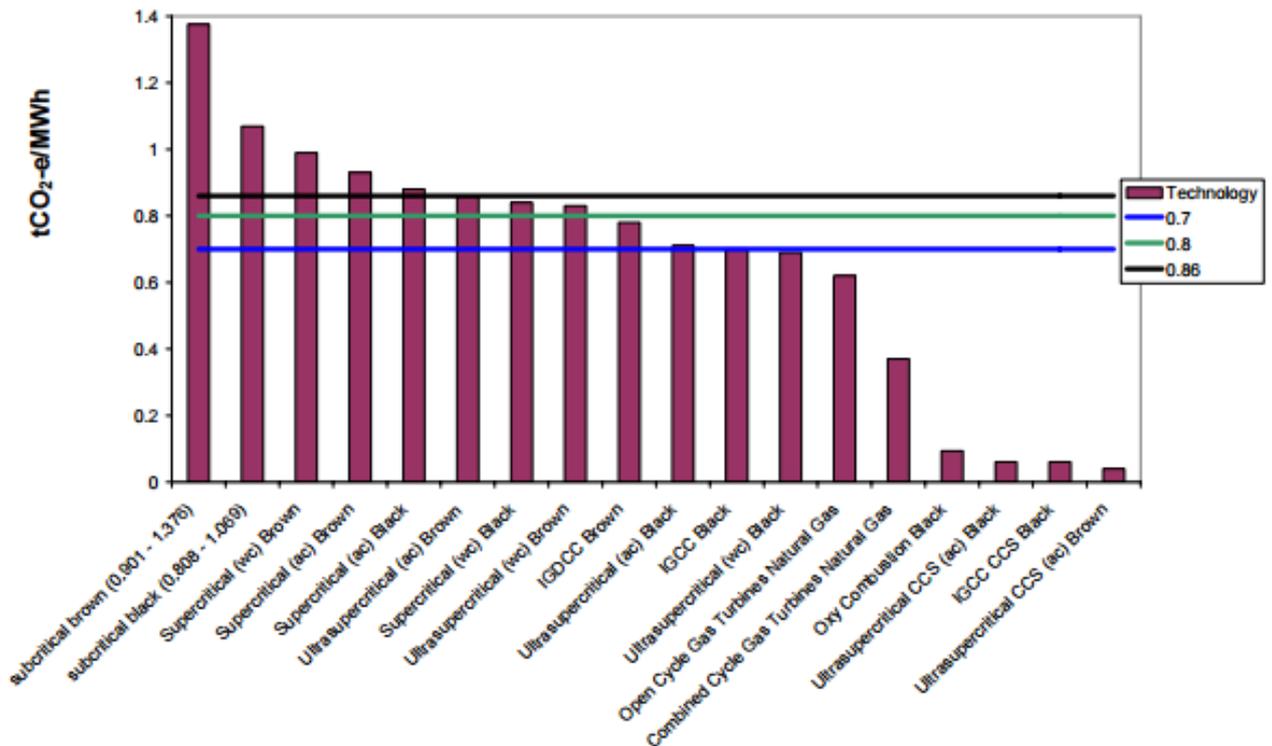


Figure 1: Source Department of Resources Energy and Tourism, Australian Government 2010, discussion paper: A Cleaner Future for Power Stations

The economical options as expressed by AGL CEO Andrew Vesey have put Ultra supercritical coal and Carbon Capture and Storage (CCS) in the same boat as nuclear power generation as financially unviable options to utilise for pathways to meet emission reduction targets.

The CCGT generation offers the lowest emissions intensity but issues associated with cost of gas supply and emissions from gas generation and fugitive emissions need to be considered in detail and appropriate measures taken to remediate these issues.

The fossil fuel scale down and sunset provisions and timing will need to be factored in to meet 2030 and 2050 reduction targets. It needs to be acknowledged that some gas will in all probability unless alternative or substitute materials are conceived, still need to be supplied for ongoing production of goods such as plastics, medical and feedstock for fertilisers etc past 2050.

