Submission to Clean Energy Finance Corporation Amendment (Grid Reliability Fund) Bill 2020 (Parliament No. 46)

21 September 2020

Committee Secretary
Senate Standing Committees on Environmental and Communications
PO Box 6100
Parliament House
Canberra ACT 2600

Dear Senators,

I am writing this submission to express my concerns and voice my opinion towards the Australian Federal Government's proposed Bill that currently stands before Parliament to mandate a change to the Clean Energy Finance Corporation (CEFC) funding direction. This change will allow investment funding to be directed towards potential fossil gas development projects. This Bill should not be allowed to be passed for the reasons outlined in my submission.

EXECUTIVE SUMMARY

I am currently out of work, stuck at home in Melbourne under Stage 4 Lockdown in order to help stamp out community transmission of the novel coronavirus (The Bat Virus). I was absolutely astounded to learn about how Prime Minister, Scott Morrison along with Energy and supposedly Emissions "Reduction" Minister, Angus Taylor plan to direct taxpayer funds to help prop up an expensive, polluting and soon to be economically stranded gas industry.

The following submission elaborates my key concerns and frustration after more than a decade of energy and climate policy inertia. The lack of clear and concise policy direction has stifled prospects of further investment in clean energy developments, energy efficiency, storage and electric vehicles. These technologies are readily available and vital for our future.

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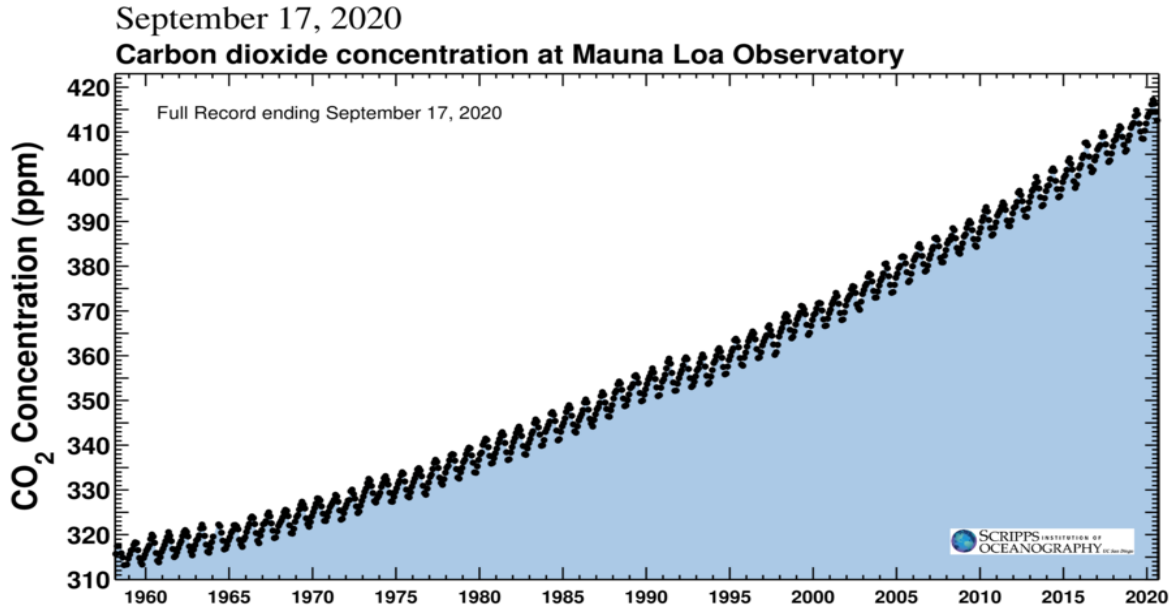
1. STATE OF EARTH'S ATMOSPHERE

