SUBMISSION TO SENATE ENQUIRY

into

WINDFARMS

by

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A windfarm is a loathsome thing, God wot,
Upon our pristine landscape it's a blot.
It's noisy, so it's mostly wind and hiss,
A thing if you don't have, you'll never miss.

Feb. 2011

SUBMISSION to the SENATE INQUIRY into the SOCIO-ECONOMIC EFFECTS

of

WINDFARMS

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SOCIO-ECONOMIC IMPACT OF WINDFARMS

Executive Summary

This submission addresses the narrow terms of reference, but it also considers the contribution which windfarms make towards the ultimate goal of replacing fossil fuel in the generation of electricity. Are the social and environmental impacts more than offset by the benefits windfarms can provide? My conclusion is that while windfarms may supply a need in some locations, there are far better ways of maximizing renewable energy generation in co-ordination with existing steam generation plants which will be with us into the foreseeable future.

My personal experience is confined to proposed windfarms in the Tarago-Bungendore area and on the Monaro. In both these areas the proposals have brought about bitter divisions in the communities polarizing them to the extent that erstwhile friends have become bitter enemies. This has often arisen because property owners have proposed windfarms on parts of their property remote from their own residences, but close to other residences. I appreciate that landholders, in difficult times, look to means to supplement their incomes and the lease fees paid by windfarm operators can help, but public benefit must support this.

On the Monaro there were proposals to plaster wind turbines all over a pristine landscape including outstanding landmarks such as the Three Brothers. Much of the impetus has come from coastal areas well removed from the Monaro. However there is one classic case of approval by the Snowy River Shire Council for a windfarm on Snowy Plains, which was in direct conflict with their own LEP and was opposed by Council staff. In the event all have been withdrawn, except for one between Nimmitabel and Bombala, the construction of which has not yet commenced.

During discussions in the U.K. with a group opposed to windfarms I was told that, although the loudness of the noise was not severe, the constant and regular swishing noise as propeller blades passed the support pylon became very disturbing over a period of time for people living nearby. This needs further investigation.

Wind turbines are monstrous machines for a comparatively small unpredictable output. A machine with a 100 m. diameter propeller can produce a peak of 2.2 MW, whereas a hydro-electric turbine runner in Murray I Power Station of less than 2 m. diameter can produce more than 100 MW.

Wind turbines, as with water turbines, after hundreds of years of development and research, have reached a stage where any increases in efficiency will be incremental only. Wind turbines do not fit well into a base thermal generation system which requires that the power be produced on demand in peak periods or when thermal plant is not available. Wind turbines do not fit either of these criteria and, as explained in Appendix 2, their production of electricity during off-peak periods can be an embarrassment.

The evaluation of the contribution which any proposed renewable energy scheme can make must be considered in the context of a peak daily demand of between 20 and 30 thousand MW in the Eastern grid and 10,000 MW in N.S.W. alone. Compared with their social and environmental impact, the contribution which can be made is pitifully small and there are much better ways to spend money.

As a highly qualified and experienced professional engineer engaged in renewable energy projects for nearly 60 years I am appalled at the nonsense and waste currently being propagated. My experiences and comments on a wide range of issues relating to renewable energy are set out in the attached appendices. They extend far beyond the narrow brief of this inquiry. Many are satirical. Whether any organization or person considers or even reads this publication does not concern me.

Amongst many matters of concern is the propensity for technologically illiterate senior bureaucrats to hire equally technologically illiterate consultants to produce voluminous reports justifying irresponsible proposals, all at taxpayers' great expense. A classic case is set out in Appendix 6.

Since completion of the Snowy Scheme on which I worked for 23 years, most of my and my colleagues' work has been overseas where Professional engineers are much more appreciated and much better rewarded than here.

Introduction – Personal Qualifications and Experience

I am a professional engineer and my qualifications are:-

Bachelor of Engineering (with Honours), University of New Zealand
Member, Institution of Engineers, Australia
Chartered Professional Engineer

Post Graduate:-

Inservice Training fellowship, United States Bureau of Reclamation
Diploma Nuclear Power Engineering, University of N.S.W./Lucas Heights
In service Training, Natural Gas Transmission, Gaz de France/British Gas

I worked for 23 years with the Snowy Mountains Authority (SMA) on the design and implementation of the Snowy Mountains Hydro-Electric Scheme, regarded as one of the top seven Engineering Wonders of the World. This was followed by 13 years with the Snowy Mountains Engineering Corporation (SMEC) and from 1987 onwards as a private Consultant.

