

Submission to the Proposed Changes to the VEET Regulations 2018

Dear Sir/Madam,

I would like to make the following general comments on the proposed VEET Regulations.

I am concerned that the proposed regulation intends to support replacing wood heating with natural gas or LPG, Scenario 9A(iii) and 10A(iii). This approach is completely at odds with other countries such as the UK and the EU that supports the installation of biomass(wood) fueled heating. Wood is recognized as a renewable energy source by the IPCC and its use should be encouraged. If wood waste diverted from landfill is used as fuel then the reduction of greenhouse gas emissions is much greater. Victorian has a significant biomass and waste resource that could be used to replace fossil fuels and the installation of bioenergy systems should be supported.

The regulations generally support the installation of efficient gas and electric heat pump systems which will reduce emissions but wouldn't it be better to support technology that has no emissions. Biomass (including waste) combined heat and power systems connected to district heating systems are common place in Europe and would be economically viable here. Supporting the use of natural gas ignores the fact that Victoria only has a few years' worth of reserves left and although we can obtain gas from other states it's likely to cost more.

Victoria has a target of zero net greenhouse gas emissions by 2050. To achieve that goal the state will need to install significantly more renewable energy production than currently envisaged. According to the Australian Office of the Economist, Victorians consumed around 996.8 PJ of energy annually (2014/15 figures). Of this figure around 30 PJ comes from renewable sources, mainly from bioenergy (wood and wood wastes -18.1 PJ, biofuels and biogas – 9.0 PJ). Electricity consumption was 180.1 PJ, natural gas 280.4 PJ and petroleum products (mainly transport fuel) was 506.3 PJ.

This equates to an average energy consumption of 31,587 MW. The current 40% renewable energy target is equal to 2,282 MW (electricity only). Clearly this is grossly inadequate and the shift to reverse cycle heating and electric vehicles will only increase the states' electricity demand. The VEET regulations should support a shift from existing energy sources to a more diverse mix of renewable energy technologies rather than the current push for wind and solar electricity. Bioenergy is a largely unexploited energy resource that would help meet this increasing demand and at a lower cost.

The emphasis on wind and solar is largely driven by their perceived lower capital cost but when you overcome the capacity factor and variability issues of these technologies the ultimate cost is significantly higher than bioenergy. This is illustrated in the table below.

Technology	Rooftop Solar PV	Onshore Wind	Biomass CHP including heating network
Approximate installed Capital Cost per MWe	\$1,500,000	\$2,000,000	\$15,000,000
Average Capacity Factor	16%	32%	96%
Annual Electricity Output - MWh	1,403	2,805	8,415
Installed MW required to produce 8,415 MWh/p.a.	6	3	1

Capital cost to produce 8,415 MWh/p.a.	\$9,000,000	\$6,000,000	\$15,000,000
Storage required to overcome output variability (see notes)	300 MWh	72 MWh	0 MWh
Cost of Storage @ \$500,000/MWh	\$150,000,000	\$36,000,000	\$0
Total Capital Cost per MWe	\$159,000,000	\$42,000,000	\$15,000,000
Heat Output per MWe	0	0	2 MWh
Additional MWe required to produce 2 MWh of heat	3 MW	1.5 MW	0 MW
Cost of additional output	\$79,500,000	\$21,000,000	\$0
Total capital cost for electricity and heat	\$238,500,000	\$63,000,000	\$15,000,000
Annual Income @ \$110/MWh electricity & \$50/MWh heat	\$1,388,530	\$1,388,530	\$1,767,150
Annual Capital Cost- 4% over 20 years	17,601,300	\$4,649,400	\$1,107,000
Annual Fuel Cost @ \$100/tonne	\$0	\$0	\$360,000
O & M Cost	\$305,000	\$205,000	\$300,000
Annual Profit/Loss	- \$16,517,770	- \$3,465,870	\$150

Notes: Capacity factor is annual system output divided by 8,766 (hours in a year) x 100. Storage capacity required for solar is 300 hours. This is required to overcome the large seasonal variation between summer and winter outputs. Victoria has periods of little or no wind that last 1 to 5 days when large high pressure systems stall over SE Australia. At least 72 hours of storage would be needed to overcome these periods of low wind.