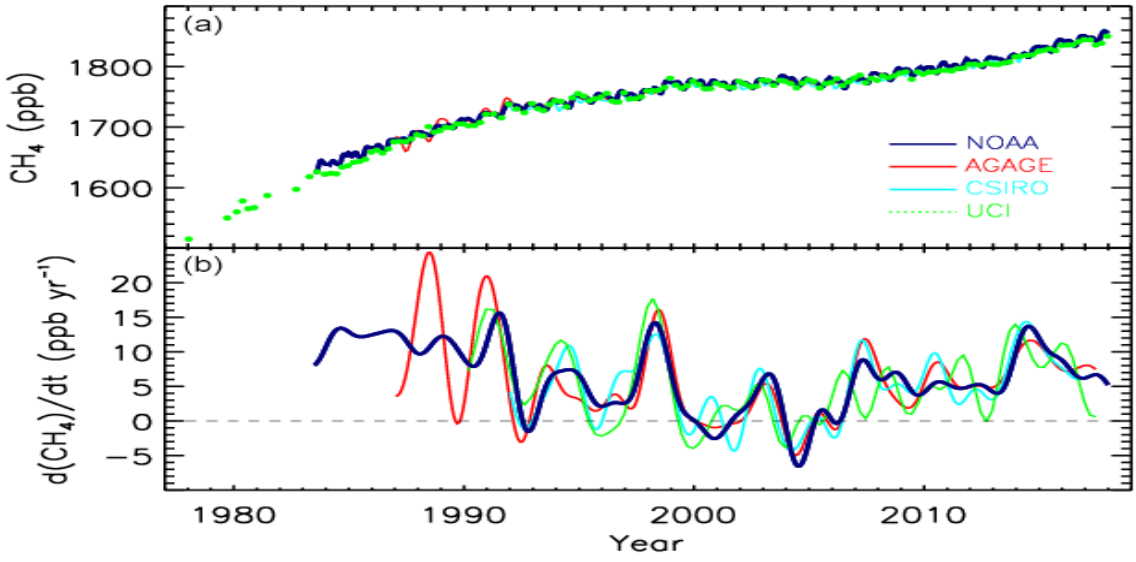
Earth's atmosphere is in dire straits at the moment. The Black Summer bushfires in Australia burned over 12 million hectares releasing between 650 million and 1.2 billion tonnes of carbon dioxide (CO_2) into the atmosphere, more than the whole of Australia releases in a year[1]. On top of this, the normally "unburnable" Amazon rainforest is on fire at the time of writing along with parts of the Arctic tundra and now much of the West Coast USA.

Atmospheric CO_2 Concentration - As shown in the following chart, the concentration of CO_2 in Earth's atmosphere reached a record 417 parts per million (ppm) in May of this year[2]. This is the highest level ever seen on Earth in over 3 million years[3].



Source: CO_2.earth

Atmospheric Methane Concentration - It is estimated that the amount of methane in the atmosphere has more than doubled since pre-industrial times. It has increased over 300 parts per billion (ppb) in the last 40 years alone as shown in the top half of the following chart[4].



Source: The Global Methane Budget

2. MORRISON AND TAYLOR'S GAS PLAN

The plan involves amending the rules within the CEFC to direct over $1 billion worth of taxpayer funding that would otherwise be directed to clean energy projects to gas led projects involving the following[5]:

- Five new gas fields around Australia including:
  (i) Narrabri in Northern NSW
  (ii) Beetaloo Basin in Northern Territory
  (iii) North Bowen and Galilee Basins in Queensland
  (iv) Additional field off Western Australia's North West Shelf
- New gas transmission pipelines and gas hub, each with a potential 60-year design life
- Construct a new 1000 MW gas-fired power station in the Hunter Valley, New South Wales
- Other projects include various unproven carbon capture and sequestration (CCS) technologies

We are told that this plan is essential to help Australia "bounce" back from the economic recession largely brought on by COVID-19. It is also meant to help reduce carbon emissions, create jobs and lower energy prices for consumers. Taylor is even talking about the idea of setting up a gas reservation policy for Eastern Australia. Western Australia already has a gas reservation policy introduced in 2006. This policy was designed to reserve a minimum of 15% of all gas extracted from the North West Shelf to be used in the domestic market[6].

