

**The Senate  
Environment and Communications References Committee  
Inquiry into Fair Dinkum Power**

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13th February 2019

**Introduction**

My name is Gary Rowbottom. I was invited to make a submission into the Senate enquiry into “Fair Dinkum Power” I have lived in Port Augusta in South Australia all my life up until August 2017. I worked as a mechanical technical officer at the Port Augusta Power Stations for over 17 years up until the time of its closure in May 2016, Following the power station closure, having unsuccessfully sought long term employment in my home region, I took up a position as a mechanical technician at a Central Queensland coal fired power station in August 2017.

I am 57 years old. Since mid 2012 I have been actively campaigning to have concentrating solar thermal (CST) with storage power stations constructed in the Port Augusta region, as first proposed in Beyond Zero Emission’s Report “Repowering Port Augusta”. I am currently Chairperson of the local “Repower Port Augusta” community group advocating for that construction of CST in Port Augusta. With Solar Reserve having been awarded a 20 year contract in August 2017 to construct their 150 MW power station, with 8 hours full load storage, in Port Augusta our group is now largely inactive, and are trying to wait patiently for construction of the facility to begin.

I offer my thoughts on the Terms of Reference on this enquiry based on my experience as a worker in coal fired power stations and as a community advocate for renewable energy, and someone deeply interested in both the power industry in Australia and globally, and in ensuring a sustainable environment for future generations. All that follows are my own personal thoughts and opinions; I am not representing Repower Port Augusta or any other organisation with this submission.

**Submission comments related to Terms of Reference**

- a. *the potential for empowering energy consumers to play a more important role in the National Electricity Market, through providing diverse services in:*
  - i. *energy generation,*
  - ii. *demand response and energy efficiency,*
  - iii. *grid stability and reliability services,*
  - iv. *alternatives to conventional network investment, and*
  - v. *peer-to-peer trading between households and businesses;*

This is not an area I have particular expertise in, so I will only make some general comments. Agencies such as ARENA, Renewables SA and other state based renewable energy agencies, and a variety of other organisations active in this area are more authoritative sources of information.

I do believe there is potential for energy consumers, domestic and commercial, to play a greater role in energy generation, demand response, energy efficiency, grid stability and reliability, as per i, ii, and iii above. I am less sure about the areas of alternatives to conventional network investment (iv) and peer to peer trading between households and businesses (v).

A basic way to involve consumers to a greater degree in energy generation is to continue/increase the uptake of solar PV, at domestic, commercial, community and utility level. This has been happening at an increasing rate over the last decade initially mostly at domestic level, and has spread into the commercial sector and utility scale projects over the last few years have started to accelerate. The economics is largely driving this deployment and there is certainly scope to continue.

I particularly advocate for programs like the recently reinstated program by the SA Government to provide 50,000 homes with free solar PV and battery systems, all integrated into a virtual power plant (VPP) that is controlled by the network operator to charge and discharge the battery systems in a coordinated manner most compatible with the needs of the grid. I understand the 50,000 home PV/battery program of the SA Government is approximately equivalent to a 250 MW power station. Furthermore this program prioritises for less well off consumers that otherwise would have no hope of participating in the personal cost saving benefits of a domestic PV system. As I understand it, these systems are essentially paid for by the equipment provider as the saving to the consumers over the life of the systems is in the order of 30% whereas the full reduction in consumer's electricity bills would fall in the range of more like 40 – 75%. That difference is how the payment to the equipment providers happens, as I understand it. I believe some other states are operating similar schemes. Other programs are also offered for subsidised PV and/or battery equipment (in some cases possibly integrated as a VPP), which are of benefit, but effectively out of reach for the poor (who are most in need of relief from high energy bills) as they cannot afford their part of the contribution.

I believe it in the best interests of reliable network operation and therefore consumers to have a good portion of PV generation visible to and where possible, controlled by the network (ie, be demand visible to the network operator with the network operator having the ability to control the charging/discharging of storage systems – that will be useful to help balance generation supply and demand. The majority of systems now in the domestic and commercial sectors are invisible to the network operator. The growth in utility scale PV in particular and further wind farms and future pumped hydro systems will all contribute to grid stability and reliability. Mostly this falls outside of the sphere of control of consumers, as do the valuable role that technologies such as concentrating solar thermal with storage can bring to the grid stability and reliability.

