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Mandalong Southern Extension Project Modification 10 – SSD-5144

Introduction

This submission is in support of the application and I have made no political donations in the past two years.

It is essential that the Mandalong Southern Extension Project Modification 10 is approved. The reason for such a statement is straight forward, NSW needs Mandalong's coal to generate electricity at Eraring Power Station.

Figure 1 below is a summary, from the Department of Industry, Science, Energy and Resources showing NSW's energy needs in 2019-20.

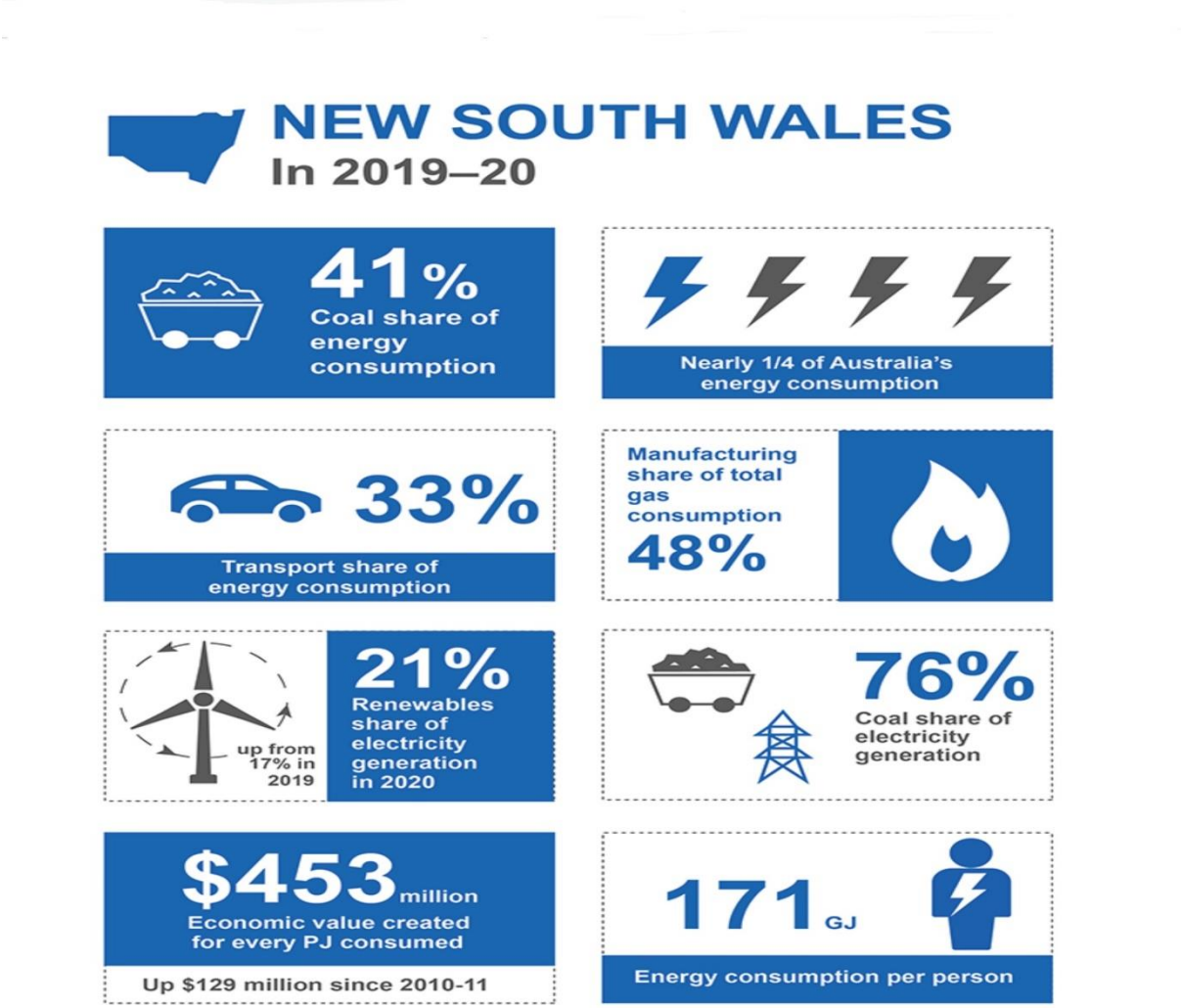


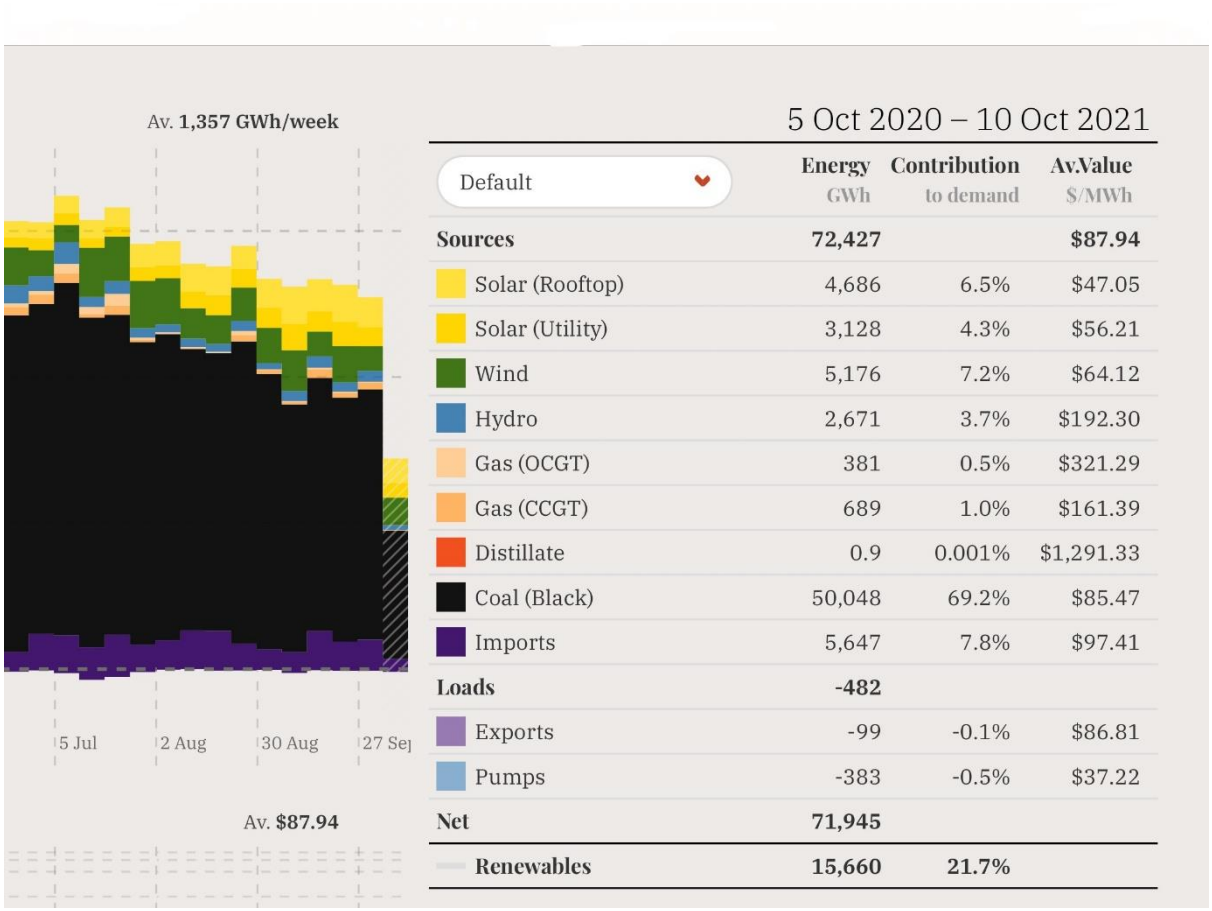
Figure 1 – NSW Energy Summary

It is noted that 76% of our electricity is generated by coal fired power stations. Renewables make up 21% of generation but 7% of this is hydro power so wind & solar account for only 14% of NSW's electrical generation.

It will be many decades before renewables will be a dominant generation source in NSW.

Performance of Renewables

NSW has not been self-sufficient in the generation of electricity since Wallerwang and Munmorah Power Stations closed over 7 years ago as shown in Figure 2 below. In the past 12 months, 77% of NSW electricity was generated from coal while 7.8% of NSW's electricity was imported from Queensland's coal power plants.