## Estimated Operating Emissions for New Power Stations<sup>72</sup>

Generation type	Estimated operating emissions as generated <sup>73</sup> (kg CO <sub>2</sub> -e/ MWh)
Subcritical brown coal	1,140
Supercritical brown coal	960
Subcritical black coal	940
Supercritical black coal	860
Ultra-supercritical brown coal	845
Ultra-supercritical black coal	700
Open cycle gas turbine (OCGT)	620
Combined cycle gas turbine (CCGT)	370
Wind	0
Hydro	0
Solar PV	0
<b>NEM electricity grid emissions intensity</b>	<b>820<sup>74</sup></b>

Table 1: Source. Finkel preliminary report December 2016 (Independent Review into the Future Security of the National Electricity Market)

A locally operated CCGT will allow for seamless base load supply that can be sustained in the short term and allow flexibility and control of renewable energy additions as required to a point in time when battery storage will hopefully be able to facilitate complete independent frequency control and the network can be serviced eventually by 100% renewable energy when gas can be largely transitioned out of the generation system, possibly within 15 years.

### Fugitive emissions and transition from gas to renewables

Gas issues of fugitive emissions need to be considered and minimised and this should lead to further work with CSIRO who have scientific expertise and monitoring ability. CSIRO have reported that our well heads are low emission compared to many overseas emissions but appropriate scanning and monitoring and ameliorative measures such as capture transfer and resealing will need implementing. This is a priority and the work with methane conversion in particular is essential knowledge as it is another potential global warming tipping point issue often overlooked that may have to be addressed on a global scale very soon if melting ice due to warming releases vast quantities of trapped methane.

Conversion of methane, which has 50 times greater (GHGWP) potency compared to CO<sub>2</sub> is another area of expertise that our researchers are conducting and need to be supported. It needs to be understood that this is a pre-existing issue as we already have over 5,000 well heads in Queensland

and 20% of our gas is presently from Coal Seam Gas (CSG). We have some examples in the ACT with current operations of Landfill Gas (LFG) at the Mugga Lane tip, and numerous CSG and Waste Coal Mine Gas (WCMG) extraction and generation facilities close by which are already feeding electricity into the NEM. Policy and legislation on national fugitive emission monitoring and abatement should be enforced with the major gas producers funding this by contribution to a national sinking fund based on amount of wells and production volume.

Large scale leaks will need quick conversion and that could take the place of hydrogen conversion and or storage such as AGL's Silver Springs/ Renlim reservoir in the Bowen Surat Basin in central Queensland. Gas underground storage should only be utilised with a caveat that it should not be put to use as a pressure balance technique using the pressure to extract further oil or gas.

**CCGT itself offers lower emissions of CO<sub>2</sub> but has the added benefit for transport fuel offsetting in that it has far less nitrous oxides given off in generation compared to coal (92% less) and will be helpful in transition generation. The switch to electric buses, light rail and EV's will require electricity which will be a growing electricity consumption that needs to be factored in now. A tsunami of change is about to hit and we will need to provide fast charge battery opportunities and in turn if we address this now we will be in a much better position to reduce the 23% transport emissions of the ACT.**

Other opportunities in utilising LNG locally and developing local knowledge and expertise include converting diesel engines in road trains and in international shipping which are major CO<sub>2</sub> contributors to gas. Tankers and cargo ship engines can work just as well with LNG which doesn't contain sulphur and therefore has SO<sub>2</sub> emissions close to zero. Gas engines also dramatically reduce other PM emissions.