I also very much like schemes such as operated by CORENA, an SA based organisation that funds solar PV generally on community based assets (such as aged care homes, community halls and the like) to save money for the owners (and occupiers/users) of these facilities that again struggle with finding the upfront cost themselves, and most importantly reduce emissions as we must to avoid the worst effects of climate change. In the case of CORENA, funds are obtained from donations, loaned to the recipient group and are paid back (I think no interest) with repayments falling within the band of savings realised on electricity bills. Once the system is paid off the recipient group realises the full extent of the savings on bills from the PV system, for the remaining life of the system. The revolving fund model used has given CORENA its original money back and uses it to fund another system. Ongoing donations allow parallel funding of multiple projects. In the case of CORENA, this is a philanthropic organisation and makes no profit, maybe there are small administrative costs that funnel off a very small amount of the input funds. This model maximises benefit to wider society. I think there are other organisations operating along broadly similar lines, and I think these should be encouraged and for that matter

there is no reason they could not be funded by government or commercial/industry, and in deed I believe there are state schemes that attempt to follow broadly equivalent strategies. Theoretically the schemes could end and the donors effectively get back their original donation amount at least. Banks could perhaps atone for some of their recently discovered sins and be a participant in such schemes.

It is also an idealistic dream of mine that the complete body politic could agree on the goals and action required to deal with climate change and set irrevocable bipartisan measures to actually take the necessary action. Then funds currently farmed by a considerable number of groups from the significant sector of the populace that wants to see this real action on climate change occur, could be used for this type of real action, rather than for funding climate change campaign actions, conferences, flyers, banners, TV/Radio/Social media ads, billboards and the like, and likewise the fossil fuel industry organisations could desist from similar expensive campaigns such as the deceitful series of TV ads promoting “HELE” coal fired plants in Japan.

I am sure some people will be interested in demand response services, and this has been explored I understand with some success by AEMO, and this has potential to empower consumers to participate in providing these services. However I do overall think a higher level goal of the power supply being moulded to fit consumer requirements is the prime objective – but demand management can play a part in the supply/demand balance in grid critical times.

There does not seem to have been much implemented in any specific energy efficiency measures. This area as I understand the issue holds potential to offer big savings to consumers, and more importantly, corresponding decreases in CO<sub>2</sub> emissions. The commercial sector, accounting for in the order of two thirds of energy use, may be the prime area to pursue this avenue. The prime difficulty I think is that most people and businesses can only purchase and install more energy efficient machinery and infrastructure when the existing systems need upgrading or replacement. New builds do of course have the opportunity to incorporate high levels of energy efficiency into the infrastructure at construction, and such behaviour should be encouraged and incentivised to the extent possible.

As to the issue of consumers playing a larger role in providing alternatives to conventional network investment, I see the major benefit is that distributed renewable energy (fair dinkum power) can decrease the load on the existing transmission and distribution networks, and hence eliminate, reduce or defer the need for network upgrade, all cost saving outcomes. Furthermore distributed variable energy sources (especially storage equipped) can reduce impacts of network supply interruptions. For that matter a greater number of smaller utility scale generation sources, a characteristic of renewable generation sources in itself provides enhanced protection from supply interruptions as more supply points/paths exist. It is a similar concept to that which spawned the Internet. I may point out that the potential for these network performance improvements are a possibility enabled by the existence of renewable energy systems, and not by the type of fossil fuel “fair dinkum power” that our current Prime Minister, at time of writing, was intending when that phrase was coined.

On the issue of empowering consumers to provide services in peer to peer trading between households and businesses, I am a little skeptical of the value and a little apprehensive that it could foster a level of exploitation. It just seems to me to add a layer of complexity to a system already complex enough, and utility energy traders do not seem to have providing energy at the lowest possible cost to consumers as their driving force. Profit seems to be and I fear enabling consumer participation may have the same effect. However this is an area I know little about so I concede it possible my fears are unfounded and the greater competition will have a downward effect on prices. Fundamentally, as a citizen, all I want is to turn on my appliances, and have them work for their design life or better. I have no time or desire in my life to use either to buy and sell energy, and I can only imagine if I was a small / medium business operator my time/desire for those activities would be even less. Perhaps in very large organisations that have significant energy supply demand resources, and it is cost effective to employ people to manage such endeavours it could be a useful thing.