5 Oct 2020 – 10 Oct 2021

Default	Energy GWh	Contribution to demand	Av.Value $/MWh
Sources	**72,427**		**$87.94**
Solar (Rooftop)	4,686	6.5%	$47.05
Solar (Utility)	3,128	4.3%	$56.21
Wind	5,176	7.2%	$64.12
Hydro	2,671	3.7%	$192.30
Gas (OCGT)	381	0.5%	$321.29
Gas (CCGT)	689	1.0%	$161.39
Distillate	0.9	0.001%	$1,291.33
Coal (Black)	50,048	69.2%	$85.47
Imports	5,647	7.8%	$97.41
Loads	**-482**		
Exports	-99	-0.1%	$86.81
Pumps	-383	-0.5%	$37.22
Net	**71,945**		
Renewables	**15,660**	**21.7%**	

Figure 2 – NSW Generation From 5 October 2020 to 10 October 2021

It is a well known, but false hope that NSW's electricity generation can come mostly from wind and solar farms in about 10 years time. For the past 20 years NSW (and Australia) has been vigorously building wind & solar farms. According to the federal government's Australian Energy Update 2021 report, these wind & solar farms now produce only 16% of Australia's electricity as shown in Figure 3 below. It will be sometime in the second half of this century before renewables will be a dominant generation source.

Until then NSW will require reliable base load generation which can only come from coal and gas.