3. EASTERN AUSTRLIA'S LNG DEVELOPMENTS

Between 2014 and 2017, four energy oligarchs being, Conoco, Origin, Shell and Santos massively overinvested in three enormous liquified natural gas (LNG) export processing plants in Queensland. At the same time, they underestimated the effectiveness of their gas supply. The gas delivered from thousands of coal seam gas (CSG) wells in the Surat Basin have very low pressures and subsequently, have low production rates. As a result, the LNG plants were not able to receive the amount of contracted gas that they were obliged to sell into the international market[7]. This prompted major gas players to modify several pipelines to provide bidirectional flow to allow gas in other parts of the transmission network to be redirected to Queensland. The energy oligarchs used this to their advantage early in the peace effectively helping to suck existing gas basins in Victoria and South Australia almost dry[8].

These losers operating the LNG plants in Queensland have very long-term contract agreements. It is almost certain from the Australian Energy Market Operator's (AEMO's) own forecast that most of the gas reserves from potential new gas fields will be not be used domestically[9]. Instead, as The Australia Institute (TAI) indicates, it will most likely be exported overseas further pushing up domestic gas prices[10].

4. PEAK GAS CONSUMPTION

In terms of demand forecast, AEMO's March 2020 Gas Statement of Opportunities (GSOO), shows that Eastern Australia's overall annual domestic gas consumption peaked in 2012 at approximately 700 petajoules (PJ) and has since declined to approximately 600 PJ towards the end 2019[9].

Gas Power Generation – Gas Power Generation (GPG) has declined by an average of 50 PJ since 2012. This decline will continue in the next few years as older gas power stations (thermal and non-thermal) are retired. There have been some exceptions such as in Victoria

in 2017 due to the closure of Hazelwood that resulted in a temporary increase in GPG[9]. Despite AEMO's explanation, this was not an "unforeseen" closure because Hazelwood had already reached its technical end of life. If anything, it was actually a "delayed" closure.

Industrial - Gas consumption in the industrial sector remains relatively unchanged since 2012 largely due to the increase in gas prices since 2015[9]. AEMO forecasts next to no change here out to 2040[9].

Residential/Commercial – The residential and commercial sector has seen an average decline of 12 PJ since 2012 largely the result of increased energy efficiency measures, electrification and fuel switching[9].

As evident in AEMO's Slow Change scenario, the annual gas consumption in eastern Australia as a whole is forecast to decline out to 2040[9]. Even LNG exports will remain relatively flat out to 2040 as forecast by AEMO due to the LNG plants soon to reach their nameplate capacity[9].

5. RISK OF "LOCKED-IN" STRANDED ASSETS

AEMO's March 2020 GSOO states that the current Gippsland Bass Strait gas basins will reach their expected end of life in 2024[9]. Yet AEMO forecasts an increased emphasis on the development of renewable energy, energy efficiency and fuel switching. Consumers are already moving away from gas boilers and other appliances towards electric heating and heat pumps within the commercial and industrial sector to help lower their energy costs.

Interestingly, AEMO themselves argue that the proposed 1000 MW gas-fired power station is simply not needed[9]. As of Sunday 20 September 2020, Morrison sounds like he might have actually listened to the energy experts and revised this MW figure down from 1000 MW to 250 MW. However, even a 250 MW "baseload" gas-fired power station would be prohibitively expensive to operate[11]. Also, thermal (baseload) power stations whether they are coal or gas are not flexible enough. The reason for this is due to rapid improvement and cost reduction of battery energy storage systems (BESS).

BESS are now more competitive than both baseload coal and peaking gas generators. BESS systems are also more responsive to rapid changes in electricity demand. As a result, gas peaking plants are losing their economic potential to BESS and will risk becoming stranded in the coming years not to mention their associated gas infrastructure[9].

AEMO's 2020 Integrated System Plan (ISP) forecasts an additional 6300MW of new solar and wind projects along with more BESS and pumped hydro entering the National Electricity Market (NEM) by mid 2026[9]. The ISP also supports the establishment of several Renewable Energy Zones (REZ's) in Queensland, New South Wales and Victoria[12].

I feel that with more and more industries and consumers falling out of favour with gas on top of a decline in GPG, Morrison and Taylor's gas plan risks the creation of potentially "locked-in" stranded assets.

