Committee Secretary,
Senate Select Committee on Climate Policy,

Dear Sir,

In response to your invitation, we write to outline our proven and economical system for the capture and sequestration of greenhouse gasses.
The system does need to be scaled up to power station size, which should improve the efficiency of the system. The “500 GPD Prototype Acoustic Liquefier”, attached, needs to be scaled up by 50 times to 25,000 gallons per day (GPD). The modular units can be added to as required.
The cost of doing this (some $40 M) is estimated in the GANTT chart, attached. Funding requested is before the Governments, has been for four years.

We would be happy to appear before the Select Committee to further explain the technologies involved.

Our patented pulse combustion powered thermoacoustic refrigeration (PUTAR) of greenhouse gases can capture 100+%, liquefying the gases for $3.00 per tonne (capex and opex) and it is possible to safely sequestrate, effectively forever,(see “Nat. Academy CO2 storage”, attached) the liquefied gases under the sea bed, below 3,300 metres of sea water for some $10 per tonne.
See Case 7, in “8-PUTAR-cost-scenarios”, attached.
In Case 7, PUTAR is expected to produce 50% more electricity (value $20.50) per tonne of coal burnt and does not require cooling water, currently some one tonne of water per Megawatt hour (MWh) of electricity.
Case 7 results in a **lowering** of power costs by $2.30 per MWh.

Hence 100+% of the greenhouse gases have been removed from the atmosphere at a profit. See “Fig. 1. Process Diagram”, attached.

The above covers point 1 (a) (i) of your Terms of Reference and (ii) should be covered by the profit incentive – a tax helps.

Coal fired power stations contribute 50% of the Australian output of greenhouse gases. The use of PUTAR technology, in Australia and internationally, answers your Terms of Reference point 1 (a) (iii). In addition it helps Australian exports of coal and retains our aluminium industry, amongst others.

Relating to Terms of Reference (1) (b), for some 30 years the writer and associates have studied wind power and apart from the visual pollution it cannot produce adequate supplies of power, which can be shown mathematically. The same applies to solar power. Tidal power can do it, currently at an unacceptable cost.
Carbon storage in fast growing trees we have studied and believe it is worthwhile, particularly if a reliable outlet for the timber/biomass can be developed.

Addressing Terms of Reference point (1) (c) we believe a 50% reduction in greenhouse gas emissions will be effective and can be achieved, as above. Three years to produce pre-production prototypes and a further two years to have them in widespread operation. A 200 tonne per day unit should cost less than $2,000,000 in mass production, an affordable price.
The 50% reduction is made more certain (hard to convert all the power stations) by the use of LPG as a vehicle fuel in place of petrol and diesel. Replacing petrol with LPG reduces carbon dioxide (CO2) by 40% and that figure would rise to 50% if the variable compression Environmental Engine (EE) were to be introduced. EE is running in the UK, is administered by Docklands Science Park and reduces engine emissions by 50%. Adding LPG to EE means a 50% to 70% reduction in engine emissions. Diesel emissions of nitrates, which are particularly harmful, can be reduced by 45% at least, most probably 65 to 70%.
Australia has a large, some 9,000,000 tonne, surplus of LPG and we import more polluting supplies of petrol and diesel. A double cost penalty.

Terms of Reference point (1) (d) is hard, but we believe 50% is a fair target that we can reach with our current knowledge. It seems to us that science has to set the targets in response to the climatic signals and we have to reach those targets.

Our belief is that the technologies outlined are attractive in their economic returns, both to individual industries and to Australia as a whole. Terms of Reference point (1) (e).
We consider it important that Australia does not lose its advantage of plentiful supplies of cheap energy and that we are able to convince China and India to join with us in using the technologies discussed herein. The export of our coal, accompanied by clean CCS is very important.
The conservation of our water supplies is important. PUTAR does not require cooling water. It is a cheap retrofit to an existing power station.

Proven technology
Thermoacoustic refrigeration was invented around 1878.
Thermoacoustics is explained in the “garret review article”, attached. Basically it is a pulse which travels up and down a helium filled tube providing areas of heat and cold, which areas can be linked by heat exchangers, in our preferred embodiment to provide temperatures to minus 165 degrees Centigrade, a temperature which provides for liquefaction of nitrous oxides, the hardest of the greenhouse gases to liquefy. The system does this quite easily, hence the economics.
The then Chief Scientist of Australia has reviewed our technology and recommended that grants be sought. We provided written information and did not speak to Dr. Peacock.
Professor Roy Jackson of Monash University, investigating on behalf of the Victorian Government, was most impressed by the technology, describing it as “an elegant solution to the problem”. His phone number is Int’l 61 3 9905-4552, at Monash. He did meet with us, to go over the claims made.
Dr. Carl Howard, School of Mechanical Engineering,The University of Adelaide, Phone direct: 08 8303 3469 is knowledgeable on thermoacoustics.

We would be pleased to provide any further information that you may require and in a science park we can always do with all the support that is available.

All the best,

John Martin,