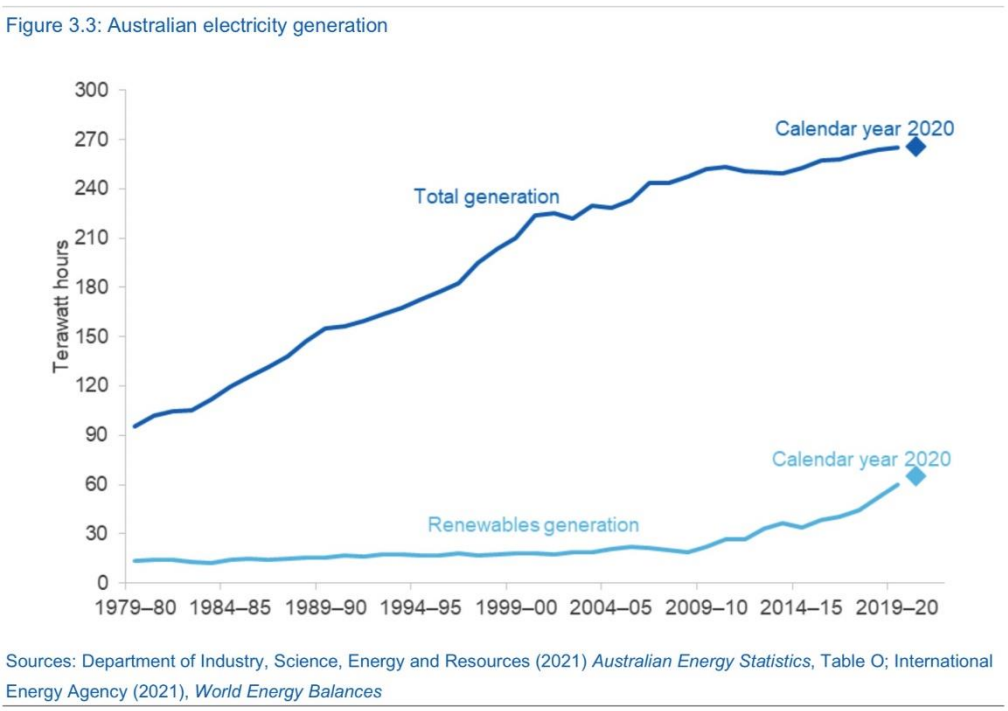


Figure 3 – Renewables Generation v Total Generation

Figure 4 below shows the various generation sources of all energy (for electricity, transport, manufacture & heating) consumed in each state and Australia.

Table 1 below lists the percentage contribution which each source makes to the energy demands of NSW and Australia. Renewables generate only 6% of NSW's total energy requirements.

It is apparent that NSW & Australia require fossil fuels to provide affordable and reliable energy sources for some time to come. We cannot move away from coal – yet. Accordingly, application SSD-5144-Mod 10 needs to be approved.