*b. the potential for these services to deliver lower energy costs and increased energy reliability;*

I have touched a little in the previous comments on how variable renewable energy and supporting firming capacity and such technologies as concentrating solar thermal with storage deliver increased energy reliability, but rather than me tell you that, take note of the Finkel Review, AEMO's Integrated System Plan (ISP), and a considerable number of reports commissioned via ARENA (and others), that all show the same things, and that lower energy costs will be delivered as a result of continuing the transition to renewable energy sources.

*c. the changing role of retailers in the National Electricity Market in light of the growing empowerment of consumers;*

No specific comments on this issue, other than that retailers, like generators and traders, are profit motivated, their goal is not to provide energy at the lowest possible cost to consumers.

*d. the impacts of privatisation;*

Privatisation was meant to lower prices and improve service delivery, via those wonderful market forces. However I don't believe that has been successful. Reduce jobs they indeed did, and therefore some costs. Certainly since the introduction of the NEM there have been more jobs in market analysis, trading, and the like (wannabe wolves of Wall Street??) maybe motivated and incentivised by maximising profits for their largely overseas owned corporations, but I don't see how that acts in the best interests of consumers.

The National Electricity Objective (NEO) is supposedly :

*"to promote efficient investment in, and efficient operation and use of, **electricity** services for the long term interests of consumers of **electricity** with respect to:  
price, quality, safety and reliability and security of supply of **electricity**.  
the reliability, safety and security of the **national electricity** system."*

Sounds great. Of course it really should now include reference to the need to lower CO<sub>2</sub> emissions to the lowest possible level too. But the electricity supply system does not seem to be geared to providing power at the lowest possible cost to consumers, but more to profits as I have mentioned. Even the Government owned corporations are so motivated, but at least that can be largely rectified by a well placed Government directive as demonstrated very clearly in Queensland in 2017.

The previous SA Government also recognised the privatised system was working against the best interests of SA consumers, and that saw the SA Government introduce some measures (intervention powers and emergency government owned generators) to take back some ability to influence the system with no motivation other than to

act in the best interests of SA consumers.

To me, with a frame of reference largely on the SA supply system, it seems that when the SA system was government owned as ETSA, the system was operated and controlled largely by engineers and other technical types whose interest and actions were driven by doing what was considered in the long term best interest of the system and the consumers, with a minimum of low value adding “parasitic” loading by marketeers, retailers, analysts and accountants. Since becoming privatised the management of the power systems seems to be pulled by very changeable political whims, short term profit making, and all manner of things other than having the system run efficiently and reliably.

Of course, the necessary goal to “very substantially reduce our emissions, a goal that will require almost all of our generation to come from zero or very near zero emission sources” has needed changes to how the technical make up and operation of the electrical supply network needs to be done. Unfortunately this has resulted in a massive political divide and political interference in the management of Australia’s power systems. The goal above is as good a general articulation of the emissions aspect of the current electricity system objective as I can offer. It was stated by a Federal MP who later became Prime Minister, until betrayed and excised by his own party (Malcolm Turnbull). If such a goal could be agreed once and for all, then all focus, energy, and cost could go towards achieving that emissions goal with the best technical and operational content to realise secure, reliable, affordable power, (and taking the impact on affected people into account too).

I don’t think you can make a good case that privatisation and for the matter, the market, has served SA well in recent years. The combination of corporate motivations and free market forces forced Northern power station to exit the market quite suddenly in 2016 at a relatively young age of 30, with little regard to how the SA electricity network would cope, rudely displacing 430 jobs in the process, mine being one of them. This happened while much older more emission intensive power stations remained operating. I do concede managing the exit of the remaining 19 coal fired power stations in the NEM does have its challenges, and many of those challenges are magnified being private enterprises. However, the major aspects of the necessary transition are relatively straightforward. It makes sense to decommission the oldest and most emission intensive stations first, (taking into account technical drivers like the nature and timing of the need for major component replacement due to exceedance of technical life etc). Reliable replacement of the energy capacity and volume to be decommissioned needs to be put in place mostly before the existing coal units are taken out of service (which could be done in a staged manner to smooth the process). Even so, the transition will be lumpy around the exit of coal fired power stations, and other large fossil units such as Torrens Island.