6. MISALLOCATION OF IMPORTANT CEFC FUNDING

For over a decade, large scale renewable investment has been impeded by both climate and energy policy paralysis brought on by a failure of successive federal governments (Liberal and Labor) and not to mention The Greens. There have been several failed energy policy mechanisms such as the Emissions Trading Scheme, Clean Energy Target and the National

Energy Guarantee to name a few. This checkered history shows that the Federal Government cannot be trusted in the allocation of important CEFC funding. It seems that our Prime Minister, who infamously brought that lump of coal into Parliament in February 2017, has given up on coal and has shifted his attention to gas. Yet there is no proper roadmap to address the following:

- Renewable Energy Target ends at the end of 2020 – "We're on a road to nowhere"
- No meaningful federal energy or climate policy going forward beyond 2020
- States forced to set their own renewable energy and emissions reduction targets
- Next to no interest in electric vehicles (EV's)
- No date set for zero emissions target (hardly a roadmap with no target date)

7. PREFERRED ALLOCATION OF CEFC FUNDING

South Australia, has been the leader in investment in both large-scale and rooftop solar PV and wind energy projects in Australia along with three major BESS projects[12]. As a result, the South Australian grid has become increasingly cheaper, more secure and more reliable[12]. This has even allowed South Australia to ride out several disruptions earlier this year and in 2019 where their electricity grid was temporarily cut off from Victoria[13].

What is urgently needed is more CEFC funding directed towards continued decarbonisation of the electricity sector in other states, especially Queensland and New South Wales that are heavily coal dependent with several large coal generators approaching retirement. Other sectors needing decarbonisation include transport, residential, industrial heat and stationary energy to help lower energy costs and support advanced high-tech manufacturing industries.

A range of recommendations for where CEFC funding should be directed are listed below[9,12].

- Energy efficiency measures for the residential commercial sectors such as improved insulation, glazing and draft-proofing to reduce gas consumption[14]
- Greater use of electric appliance for cooking, space heating/cooling and hot water in the residential and commercial sector backed by solar PV. This recommendation requires good customer incentives to encourage residents and businesses to dump gas[15].
- Increased uptake of demand response systems to enable improved management of energy consumption[12]
- Increased rollout of BESS to help provide grid stability and support as well as and small-scale community BESS to support regional towns[12]
- Fast-track major long-distance high voltage interconnectors to help deal with AEMO's recently talked about "system strength" issues within the National Electricity Market (NEM)[12]:

(i) South Australia and New South Wales Interconnector (Energy Connect)
(ii) Second Bass Strait interconnector (Marinus Link) to help tap into Tasmania's proposed "Battery of the Nation"
(iii) Queensland New South Wales Interconnector (QNI)
(iv) Queensland's Copper String 2.0 to tap into Queensland's vast solar resources out west that would help deal with evening peak demand on the coast

- Fast-track approvals of the 2000 MW offshore "Star of the South" wind project off Victoria's Gippsland Coast. Benefits here include helping improve system strength and provide job opportunities for displaced Hazelwood Power Plant workers[16].
- Support rollout of electric vehicles (EVs) to help provide an incentive for improved energy management since EVs can soak up excess solar PV generation during the daytime and provide Vehicle to Home support, reducing evening demand peaks[12]
- Support development and expansion of green hydrogen technologies for integration into the NEM such as the Tonsley Hydrogen Park, currently under construction in Adelaide[17]

8. CARBON EMISSIONS INTENSITY OF GAS IS RISING

Morrison and Taylor continue to promote gas as a clean transition fuel. A report from the International Energy Agency (IEA) indicated in 2018 that the production, transport and consumption of natural gas is responsible for the fastest growing atmospheric CO_2 emissions[18].