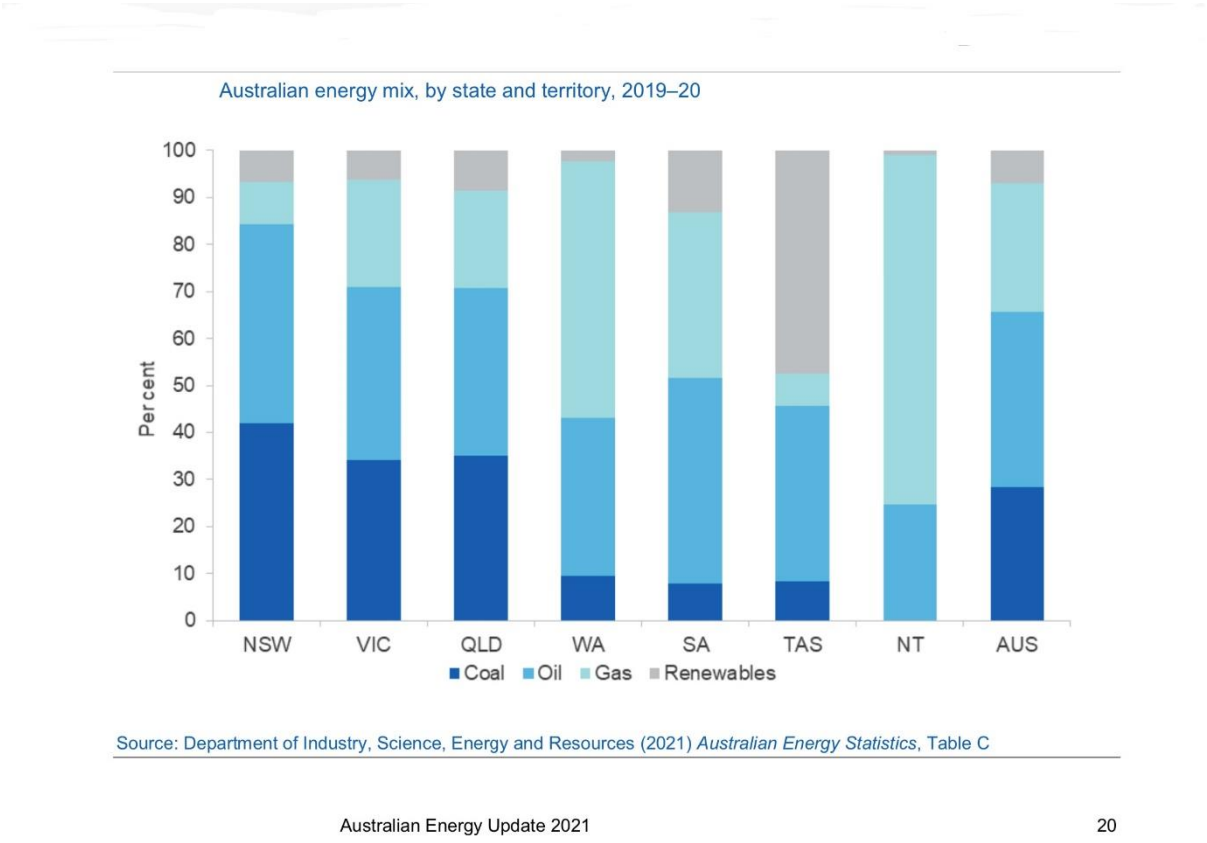


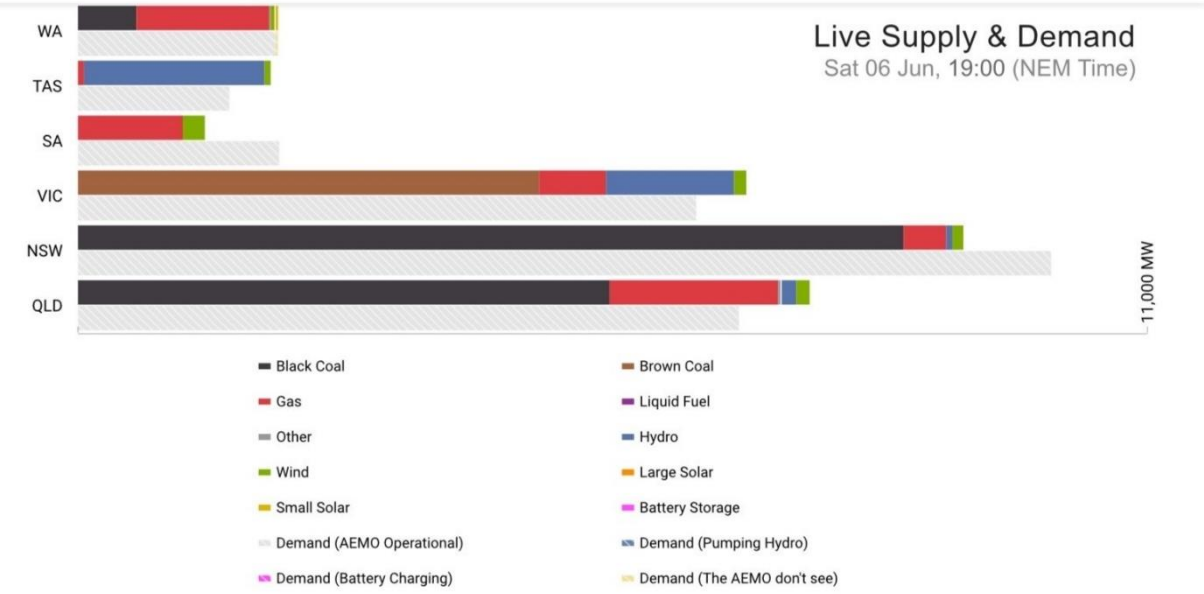
Figure 4 – Total Energy Generation by Source

Generation Source	NSW	Australia
Renewables	6%	6%
Gas	10%	28%
Oil	43%	38%
Coal	41%	28%
Total	100%	100%

Table 1 – Percentages of Total Energy Generation by Source

There are times, on windless nights, when renewables provide as little as 2% of our electricity. Overnight Australia consumes 250,000 Megawatt hours and during these windless nights coal and gas produce over 95% of our electricity.

Figure 5 is taken from a live website at 7pm on a windless night in June when renewables contribution to Australia's electricity supply is nearly non-existent. Table 2 is a statistical summary of the sources of generation at that time.



Generation

Region	Black Coal	Brown Coal	Gas	Liquid Fuel	Other	Hydro	Wind	Large Solar	Small Solar	Battery Storage	Total
Western Australia	600	-	1,373	0	12	-	43	-	28	-	**2,055**
Tasmania	-	-	57	-	0	1,857	66	-	0	-	**1,980**
South Australia	-	-	1,083	0	0	-	224	0	2	0	**1,310**
Victoria	-	4,737	694	-	0	1,313	126	0	0	6	**6,876**
New South Wales	8,495	-	439	0	0	62	110	0	2	-	**9,108**
Queensland	5,470	-	1,730	0	31	153	139	1	2	-	**7,526**
Total	**14,565**	**4,737**	**5,377**	**0**	**43**	**3,385**	**707**	**1**	**34**	**6**	28,855

Figure 5 – Electricity Generation by Source for Each State – Live Website

Generation Source	NSW	Australia
Renewables	1.2%	2.6%
Fossil Fuels	98%	85%

Table 2 – Percentages of Generation Sources on a June evening at 7pm

NSW requires Eraring to keep generating electricity for as long as it can.