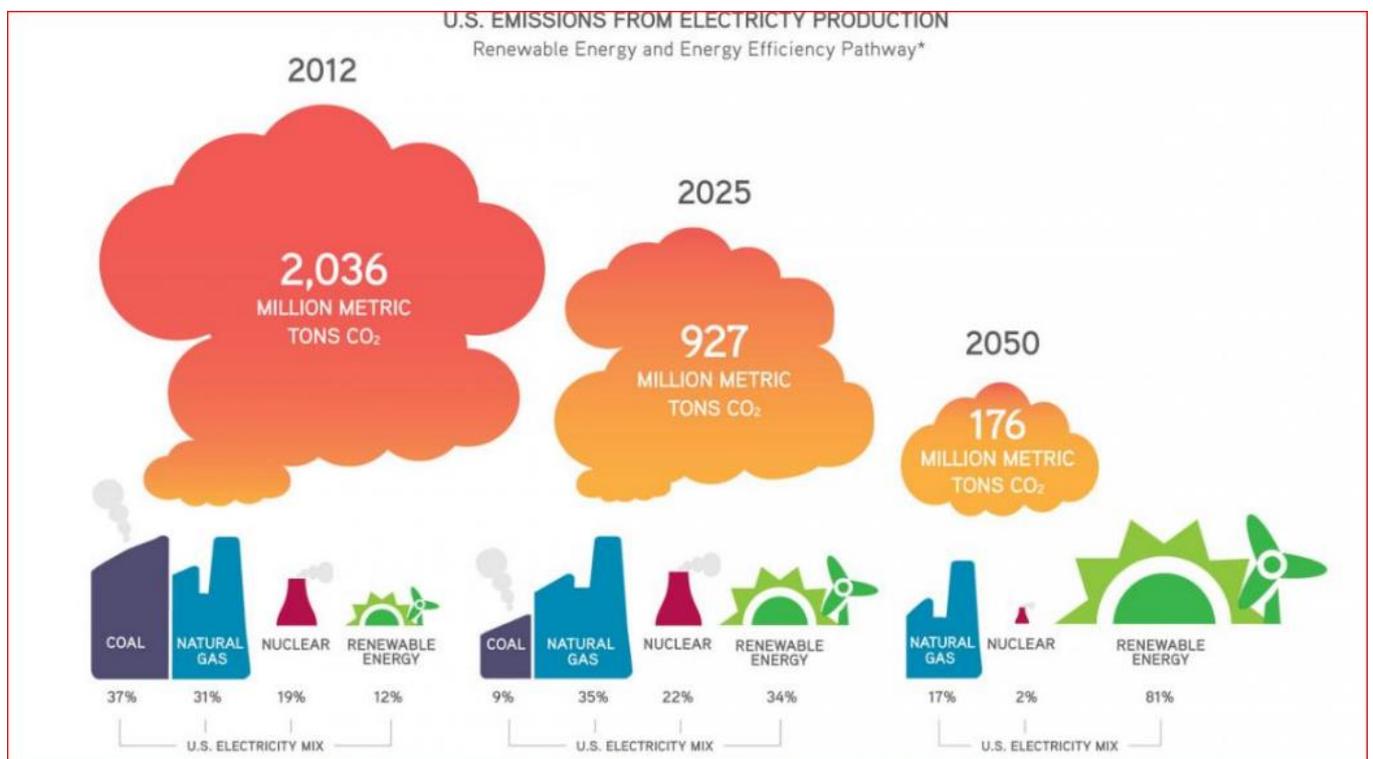


Figure: 2 US pathway to 2050 and emission reductions. Source Union of Concerned Scientists

\*Based on UCS-led analysis using the National Renewable Energy Laboratory's Regional Energy Deployment System (ReEDS) model.

There is a belief in some quarters as shown in figure 2 above that it is possible to eliminate coal from the US electricity production. Further economic analysis is required such as cost of production, stranding of existing assets before the end of economic life and the amount of gas still required to maintain the US electrical supply as shown. The pathway to achieve the US 2050 emissions reduction will be dependent on the economics of supply and factors such as fugitive emissions and the advances of battery storage.

There is some varying emission prophecies that need to be explored such as the Infographic of figure 2: from the publication *The Climate Risks of Natural Gas — Fugitive Methane Emissions*, which claims:

**“Fugitive methane emissions are 34 times more potent than carbon dioxide at trapping heat over a 100-year period, and 86 times stronger over 20 years.” Union of Concerned Scientists**

Technologies are available to significantly reduce fugitive methane emissions but will require policy to implement. Aging, leaky pipelines can be upgraded or replaced. Drilling site emissions can be better monitored, and effective use of available technologies can minimize the amount of fugitive methane that escapes.