This contradicts what Taylor keeps saying in terms of using gas to reduce emissions. When properly combusted, natural gas produces about half the CO_2 emissions of coal for the same amount of energy. Yet considering the whole journey of gas from extraction to consumption as explained below, the carbon emissions are considerably higher[7]:

1. Production – Emissions of CO_2 and methane from both onshore CSG and offshore gas fields result from energy use onsite for power, drilling and compression to transport gas to LNG plant or directly to end-user
2. LNG Processing and Liquefaction – This stage is among the most energy and emissions intensive due to the gas turbine driven refrigeration compressors that liquify the LNG (typically around 8% of natural gas is consumed here)
3. CO_2 Venting – All gas production sites whether onshore or offshore contain CO_2 as an impurity (often between 3% and 9% by volume). This must be removed to prevent plant and equipment damage. Many older depleted fields contain higher levels of CO_2. Most LNG plants simply vent the CO_2 into the atmosphere.
4. Transport – Shipping LNG is also energy intensive resulting in significant CO_2 and methane emissions as does transporting gas by pipeline
5. Regasification (for some consumers) – The LNG needs to be regasified before it can be sold to the end-user that is another consumer of energy and emitter of CO_2 and methane.

9. FUGITIVE METHANE EMISSIONS

The amount of fugitive methane emissions from the oil and gas sector is rising around the world, particularly in the USA and Australia largely due to poor leak detection standards. As a result, methane emissions have been grossly underreported[19]. The effect of methane's Global Warming Potential (GWP) is vastly greater than that of CO_2. Over a period of 100 years, methane's GWP is over 25 times that of CO_2. However, when measured over 20 years, the GWP increases to over 80 times that of CO_2. This means, even a small release of 2-3% methane is more damaging to the climate than coal[4]. In other words, if you leak as little as 3% methane, you may as well burn coal. This will further complicate Australia's relatively modest Paris Agreement of 26% to 28% emissions reduction from 2005 levels by 2030.

Considering all this, the idea of Morrison and Taylor promoting gas as a so called "clean" transition fuel is complete madness. It is essentially nothing more than marketing spin on behalf of the gas industry[11].

10. WHAT ABOUT CARBON CAPTURE AND SEQUESTRATION (CCS)?

Morrison and Taylor like to promote the idea of carbon capture and sequestration (CCS). A slight problem here is that CCS is still an expensive and unproven technology. It has never worked for coal-fired power stations, despite over $1.3 billion being spend on the technology since 2003 according to TAI[20]. It is hard to believe that CCS will ever work successfully for the gas industry either. A major problem with CCS is that there are not many suitable locations in Australia where CO_2 can be safely sequestered[7].

So far, there has been one facility in Australia that actually sequesters CO_2 underground. Chevron recently commissioned their massive Gorgon LNG export plant located on Barrow Island. This plant was legally required by the Western Australian Government to capture and store up to 8 million tonnes of CO_2 annually after the plant came online in 2016. Instead, due to "technical difficulties", Chevron only started partially injecting CO_2 underground in August 2019, over two and a half years late. Even when the CCS plant is fully operational, whenever that will be, the Gorgon LNG export plant will continue to spew out over 5 million tonnes of CO_2 annually into the atmosphere[7]. There is also no guarantee that the buried CO_2 will actually stay there.

11. CONCLUSION

It is clear that what we are seeing here is a complete lack of imagination, planning and foresight from this Federal Coalition Government in terms dealing with the COVID economic recovery and our future energy challenge. As I have discussed above, amending the CEFC Mandate to allow $1 billion of taxpayer funds to be directed towards expensive and dirty fossil gas projects should not be allowed to proceed.

The risk of these projects becoming economically stranded along with the associated carbon emissions are simply too high and will steer Australia in the wrong direction. There are cheaper, cleaner and more sustainable alternatives that should be considered as outlined by AEMO's GSOO and the ISP[9,12]. We don't need to wait for Taylor's "technology roadmap". We already have the technologies available to do this right now. What we do need is proper planning and policy direction to encourage and maintain investment in the right projects. That way, through the recommendations discussed above, Australia can be better placed for a secure, affordable and reliable energy future and move towards net zero emissions well before 2050 for our future generations' sake.

And lastly, as I quote from Australia's former Chief Scientist, Professor Penny Sackett, in order for Australia to meet its 2030 Paris Climate Agreement, "*The role of gas needs to be a significantly declining one.*"[21]

Thank you for taking the time to read my submission.

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Engineer

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