However what is not helpful is an irrational response from the market. Witness the SA experience. Alinta could not get market contracts for Northern Power Station output above the level needed to make any sort of profit, and they could not foresee that situation changing and hence rapidly exited the market, and as soon as they were gone, the market pool prices escalated significantly, which in turn drove up subsequent contract prices. Similar seems

to have occurred with the exit of Hazelwood in Victoria. I strongly believe the deplorable adversarial posturing that occurred in particularly the Federal political arena contributes to that behaviour. I am appalled to see that abhorrent behaviour in politics continues to this day, and likely continues to fuel exploitive market behaviours.

The other related issue I see with privatisation is that it incentivises short term / low cost seeking behaviour that is not necessarily in the best long term interest as expressed jointly by the NEO and the emissions reduction requirement. For example, deployment of large scale emission free storage technologies such as concentrating solar thermal with storage, or even pumped hydro (with associated emission free generation source to “charge” the hydro system), is more expensive and takes longer to build, than say a typical wind or PV farm, and hence there are no new utility facilities of those types yet operational with significant storage. In the case of the exiting pumped hydro facilities, these do not seem to be utilised as much as they could be. These different technologies may be a little more expensive just based on capacity/volume capability but as they provide all important despatchability and other needed services like system strength enhancement and system inertia, they have greater value.

I think of it like a car, you need an engine/transmission, a chassis, and a cabin compartment to comprise a car fit for purpose. You don't not have, say the engine/transmission because it is the most expensive. Similarly the electricity system is exactly that, a system, and you need different components with different needed attributes to make up a fit or for purpose electricity system. Whilst one type of needed technology may be more expensive considered in isolation, when you consider the system as a whole the summed and averaged component costs are not so scary. Further, technical input and analysis is needed to direct which types of storage and generation, located in which locations best suit the ever evolving grid – total “technology agnostic” acquisition and placement of generation/storage is likely not a good thing, calls need to be made by appropriate technical people. I nominate AEMO for that role. You can easily see how much trickier it is to put the right components of a good electricity system in the right place at the right time in a privatised industry where judgements are largely on return from individual components without consideration of what has to happen in orchestrating all the individual parts to provide the necessary overall system performance. Certainly in SA's case large scale storage is now the key need, and action on that needs to be taken particularly ahead of Torren's Island A and B closures. At present the removal of TIPS A looks like being covered by new gas generation and some utility scale renewable projects, OK for the NEO I think, but not the best result we could have had on emissions. TIPS B will be a more challenging withdrawal of existing capacity.

I really do hope appropriate people are properly on to that issue and will guide actions congruent with the joint objectives of maximising emission reduction and achieving the NEO. I guess that job in SA, must reside with the SA Energy Minister, and I must say rather less optimistically also with the Federal Energy Minister.

- e. regulatory reforms which would empower energy consumers, including the following key groups:*
- f. households, including low income households and renters,*
- g. farms,*

- h. small businesses, and*
- i. major energy users;*

No additional comments on this issue, other than I would like to see renters be able to participate more in cost (and emission reduction) provided by solar systems, and I strongly advocated for the type of system that enable low income households to achieve personal cost reduction (while contributing to emission reduction) – I covered that aspect under my response to Term of Reference a. Where possible I also think farmers should be assisted to participate in the benefits of ongoing renewables and relevant storage deployment.

- j. the likely long-term impacts, including to emissions, reliability and stability, of energy consumers playing a larger role; and*

A base assumption is that if consumers will play a larger role in the electricity system, it will be in distributed variable renewable energy (and perhaps some smaller utility scale community owned systems and microgrids). Accordingly, increased deployment of renewable energy technologies will of course lower emissions. And as I have already said, if the systems includes enough storage and other attributes such as system strength and inertia etc (ability to supply FCAS and SRAS services), then reliability and stability is enhanced rather than reduced compared to both the system we have today, or the system we had two decades ago, before the rise of renewables.