NSW Electricity Infrastructure Roadmap

The NSW Electricity Infrastructure Roadmap states that most of our power stations will be closed by 2034 and be replaced mainly by wind & solar farms with some firming generation. Figure 6 below shows that over the past 25 years the growth of wind & solar generation has not made a significant contribution to generation with now only 16% of our electricity being generated from wind and solar.

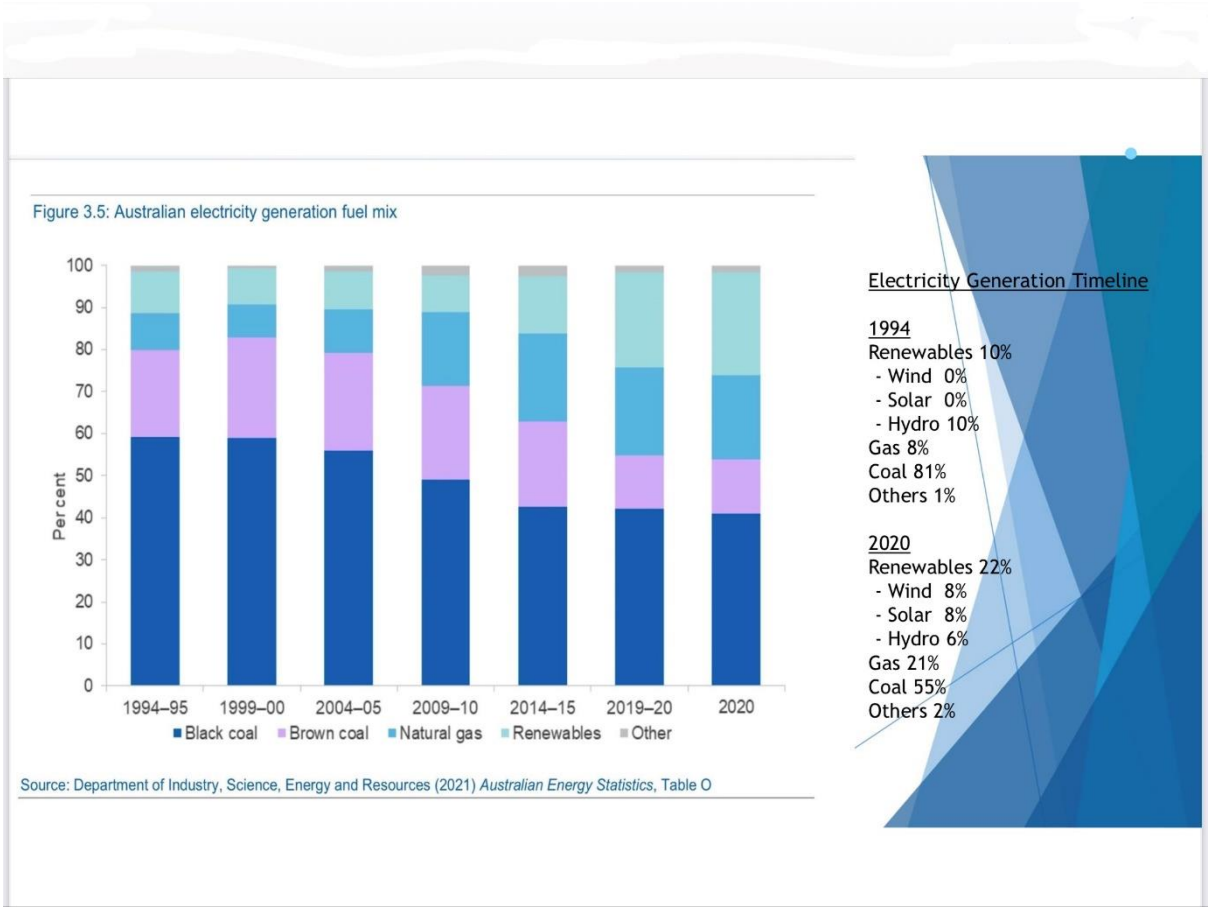


Figure 6 – Showing Growth of Wind & Solar from 0% to 16% in 25 years

By 2034, it is not possible for wind and solar to become the dominant generating sources and provide 70% to 80% of our electricity. NSW requires Eraring to keep generating electricity for as long as it can.

Electricity Generation in Asia

Attachment 7 depicts the location of the 600 or so coal power plants which are under construction or in the planning stage in Asia with a total capacity of nearly 500,000 Megawatts. NSW power plants current capacity is 9,920 Megawatts. Asia acknowledges that in order to achieve a high standard of living it must have 24/7 baseload power.

For NSW to maintain its high standard of living with excellent education and health facilities and high levels of employment it needs to have 24/7 power. Unfortunately solar and wind cannot provide 24/7 power and their technical term is 'intermittent generation sources' because the wind doesn't always blow and the sun doesn't also shine.