Stronger state and federal laws and regulations are also needed, for monitoring, evaluating, and mitigating the fugitive methane emissions associated with the production and distribution of natural gas.”

<http://www.ucsusa.org/clean-energy/coal-and-other-fossil-fuels/infographic-natural-gas-fugitive-methane-emissions#.WPxiYfI97IU>

A major US<sup>1</sup> study from the National Oceanic and Atmospheric Administration's, Cooperative Institute for Research in Environmental Sciences at the University of Colorado, Boulder found that substituting natural gas for coal has sharply reduced air pollutants from power generation in the United States.

The researchers compared readings from stacks across the country since 1997, then calculated emissions per unit of energy produced.

CCGT plants were the most efficient producing half the CO<sub>2</sub>, for every kilowatt-hour produced, according to the study and a fraction of the pollution with nitrogen oxide and sulphur dioxide emissions between coal- and gas-fired plants.

Gas-fired plants emitted only 7% of the nitrogen oxides and 0.2 percent of the sulphur dioxide of coal burning generators, the study found, largely because nitrogen oxides can be more efficiently controlled in a gas plant and sulphur content is very low in natural gas.

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<sup>1</sup> de Gouw, J. A., Parrish, D. D., Frost, G. J. and Trainer, M. (2014), Reduced emissions of CO<sub>2</sub>, NO<sub>x</sub>, and SO<sub>2</sub> from U.S. power plants owing to switch from coal to natural gas with combined cycle technology. *Earth's Future*, 2: 75–82. doi:10.1002/2013EF000196

In a further 2016 study<sup>2</sup> by Littlefield et al, the results summarised were: “Our calculated CH<sub>4</sub> emission rate for extraction through pipeline transmission is 1.2% for current practices. Our model allows us to identify GHG contributors in the upstream supply chain, but also allows us to tie upstream findings to complete life cycle scenarios. If applied to the life cycles of power systems and assessed in terms of cumulative radiative forcing, the upstream CH<sub>4</sub> emission rate can be as high as 3.2% before the GHG impacts from natural gas power exceed those from coal power at any point during a 100-year time frame.”

The results of the Littlefield study were that CH<sub>4</sub> emission rates for all natural gas sources in their model ranged from 0.60% to 1.6%. The natural gas power plant used in the analysis was a state-of-the-art combined-cycle natural gas power plant used for baseload electricity generation with a net efficiency of 50.2% and emission rate of 365 g CO<sub>2</sub> per kilowatt-hour (kWh) of electricity generated (NETL 2010). In the Littlefield model, the CH<sub>4</sub> emission rate can be interpreted as 0.43% if based on a narrow boundary (extraction only) and 1.7% if expanded to a wider boundary (cradle-to-distribution). The findings concluded:

“Using 100-year GWPs, if natural gas emissions are lower than 11.9%, new natural gas power is preferable to new coal power; when using 20-year GWPs, this breakeven is reduced to 4.5%. If TWP is used instead of GWP, new natural gas power will have a lower climate impact than new coal power over its entire operating life if the CH<sub>4</sub> emission rate is lower than 3.3%, and over longer periods will always result in lower cumulative forcing.”

This analysis was prepared by the Energy Sector Planning and Analysis (ESPA) team for the United States Department of Energy (DOE), National Energy Technology Laboratory (NETL). Emissions from gas produced in Australia have been reported at 0.5% of gas production and if trebled would still be acceptably lower than coal. However, a comprehensive analysis of CSG fracking sites in the Bowen Basin would be a good baseline to assess the concerns of high emissions related to unconventional CSG.

### **A global moratorium on the abandonment of fossil fuels and rules to transition to renewables.**

An economical alternative is now possible with a transition to gas and renewables. Issues such as Adani and Indian energy can be addressed by offering alternatives such as LNG and hydrogen. (Please do not mine our coal we have an alternative.)