I am using this invitation as a vehicle for chronicling the events and circumstances in my career, spanning 60 years, and which have mainly been devoted to renewable energy projects. Whether or not it is used by any official body does not concern me, as I have long ago from my perspective, decided that Australia is a great place to live providing you don't take it seriously. Over the years, based on my experiences, I have developed great cynicism and I conclude that Australia has no peer amongst O.E.C.D. countries as a technologically backward country. Two such instances in my career, listed in Appendix 5, confirm that opinion from my perspective. At times I didn't know whether to laugh or cry until I recalled the old adage:-

"Laugh and the World laughs with you.
Weep and you weep alone."

Needless to say, the laughter at times borders on the hysterical.

I have found that considered factual presentations are ignored and so I have changed to writing satirically. Articles in this vein are frequently printed in Cooma newspapers, but never in city newspapers. Some are presented herein as appendices.

The views expressed are entirely my own and I represent no organization.

Socio-Economic Effects of Windfarms and Relationship to Other Renewables

In considering the socio-economic effects of windfarms, consideration needs to be given to the contribution they can make to the national electricity grid and whether or not there are better alternatives. Peak demand varies often on a daily basis, between 20,000 and 30,000 MW. It touched 30,000 MW for one day only in 2008. I believe that the contribution windfarms can make to a demand of this magnitude does not warrant their installation en masse when the social, environmental and cost factors are weighed against their miniscule and random electricity production.

I attended a forum on wind power 3 or 4 years ago when a boffin proclaimed that 1,000 wind turbines could replace a 685 MW coal-fired power station. I tried to explain the logistics and impact of 1,000 of these monsters, even if they were scattered all over the countryside. The cartoon in Appendix 7 would give some indication of the effect if they were all together. The 1,000 wind turbines, replacing a 685 MW thermal station would provide less than 3% of a 25,000 MW peak daily demand.

I am aware of the social consequences of proposed windfarms on the Monaro and near Tarago, N.S.W. In both areas the communities were polarized and life long friends became bitter enemies. On the Monaro, in particular, it was proposed to plaster these monsters over well-known landmarks, and also along the Monaro Highway between Cooma and Nimmitabel. A windfarm proposed for Snowy Plains was approved by the Snowy River Shire Council, although it breached the provisions of their L.E.P. and was opposed by Council staff. In the event most of the proposals have been withdrawn, except for one proposed windfarm on properties in the Bombala region.

While on a visit to the U.K. some years ago I discussed windfarms with a group opposed to them and obtained a copy of a booklet, "The Case against Windfarms". One of the points made in this booklet was that, although the loudness of noise was not a problem, the constant and regular swishing noise as the turbine blades passed the support pylon became very disturbing after a period. Although not as severe, it was likened to the old Chinese water torture whereby a drop of water made to land regularly on one spot on a person's forehead could drive them completely insane within a few days. One of the things which has caused dissension is landowners contracting to have windfarms installed well away from their own residences, but within sight and sound of neighbours.

It is understandable that landholders should wish to supplement their incomes by lease payments for wind turbines on their properties but this should only be secondary to more important considerations. We owned a 324 Ha property near Adaminaby and as it was suitable, we offered it to a previous government as a site for a nuclear power station, but the responsible ministry did not return our calls.

While there is no one solution to the provision of sufficient renewable energy to make a significant impact on the output of thermal stations, efforts and money should be put into those which provide the best returns. Of solutions which can be applied country wide in

manageable installations, direct conversion of sunlight to electricity via voltaic cells is the best. Such installations are much less obtrusive, make no noise and do not require sophisticated mechanical machinery to produce electricity. Also, although one cannot be certain of operation on particular days, one can be certain that there will be no production at night when it is not wanted. While alternative sources of renewable energy are discussed in Appendix 3, it is pointed out that plastering photo voltaic cells over house roofs is a most inefficient way of utilizing this resource. Where the capital costs are high, then efficiency is important and in order to achieve this, solar arrays must track and remain at right angles to the sun, just as wind turbines track and remain at right-angles to the wind. Solar arrays must track the sun horizontally and vertically, horizontally continuously throughout the day, while weekly steps vertically would be sufficient. This is also discussed in detail in Appendix 3.