There are recent developments and announcements of large industrial scale too, such as that by the new owner of the GFG Alliance including the Whyalla steelworks, who have announced utility scale renewable energy construction projects in SA of a variety of types (PV, battery, pumped hydro). I think these projects total over 1GW in capacity, and construction of the first (a solar PV farm) is expected to commence in 2019. I guess this fits the definition above of an energy consumer playing a larger role. These plans above exceed the demand from the steelworks by a considerable margin, and will thus impact on the wider grid. Mr. Gupta's plans alone have the potential to significantly lower electricity sector emissions. Mr Gupta has made no secret of the fact that he has chosen the path of renewable energy as the most cost effective path.

Also I believe AEMO's ISP clearly places variable renewable energy (including distributed energy resources (DER), which includes domestic and commercial solar systems) with appropriate firming resources as the lowest cost new generation over the period of the plan (2020 to 2040). The ISP promotes the concept of Renewable Energy Zones, with Transmission upgrades/additions to support it, rolled out in a coordinated, prioritised manner, and taking into account the timing and magnitude of the exit of large fossil based generators in the NEM. This seems a very sensible approach, there is likely a case to retire existing plants or at least some of them earlier than 50 years of age to obtain a better outcome on emissions reduction, but the roadmap provided by the ISP is I believe very sound.

*k. any other related matters.*

In some responses above I have deviated a little from the given Term of Reference, those digressions can be considered as given under this “any other related matters”. Below are some other comments on our energy/environment situation.

I will always be grateful to, and appreciative of, the many men and women who have, and still do work in coal and gas fired power stations and their associated mines and fields, to produce that fantastic product, electricity, that enriches all of our lives. I was one of them, I worked as a mechanical technical officer at Augusta Power stations in Port Augusta for over 17 years. My father worked at that station for probably longer. My son worked there too for a period as a mechanical engineer. I still work in a coal fired power station, in Central Queensland.

But whilst coal fired power is still important right now and will be for at least a decade or maybe two, it must necessarily come to an end. We must drastically cut our emissions as a nation and globally. That does mean we must transition away from fossil fuel use, and tackle all the other sources of greenhouse gas emissions, not just electricity, the easy one. The science of climate change should largely dictate the pace of the transition.

But we must make the transition as painless as possible, to the electricity system itself, and to the people and communities affected, like we could have done with my home town of Port Augusta.

We don't need the entire precise answer before we start. Like driving at night, you don't need to see the whole road ahead to your destination. If you start out on the right road knowing where you want to go, alert for threats and opportunities, you will arrive safely. The words from Minister Turnbull I quoted in response to d, pretty well outline what our destination is. All our focus should be on making that energy transition journey as safe and trouble free as possible. That is what most Australians want, and what we should continue to focus on.

But so far, we seem to be still stuck on not being able to even agree on that destination, where we want to end up. Those places like South Australia are forward scouts on this journey that the rest of Australia, and the world must make. And yes they have suffered some casualties, been involved in some damaging firefights, and taken a few hits along the way. The learnings from that will make it safer for the world that must follow that same journey. That is why it is so deplorable that the bullets in SA's back all have “Made in Australia” stamped on them.

Sadly, it does not look like the current Federal Government has an emission free destination in mind. It certainly has not clearly articulated it. The Federal Government used the term “fair dinkum power” as a very thinly veiled euphemism for wanting more fossil fuel power stations, exposing its poor understanding

of what the necessary emission reduction task requires and what constitutes secure reliable power, which is largely a supply that matches demand at all times and meets the technical standards in regard to voltage and frequency, and has adequate attributes such as system strength and resilience against fault currents. Let's focus on how best to achieve that with a very largely emission free electricity supply network shall we?

Should the Inquiry desire further input or clarifications from me in connection with my submission or progress of the Inquiry I will endeavour to do my best to accommodate. Fair dinkum.

Yours faithfully,

Gary Rowbottom,