It is better that we transition out of all fossil fuels ASAP but at the same time a preparedness to burn methane- natural gas will be required and addressing this need by global rules that signal down grading of high emission production sites to those operating with less potent GHG emissions needs to be considered as urgent ameliorative measures. Thus support for an ETS based on intensity.

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<sup>2</sup> Littlefield, J. A., Marriott, J., Schivley, G. A., Cooney, G. and Skone, T. J. (2016), Using Common Boundaries to Assess Methane Emissions: A Life Cycle Evaluation of Natural Gas and Coal Power Systems. *Journal of Industrial Ecology*, 20: 1360–1369. doi:10.1111/jiec.12394

Again the ACT as a centre of policy development can contribute to a progressive international policy setting of global abatement. The stranding of coal assets is happening at the moment by market forces but this needs to accelerate to sufficiently reduce GHG emissions.

### **Economic modelling with a low carbon network for the ACT**

In the short term the economics achieved by introducing an LCN in the ACT is relatively easy to quantify. By reducing the TNSP transmission charges and energy saved by less energy loss with more efficient local generation, transmission and distribution efficiencies achievable compared to the present TransGrid long dispatch and transmission supply need to be factored into economic modelling and costing. Short and medium term cost benefits also are considerations such as increased stability and control of a network that will be much more efficient in enabling micro grids to interact and larger industry growth and security.

A low carbon network will allow an ability to control the retail electricity death spiral that present retail models assign to the rise of household solar PV (and soon to be businesses switching to solar PV). Now with the added benefit of battery storage technology there is more pressure on already stranding inefficient generation assets. **As consumers switch to solar – grid consumption drops and retail prices rise as consumption drops - Networks answers have been to increase the supply charge to maintain profit. This is a failed model and needs to change to a different supply and revenue base. The ACT Government must now realise the disruption is here and change tack to a new model which will accommodate the new conditions by developing the LCN.**

### **A fundamental restructure to cater for disruption.**

A low carbon generation, transmission and distribution network is required to allow for renewable generation expansion. The network is to be serviced by the ACT Government providing a LCN capable of transitioning technically into a growing renewable and tertiary hub in alignment with the ACT Governments commitment to meeting its Under 2 MOU. There are opportunities to make the network a unique small scale world leader but it needs to be agile, act immediately, have a generation ability that supports the rhetoric of being the renewable energy capital by facilitating an immediate transition.

Currently only 100 MWh are generated by solar farms and a small scale gas plant in the ACT. The opportunity for the ACT to generate and transmit electricity locally needs to be grasped and our network capable of being flexible and controlled locally to meet the challenge as a wave of investment into disruptive technologies which is about to hit the Australian economy. The ACT should be primed to accept and lead this opportunity.

By the ACT adopting its own low carbon network it will enable employment and growth in disruptive technologies to take place with a network designed to be flexible and intelligent to respond to change and meet the challenges, nationally and internationally. With unique generating capacity new technology will be seeking to relocate to the ACT by virtue that a co-operative LCN can cater to new energy saving opportunities such as low draw data centres. Application of synchronous condensers to the ACT grid to cater for intermittent supply by inertia change and the ability to absorb reactive power could be reconfigured from decommissioned synchronous motors from inefficient and stranded generation assets available from closed power plants. Frequency control studies and implementation can be carried out as earnest research utilising the LCN.

Canberra is already home to locally developed Network Optimisation companies and in the initial stages of creating a market. The adoption of policy that allows Rate of Change of Frequency Control (RoCoFC) standards can be implemented. The development of a digital network optimisation market allows the controlled flow of Distributed Energy Resources (DER) to be facilitated into the grid on a commercial basis that are now offering economic benefits.

### Increased revenue

Further to assessing rising electricity costs that have occurred after the privatisation of state owned electricity assets. It is very straight forward to see what has happened via ABS data - that electricity prices increased by 40% while profits rose 67%.

The change of ownership from state owned asset has been shown that it can create a burden to taxpayers and at the same time denies a revenue stream for government. The Queensland treasury reviewed Powerlink, as an asset which has delivered no losses and high profits over 15 years. Its RAB, during that timeframe has multiplied by a factor of four.