It is noted that the efficiency of conversion of photo voltaic cells has been increased from 14% to 24% over recent years by a research team of professional engineers at the University of N.S.W. and there is obviously scope for further efficiency increases.

Appendix 1. Integrated, Thermally Based Electricity Supply System

Although this inquiry is confined narrowly to the socio-economic impact of windfarms, it is necessary to ascertain the useful contribution they can make to an integrated power system relying on coal-fired power for base load. Fresh investigation also needs to address whether there are not better ways of reducing the output of coal fired power stations while at the same time maintaining the integrity of the system and the ability to supply the daily peak demand.

Thermal power stations, whatever the heat source, which operate steam turbines, are thermally inefficient. This is not a function of the heat source nor of othe boilers but of the steam cycle. It requires 9 units of heat to transform unit mass of water into steam at the same temperature and that heat is lost when the steam is condensed. Thermal efficiency has been improved from about 35% to 39% by interstage reheating of the steam.

A thermal power station takes about 6 hours to bring up to load from cold. Again this is not because of the furnaces nor of the boilers which can be brought up to pressure quickly (the Stanley steam car of 100 years ago could be started in about 3 minutes) but is dependent on the steam turbine. If hot steam is fed in quantity into a cold steam turbine which could be 10 m. long, the rotor heats and expands much more quickly than the casing which results in the rotor fouling the stator with disastrous results.

Thus steam turbines required for the morning peak must be kept running all night at part load which is very inefficient. If the output is reduced too much, the furnace could go out and might re-ignite explosively. In the case of brown coal generators in Victoria, if the load drops below about 50%, fuel oil must be fed into the furnaces to ensure that they remain alight.

In order to maintain output as high as possible, off-peak power was made available at a cheap rate and even under the technically chaotic National Electricity Market (NEM) off-peak power at night is available for a little more than 1/3 the cost of daytime power.

Wind turbines do not fit into this scenario as unlike water, wind cannot be stored and used to produce power at peak times. In fact, if wind turbines operate a night, they are a nuisance.

While power cannot be stored directly, it can be effectively stored in pumped storage facilities which have an overall turn-around efficiency of 80%. However, while SMA/SMEC have designed and installed a number of such facilities and have designed others, any projects involving storage and use of water are automatically squashed, acts of unbelievable stupidity.

Apppendix 2. Formation and Role of SMEC in Renewable Energy Research and Implementation

As construction of the Snowy Mountains Scheme drew to a close, efforts were made to seek other nation building projects so that the greatest team of professional engineers ever assembled anywhere in the world from all around the world should not be dissipated. To this end SMEC was formed in 1970 as a Commonwealth Government owned engineering consultancy.

However, in the late 1960's external projects, both in Australia and overseas, were being undertaken

The SMEC charter provided that work in Australia could only be undertaken at the request of a government body, therefore most SMEC activities were directed overseas. It was realized that SMEC would need to diversify and hence I and others undertook courses in nuclear power engineering and natural gas transmission and distribution. Since SMEC was sold to the staff, it has grown more than 10 fold, but 80% of its work is still overseas. I have personally found this most rewarding as professional engineers are much more highly regarded overseas than in Australia.

Shortly after SMEC was formed, the OPEC instigated the first oil fuel crisis and there was a flurry of investigations into alternative fuels. Also every nutcase in the country decided to invent new wind or water turbines, some of which involved perpetual motion. As I had majored in aerodynamics as well as in fluid mechanics, I frequently got the job of investigating these inventions. In order to discredit them, it was necessary to develop a thorough understanding of the power and energy available in the medium being investigated and the efficiency with which it could be utilised. Wind power has been used for at least 3,000 years, initially for ship propulsion, so that investigation and design have reached an advanced stage, future improvements will be marginal only and there will be no major break-throughs. Current wind turbines are masterpieces of aerodynamic, structural,mechanical, electrical and materials design, but are limited by the power and energy available in the wind. The same applies to water turbines which in their present form have been under development for a couple of hundred years. Snowy Hydro have utilised the incremental gains in efficiency and output and these are set out in Appendix 3.

It is noted that a wind turbine of 100 m diameter produces 2.2 MW, whereas a Murray 1 power station water turbine of 1.8 m diameter produces 100 MW.

Appendix 3. Energy Efficiency

Where an overall reduction in energy use is one of the goals, then reducing losses and increasing the efficiency of usage is of great importance. Both State and Federal Governments' attempts to do this have been poorly targeted, woefully executed and have resulted in financial disasters.