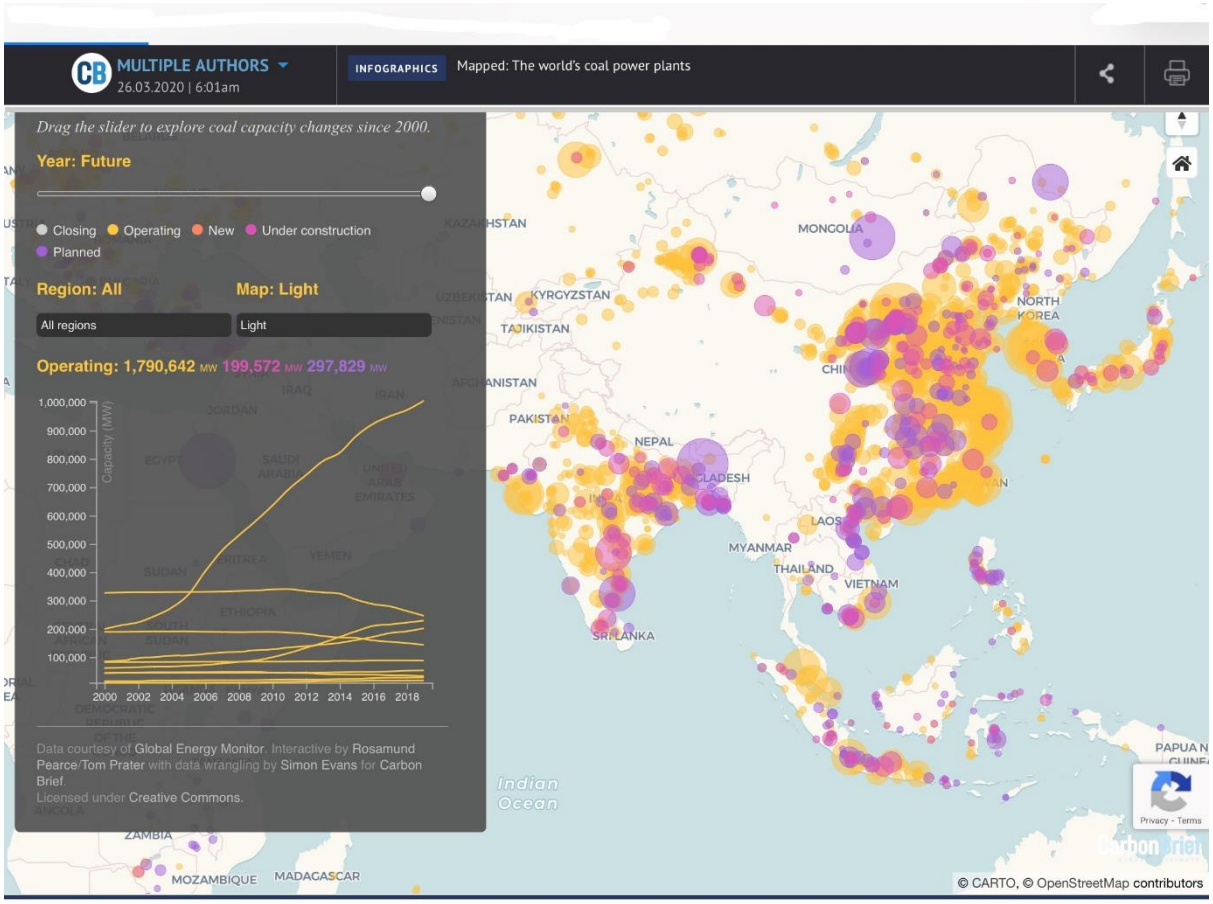


Figure 7 – Showing the Location of the 600 Coal Fired Power Plants being Planned To Be Built or Being Built in Asia

Carbon Dioxide Emissions Are Not All Bad

It is acknowledged that carbon dioxide emissions make a contribution to global warming. However carbon dioxide is a very essential gas for life on earth. If carbon dioxide was removed from our atmosphere life would cease to exist on our planet. Carbon dioxide is required for plants to grow & flourish. CSIRO has carried out research which indicates that plant life on Earth has increased over the past 30 years as shown in Figure 8 due to the increase of carbon dioxide in the atmosphere.