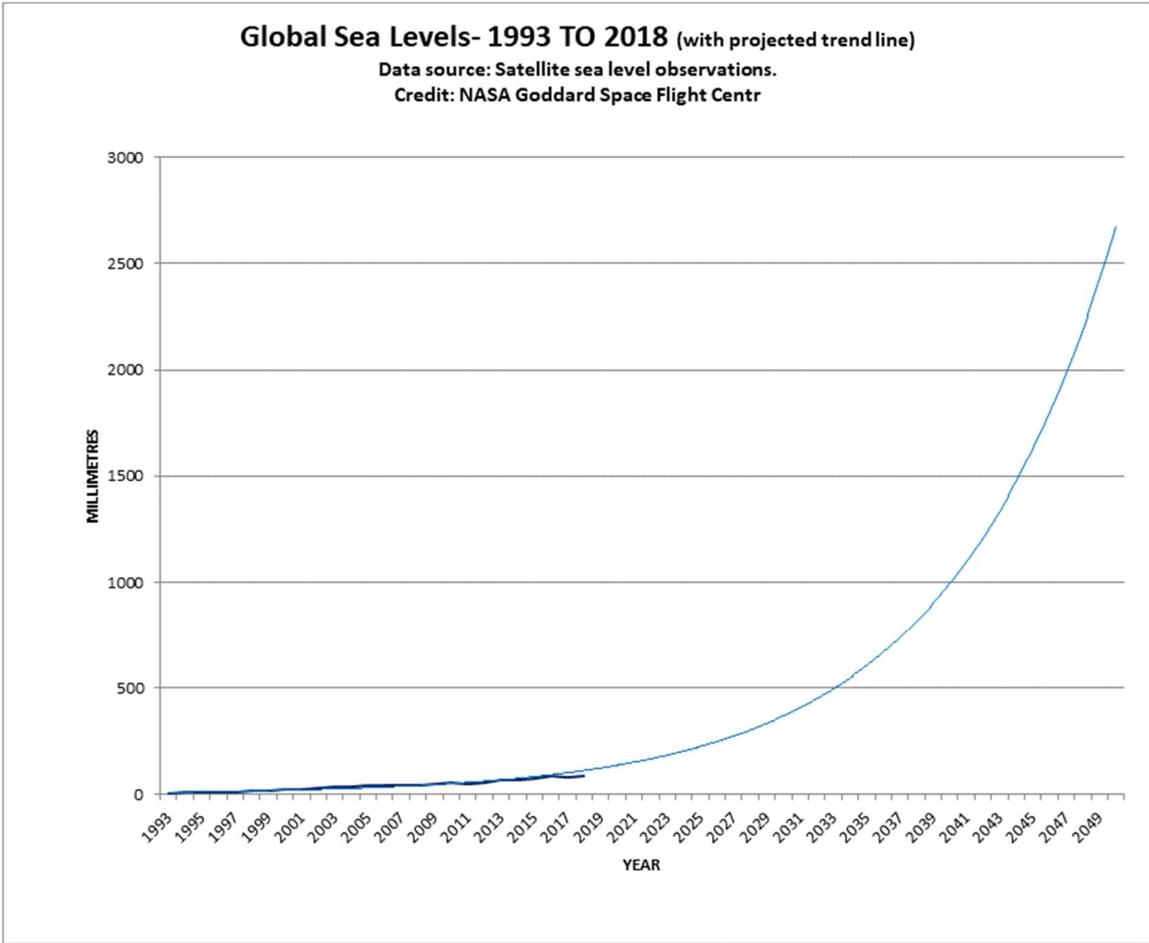
The impact statement for the proposed regulations includes statements on the potential impacts of climate change on Victoria. The first paragraph of the policy context statement is copied below.

Policy context

Potential impacts of climate change on Victoria Climate change is one of the most critical issues facing Victoria and the global community. Risks for Victoria from unmitigated climate change will likely include:

- sea level rise that will impact on coastal settlements, infrastructure and ecosystems. In Victoria, up to 48,000 residential buildings, 2,000 commercial buildings, 3,500 kilometres of Victoria's roads, and up to 125 kilometres of railways may be at risk of inundation from a sea level rise of 1.1 metres •

To put this threat into perspective, consider the graph I put together below. It's based on the last 25 years of sea level rises as measured by NASA with a projected exponential trend line. Recent research has discovered that the rate of sea level rise is increasing so the exponential curve is probably the most likely track rather than a linear one. It has no scientific basis but it's probably the likely scenario given the concerns being raised by climate scientists on impending ice sheet collapse. If sea level rise does occur as projected then the 1.1m rise will be reached in under 25 years. Given the economic and social cost this would cause we need to take much greater action on greenhouse gas emissions than is proposed by these regulations.



Yours sincerely,

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