In the early 1970's during the first oil fuel crisis SMEC was invited to assist in the design of the Sydney North Head waste water treatment plant. Already installed was an underground screening plant and pumping station. The raw effluent was to be pumped to surface treatment works and the treated effluent then returned to the sea. One of the first things we noted was a 5 MW gas turbine standby generating set with a tank full of kerosene fuel, while 20 m away was a flare pipe flaring off excess methane night and day. The staff asked how best to dissipate the energy in the treated effluent being returned to the sea and we proposed fitting energy recovery turbines to the shafts of the pumps. This would have reduced the electrical power input to the pumps by 70% and having just completed Tumut 3 power station where 3 of the 250 MW turbines have 200 MW pumps on the same shafts, we would have found implementation simple. Sydney water staff all ran and hid under their desks at such a heretical proposal and for all I know or care are still hiding there. Subsequently, of course, under Bob Carr's guidance 4 more pumps were installed at North Head to pump Sydney rain water run-off out to sea. There it is mixed with salt water and pumped back to an enormously expensive power and energy intensive desalination plant.

Also in the 1970's SMEC designed and implemented the Shoalhaven Scheme with 2 pumped storage plants and a pumping plant, all in tandem, designed to pump water from the Shoalhaven River to Wingecarribee Reservoir and thence down the Wingecarribee River to Warragamba Reservoir. Completion of the Scheme required the construction of a large reservoir on the Shoalhaven River at Welcome Reef upstream from the Tallawa intake pond. In the event the great Bob Carr cancelled the Welcome Reef dam and rendered the Scheme completely useless in drought times. The desalination plant can overcome this by working a bit harder with the input of more electrical power.

One of the more useful ways in which energy could be saved is in the design of household reverse cycle air conditioners. Currently these use air as the heat exchange medium and where air temperatures are extreme, the efficiency is low. It would not be difficult, but of course more expensive, to use a water radiator heat exchange system or in extremely high or low temperatures, embed the heat exchangers below ground. This is done in alpine regions and for air conditioners in hot regions, although in hot dry areas evaporative air conditioners are very energy efficient.

Another proposal is to make better use of assets we already have. Over the 25 year construction period of the Snowy Scheme, turbine peak efficiencies increased from 89% at Guthega to 93.5% at Tumut 3 power stations. At a recent Snowy Hydro presentation

to "Old Hands", we were advised that turbine runners in all the power stations had been replaced with runners of increased output, partly by increased efficency to 95% and partly by increased flow through the turbines. This increased the capacity of the Scheme from about 3,300 MW to more than 4,000 MW. The cost was $200,000 per increased MW compared with about $1 million dollars per MW for wind turbine installations.

These matters must, of course, be considered in the context that expressions including dams, hydro-electric and nuclear power stations, water storages and Professional Engineers, can only be used by adults or with parental guidance. Hopefully this idiotic attitude will change after the recent floods.

Appendix 4. Case Histories – Hydro-Electric and Tidal Power

Case 1.

From 1984 to 1987 I was Manager of SMEC's Malaysian office overseeing inter alia the implementation of two major hydro-electric schemes. A third one was being designed and has since been completed and 3 more are under construction or design. During my time in office SMEC input to the projects was being partially funded by Aus. Aid.

At that time the Gordon below Franklin Hydro scheme in Tasmania was under construction. Bob Hawke gathered his slum dwelling rent-a-rabble and together with his expert advisers (Bob Brown and ') headed off to Tasmania, stormed the ramparts and shut the project down. He then instructed the Tasmanians to recommission the Bell Bay oil fired power station, moth balled at the time of the 1970's oil fuel crisis, change it to coal-fired and dig a coal mine nearby. Astonishing even then, mind boggling now.

During his reign Bob Hawke also shut down the nuclear power engineering course at UNSW, abolished the Australian Atomic Energy Commission and formed a new group, ANSTO, with instructions to the staff to concentrate only on non-power research at Lucas Heights. He obviously did not want to spoil Australia's international reputation as a giant quarry and a farm and that is certainly intact.

Case 2.

In 1963 professional engineer John Lewis identified 300,000 MW of potential tidal power between Broome and Darwin. A number of proposals to harness some of this power have been put forward but for various reasons have been put in the too hard basket.