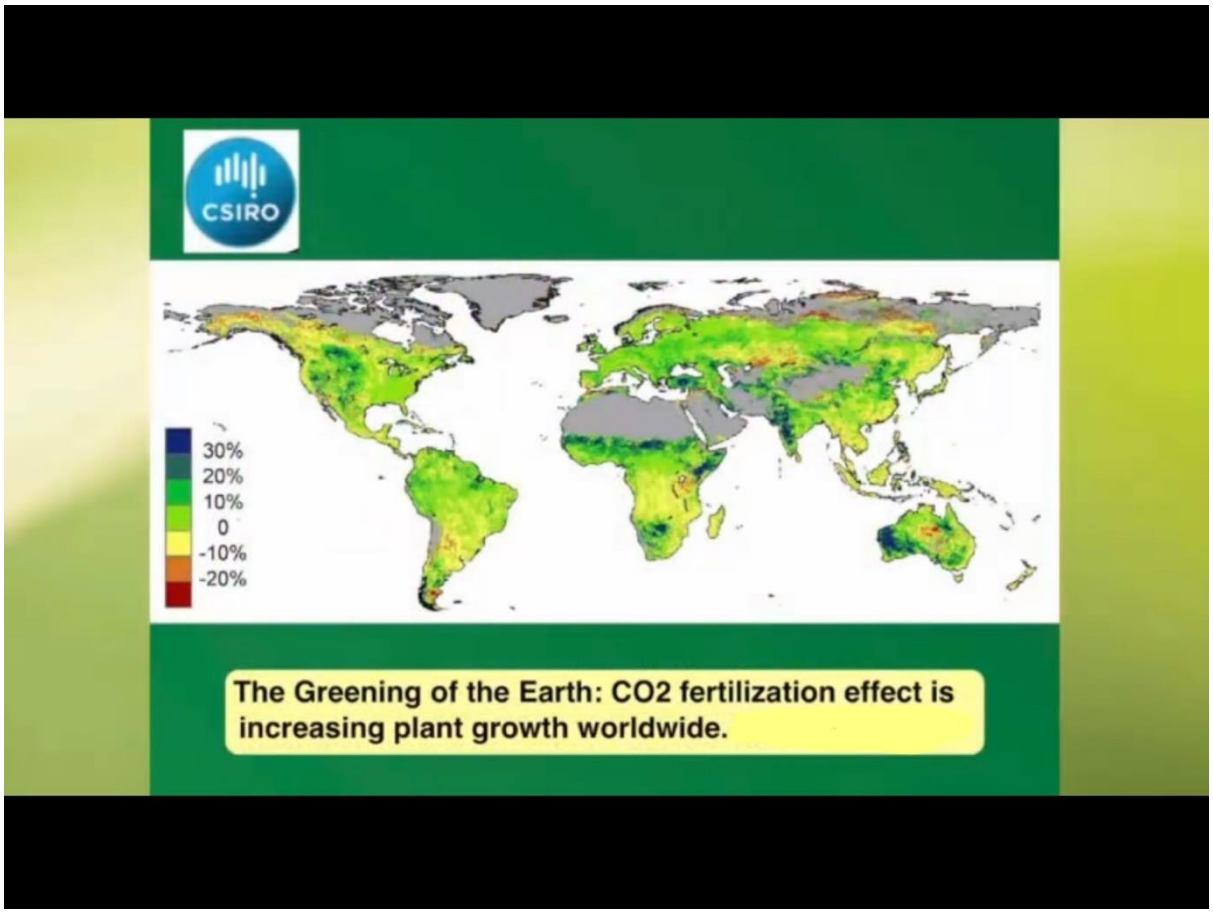


Figure 8 – Showing Results of CSIRO's Research on Global Increase in Plant Life over the past 30 Years

Global Warming/Change

Figure 9 below shows the increase in Australia's annual medium temperature over the last century. The notation below the graph states that 'the recent warming can only be explained by human-caused emissions'. What caused the warming which is not recent, let's say in the first half of the 20th century? We need to consider the role of the Sun which has dominated the Earth's climate for millions of years.