The Queensland Government's \$401 million equity investment in Powerlink has accrued total returns of \$9.4 billion, that is, it has returned over 23 times the equity investment.

Learning from models that are working such as Norway's Statoil, Singapore's SP Power (Ministry of Finance, Singapore Government controlled) and the Chinese StateGrid's global scaled state partnership model. Jemena itself is a StateGrid subsidiary which presently owns 50% of the ActewAGL Network. StateGrid has a 15 year plan to secure external energy sources outside of China for revenue and energy security.

The ACT Government should likewise look at a similar model of retaining and growing its energy asset and is well placed to do so. Electricity production with renewables allows the opportunities for the ACT to enter into the manufacturing of batteries and electrical motors. If the ACT has grid control it will have the capability to cater for energy intense industries especially if the ACT LCN has links to other states as a part of a co-operative that need electricity for aluminium production.

While Norway came up with the idea of the state owning shares in private companies and building sovereign wealth these opportunities can be replicated here in Australia with our own bountiful natural resources and energy supplies.

### Reduced carbon

The ACT has opportunities to reduce its 23% GHG emissions component in transport, by the adoption of electric vehicles aided by light rail and an electric bus fleet. The adoption of lower priced electricity from renewable electricity and the economics of autonomous vehicles will very soon (within 5 years) be a reality and all will be better served by having an integrated generation and transmission model.

**Figure ES.3 ASX futures market data for wholesale electricity 1 July 2015 to 28 February 2017**



Source: Commission's calculations based on ASX data

Figure 3: ASX Futures market (Figure ES3 of the ICRC draft report)

The doubling of electricity prices between February 2016 and 2017 as shown in the ASX Futures Market gives rise to need for increased awareness of the value of these assets and security of supply and risk mitigation which again can be facilitated by the ACT creating its own generation of energy. Security of supply of gas can be achieved by several options such as by short to medium supply contracts with existing sources or new participants entering the market place especially if encouraged by joining a co-operative Low Carbon Network (LCN).

### Ethical investment instruments

Inter-governmental partnerships especially with South Australia and Victoria could be explored for a new low carbon network with associated gas pipeline with gas feeds from appropriate transparent gas producers and suppliers.

The lack of transparency and cabal approach developed by the major oil and gas producers who are operating as a cartel gaming the export market at the expense of domestic supply is staggering in its enormity and the impact on our economy and must be addressed.

This is an excellent time to redress these issues at a state government level, similar to what has recently occurred with the South Australian Governments rapid development of "Our energy plan" released in March 2017. Third party ethical investors that are preferably listed on the ASX or have agreed to incorporate a defined set of CSR principles will be able to assist and provide finance and PPP investment into a government backed LCN. Financial assistance may include similar measures as those utilised so heavily by the AER upgrade network cost recovery model of discounting capital outlay and being able to claim back 8.8% of upgrade costs while accessing low interest rates as per the AER capital network upgrade (gold plating) allowances that have been estimated to have cost

over \$40 billion over the past decade and then with upgraded assets were sold off to foreign Governments who understand return of investment and energy security.

Foreign entities that are making billions in profit from extracting Australia's natural resources are avoiding paying any tax at all in Australia, while at the same time controlling the export markets flagrantly using arbitrage trading via tax havens such as Singapore where tax minimisation and value added arbitrage for Australian energy stock takes place. \$500 billion per annum in international related party dealings (IRPD) estimated and reported by the ATO. In 2012 Singapore with a tax rate of 15% accounted for around 33 per cent of total IRPD expenditure which was \$272 billion.

Tax minimisation schemes abused by over gearing assets and write downs need to be regulated. In 2013, two energy infrastructure businesses with the same foreign ownership were sued by the ATO for unpaid taxes, interest and penalties of \$860 million for taxes owed between 2000 and 2009. A federal judge ruled in favour of the ATO after the companies failed to lodge any documents in the case.