However, in about 2000 a consortium of engineers and contractors with appropriate expertise was put together with John Lewis as chairman, and devised a scheme at Derby with an installed capacity of 40 MW. This scheme included a transmission system connecting Derby, Broome and Fitzroy Crossing with potential to supply other smaller settlements in the region. It was a clever dual basin scheme whereby adjacent tidal basins separated by a peninsular would be closed off with gated barrages and a channel dug through the peninsular to join the two tidal basins. 4 bulb turbine generators, each of 10 MW capacity were to be installed in the channel. The gates of the upstream barrage were to be manipulated to maintain the level in that basin as high as possible and the gates controlling the downstream basin were to be manipulated to maintain the level in that basin as low as possible.

With this scheme the turbines would operate continuously and would supply the predicted demand except for 2 days per month during neap tides when some back-up

would be required. This was proposed to be provided by retaining some existing diesel engine capacity at one of the 3 centres.

The consortium applied for $60 million seed capital from the reserve maintained by the Federal Government for renewable energy projects and administered through the Greenhouse office. A team of accountants was appointed to investigate the scheme and someone thought they had better tack on a couple of engineers and an environmentalist, all three being provided by SMEC. I was one.

The scheme was investigated and it was recommended that the seed capital be provided. However, the W.A. State Government refused to allow the scheme to proceed and instead replaced the diesel installations with gas turbines with no interconnecting transmission lines. They tried, but failed, to get their hands on the $60 million dollars for their own political purposes.

As there is no pipeline to the region, the gas fuel is presumably carted up by diesel trucks. The consortium has been disbanded and the project abandoned. Friends and colleagues no longer wonder why I am cynical.

Appendix 5. The Blind leading the Blind

This is a classic example of a senior technologically illiterate bureaucrat employing equally technologically illiterate consultants at taxpayers' vast expense to produce populist nonsense. No doubt the statistics produced are provided by the vested interests who peddle these machines.

I suggest readers gaze at the 67 wind turbines across Lake George and imagine 1,500 of them. Refer also to the cover picture.

Study shows wind farms way forward for NSW

Just one new wind farm in the Cooma-Monaro Precinct could produce enough electricity to power 65,200 homes a year, according to a new online tool and energy market study launched by the Department of Environment, Climate Change and Water.

DECCW Director General, Lisa Corbyn, said the study by energy market analysts McLennan, Maganasik & Associates (now SKM MMA) has calculated the greenhouse gas savings from NSW wind farms in each of the state's six Renewable Energy Precincts, New England Tablelands, Upper Hunter, Central Tablelands, NSW/ACT border region, Cooma-Monaro and South Coast precincts.

Using data from the study, a new online tool will allow local communities and industry to easily calculate the projected greenhouse gas savings from new wind farms in different Precincts across NSW.

"The NSW Wind Farm Greenhouse Gas Savings Tool shows that a new 150MW wind farm in the Cooma-Monaro Precinct operating from 2011 will:

- Save 4.2 million tonnes of greenhouse gas emissions by 2020.
- Generate 476 gigawatt hours (GWh) of electricity annually.
- Produce enough electricity to power 65,200 homes annually."

Ms Corbyn said.

"Wind farms produce clean energy, they have the potential to be a large-scale supplier of energy in NSW and they can bring jobs and income to regional areas."

"By supporting research we can provide the information necessary to encourage industry investment and community support."

The study showed that output of wind farms in NSW 'almost exclusively' displaces output from NSW coal and gas plants, and Queensland and Victorian coal plants.

By establishing a standard methodology, the NSW Wind Farm Greenhouse Gas Savings Tool will make it easier for industry to do planning applications and the community can have confidence in the greenhouse gas savings.

There are around 20 wind farms with a combined capacity of around 3000 megawatts currently approved or under planning assessment in NSW – which would on average provide enough electricity to power over 1 million homes and save 7.8 million tonnes of greenhouse gas emissions a year.

In the Cooma-Monaro Precinct there are 300MW of wind projects approved for development.

Ernst & Young, in their assessment of how all States are positioned on renewable energy, described NSW as the 'next frontier' for renewable energy – highlighting NSW has good quality wind sites, and an electricity grid that can accommodate substantial growth in wind energy.

Ms Corbyn said NSW was fully committed to fostering investment in renewable energy technology to help it meet its State Plan target of 20 per cent renewable energy by 2020.