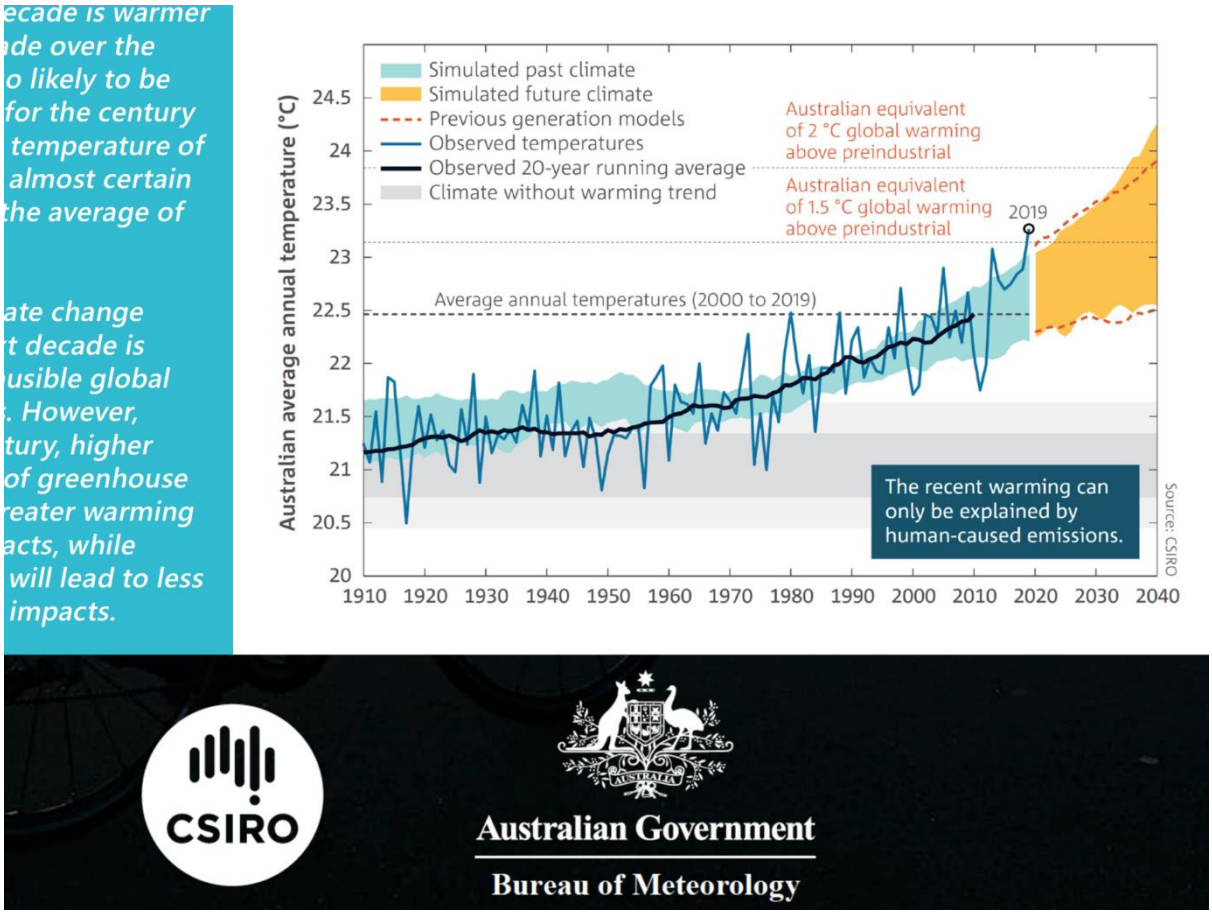


Figure 9 – CSIRO's Graph of Australia's Temperature Rise Since 1910

Figure10 shows the activity of the Sun's solar flares and sunspots between 1000AD and 2000AD. It is worth noting that the low level of sun activity between 1650 and 1750 (known as the Little Ice Age) led to weather records in London showing that the Thames River regularly froze over in winter. The Baltic Sea and many other rivers in Europe also froze during these winters.

The Sun's activity started increasing in 1900 and Australia's temperature started increasing at the same time as shown in Figure 9. At present the Sun's activity is at its highest in over 1000 years. It is not inconceivable that some if not most of the Earth's warming is a result of the Sun's increased activity and that carbon dioxide emissions only make a small contribution to global warming.

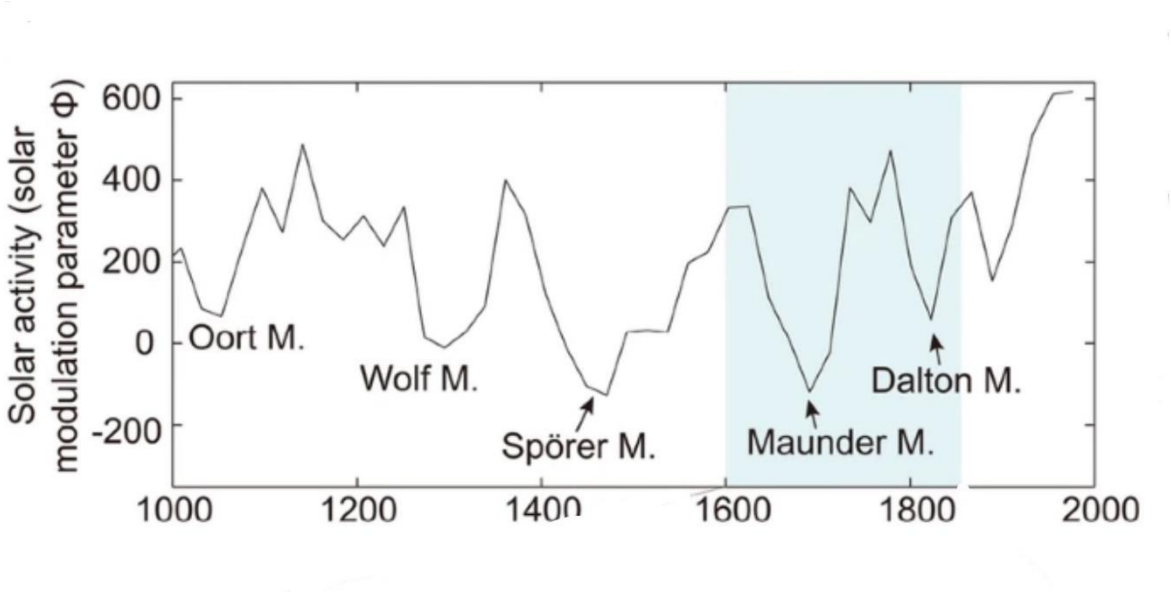


Figure 10 – Graph of the Sun's Activity over the last 1000 years

Conclusion

An objective of the NSW Electricity Infrastructure Investment Act 2020 is:-

- to improve the affordability, reliability, security and sustainability of NSW's electricity supply.

This objective is an imperative for NSW's economic and social well-being. As a modern sophisticated society NSW must have a 24/7 power supply. For the foreseeable future renewables can only provide a small percentage of the generation of our electricity while coal fired power stations (who currently provide 76% of our power) will be required for at least the next several decades.

Under the Environmental Planning & Assessment Act, one of the matters of consideration in evaluating a State Significant Development application is the public interest. It is contended that the ongoing provision of reliable and affordable electricity supply to NSW is a very significant public interest matter.

It is an imperative that the Mandalong Mine Southern Extension Project is approved.