In June 2014, the Adelaide Advertiser reported that SA Power Networks made after-tax profits of \$420 a year from each customer compared with \$92 for another business owned by the same utility in Britain. SA Energy Minister Tom Koutsantonis stated, "I will be writing to the federal regulator and to the Prime Minister Tony Abbott to say that it is unacceptable for a regulated company like SA Power Networks to make super-profits from its customers."

Similarly the same foreign backed company Cheung Kong Infrastructure (CKI) that has moved its operations from Singapore to Cayman Is, on the 20<sup>th</sup> of April 2017 was granted FIRB approval to acquire the Duet Groups (ASX listed) assets, which included the West Coast gas pipeline, a WA (monopoly) pipeline from the North West Shelf to Perth.

Other Duet assets with a bearing for access to gas supply for the ACT included the large Mornington Peninsula- Yarra Valley gas pipeline. The sale of Duet in April 2017 has now created the situation where the East Coast and West Coast gas pipelines are owned by foreign government backed entities. Previous concerns expressed by the ATO regarding tax minimisation have been clearly articulated to the Federal Government who seemingly is unable or unwilling to prescribe appropriate foreign investment regulations to stop national assets and revenue being removed to tax havens.

In 2012 the then Prime Minister Julia Gillard made the statement in regard to the recommendation released by the Manufacturing Taskforce to create a Sovereign wealth fund and gas reservation policy with the impending \$200 Billion LNG developments: "However, the government does not support recommendations in the report to further investigate a sovereign wealth fund and a domestic reservation policy for gas." This position now needs to be reversed.

The issues of tax avoidance and excess profiteering need to be rectified by the Federal Government who continue to allow foreign Government sponsored and backed businesses or foreign multinationals that operate with a finance model that not only minimises tax revenue returns to our governments but punish the consumer with exorbitant profits being extracted.

These entities continue to operate without being adequately regulated. Simply the Government needs to legislate and regulate (especially those seeking to privatise Government assets and assets

of national importance). The Foreign Investment Review Board (FIRB) needs to operate in our national best interest and tighten the tax minimisation scope. Straight forward requirements such as when a foreign company acquires a substantial Australian asset the acquiring company must have a valid CSR policy in place, not have record of tax evasion including previous fines, operate as a reporting entity on the ASX and not have a financial tax haven structure with associated stapled securities and trusts. These basic requirements need to be in place before any other national resource acquisitions take place.

These requirements are mandatory in most other countries especially regarding natural resources. Issues such, as prioritising country of origin gas pricing over exports with the creation of a domestic gas reservation policy are in place in Canada and the US. The ACT needs to work with other States to develop a co-operative energy approach. The East coast gas exporting States need to declare a 15% domestic reservation policy as Western Australia has already implemented. The Federal Government needs to be lobbied to legislate to having domestic gas priced at the lowest current export contract price.

Sustainable procurement and licence regulations can be included in the ACT's LCN co-operative membership requirements.

## Conclusion

The ACT Government has an ability to change its electricity cost model by incorporating electricity generation, transmission, distribution, cost and carbon abatement by the adoption of an LCN. The basic composition of the ICRC report will change in relation to the additional components of generation and transmission now having to be calculated. However, applying the underlying savings to the present ICRC report format should be virtually interchangeable when estimates of the proposed CCGT generation cost are incorporated into the present ActewAGL network and ActewAGL retail model. The underlying reduction in carbon and cost to the client should be straight forward to calculate and the ICRC may consider consultations and discussions with colleagues in South Australia who have recently undergone similar dimensional changes to their electricity supply and distribution model. The ACT model proposed has the added advantage of being able to operate as a retailer.

Undoubtedly, there is a need to address the present ACT electricity provisions as summarised to meet the ACT Government's stated Under 2 MOU requirements as there is with the South Australian Government's need to meet the same MOU undertakings. The economic and social valuation to assess a new LCN for the ACT falls into the terms of reference of the ICRC as below, in particular the sections underlined.

The Commission must consider:

**a.** The direct impact on electricity costs of government policies and pass through of costs and savings to regulated prices including, but not restricted to: **i.** the ACT retailer obligations under the Energy Efficiency Improvement Scheme; **ii.** the Commonwealth Government's Large-scale Renewable Energy Target and Small-scale Renewable Energy Scheme; and **iii.** **any other schemes implemented to address climate change relevant to electricity pricing.** **b.** **The efficient and prudent cost of managing risk in the cost of purchasing electricity for the period of the price direction.**

I am requesting that ICRC analyse and adopt an alternative electricity pricing model for the ACT that takes up a new role within the ACT energy supply as a generator and transmitter of grid scale baseload generated electricity that will service the ACT and the SE region of NSW. This may hopefully translate into an interstate LCN and transform the Australian economy into a low carbon leader.

The establishment of a 500 MW CCGT at Williamsdale gives an immediate second genuine 300kV bulk point to the ACT. The present arrangement and the proposed transmission and switching asset to feed Williamsdale from the single Yass supply point still contains a single point of 330kV vulnerability. This will be resolved with a genuine second feed is made available from Williamsdale.

As an exporter to the NEM from Williamsdale it allows for a new LCN service (currently ActewAGL Retail operate in these areas) to Bega, Cooma, Yass, Queanbeyan and Goulburn as per the introduction of the proposed 2012 preferred distribution option which enables 3 x 300kV bulk supply points for Canberra's energy security as per figure 3 below:

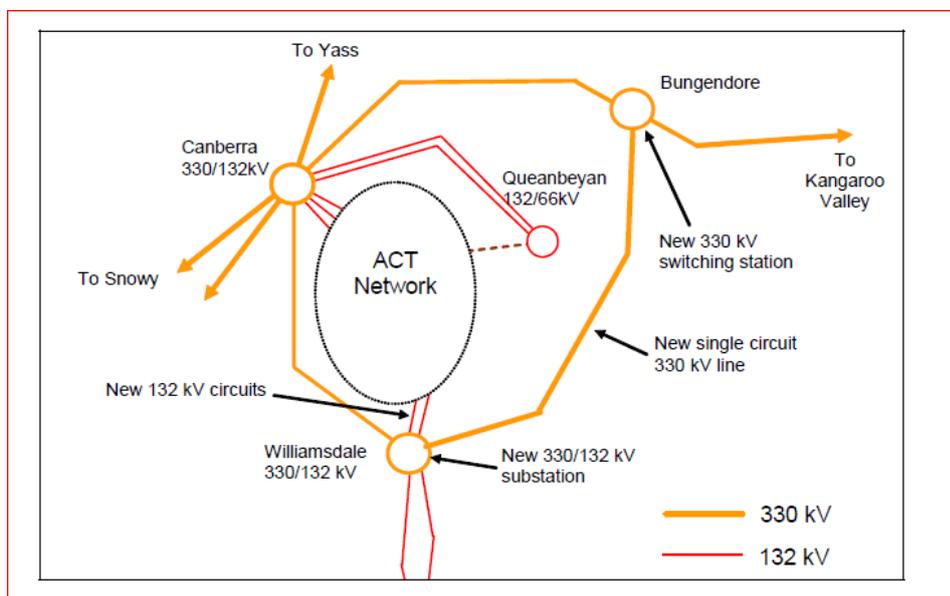


Figure 3. 500 MW CCGT Generator supply point at Williamsdale

The development of local generation and transmission capacity along with existing and modified distribution will allow the ACT network to be a smart network that will expedite the roll out of renewable energy. Most definitely this will address climate change relevant to electricity pricing by immediately taking 40% of carbon out of the ACT supply, mitigate the cost of managing risk and create greater energy security. By the ACT being a generator with low transmission costs to connect to the NEM at three strategic points it creates a low cost genuine second bulk supply point and the development of a LCN network model that can service the SE region. The ability to obtain revenue by a co-operative partnership will also allow for sales into the NEM with trading and micro grid assistance throughout Queanbeyan, Bungendore, Yass, Goulburn, Bega and Cooma

I look forward to constructive pathways being assessed and developed for the genuine benefit of global climate change and the ACT.

Regards

Shane