To see the Renewable Energy Precinct Resources web page and download the study Estimating Greenhouse Gas Abatement from Wind Farms in NSW and use the NSW Wind farm greenhouse gas savings tool go to:. http://www.environment.nsw.gov.au/climateChange/re-precinctresources.htm

Appendix 6. Letters Relevant to Windpower and Alternatives

This is a collection of letters relevant to windpower and alternatives over the period from August 2005 to December 2010. There was a change of my address in April 2008.

1. Letter to Snowy River Shire Council 16/08/2005
2. Letter to Cooma Monaro Express 03/01/2006
3. Letter to Cooma Monaro Express 27/02/2006
4. Letter to Cooma Monaro Express/Monaro Post 21/11/2010
5. Letter to Australian Newspaper, Canberra Times, Cooma Monaro Express, Monaro Post 13/12/2010

16th August 2005

The General Manager,
Snowy River Shire Council,

Dear Sir,

I write to comment on the proposed windfarm in the Shire. Modern wind turbines are magnificent machines at the forefront of structural, aerodynamic, materials, mechanical and electrical engineering technology. However, while they make the best possible use currently of windpower, their usefulness is plagued by the fickleness and very low power and energy content in the wind.

In recent years units have been increasing in size and sophistication so that machines of 2 MW capacity are currently on offer. These machines are huge with rotors approaching 100 m in diameter, mounted on towers about 80 m high. They are mighty machines to deliver a miniscule 2 MW and then only when the windspeed is sufficient. There is much populous nonsense written about how many thousand houses can be powered by particular windfarms but usually no mention is made of the unreliability of windpower. In fact, the capacity factor is usually in the order of 30% to 35%, i.e., the percentage of time during which the windfarm can produce its rated output. This output is random and as windfarms have no storage capacity for either fuel or electricity, they must be connected to a secure electrical grid. The output cannot be targeted towards specific demand, such as peak loads, but provides what is known as "opportunity" power/energy. The power is fed into the grid as and when the wind dictates. This might be in the middle of the night when it is virtually useless.

The power or energy flux in the wind per square metre perpendicular to the wind direction is equal to the density of air multiplied by the wind velocity cubed, divided by 2. However, after passing through a turbine, there must remain enough residual power/energy in the wind to move the air away from the discharge side of the turbine. The maximum theoretical aerodynamic efficiency of a wind turbine is about 60%. As a result of other aerodynamic and mechanical losses, the practical peak efficiency of a propellor type turbine is about 45%. Assuming a capacity factor of 35%, a turbine rated at 2 MW would be expected to produce about 6,000 MW hours energy per year albeit at unpredictable times. By comparison, if the vandalism of the Snowy Scheme is carried to its ultimate conclusion, and hopefully it never will be, then about 520,000 MW hours of clean green energy will be wasted per year. This would require about 87 of these monsters to replace the lost energy, but even they would not be nearly as effective, because Snowy power output can generally be produced when it is most useful.

It should also be noted that peak daily demand in New South Wales alone can reach 10,000 MW. Therefore none of the renewable energy options currently being considered can make an effective contribution. In fact, the only reliable large scale alternative to fossil fired power is nuclear power and this realisation is gaining ground around the world.

There will, I am sure, be other objections to a windfarm, involving visual and noise pollution, but I do not consider these to be over-whelming. However, I do question the cost effectiveness of windpower, particularly in view of the random and unpredictable timing of the output. I note that Snowy Hydro has investigated the possibility of investing in windpower but has rejected the proposal as not being viable.

Yours faithfully

N.B. Carter

Noel Carter

From: " Noel Carter"
To: "Cooma Monaro Express"
Sent: Tuesday, January 03, 2006 8:55 AM
Subject: Alternative Energy Sources

Dear Editor,

What are the alternatives? (Express 22/12/05) A good question as yet unanswered. The article purporting to provide the answer is as haphazard as the output from a windfarm and the authors suffer from a common complaint called "selective statistics". While Australians may produce the most noxious gas emissions (nge's) per capita, more importantly Australia as a whole produces 1.5% of global nge's.

The article produces masses of figures showing the miniscule contribution of windpower to total demand in various locations and then proclaims that windpower is the way forward. South Australia is proposing to produce 9% of its energy requirements using windpower by 2008. Hallelujah! What about the other 91%? Denmark, the undisputed windpower capital of the world and from whence most wind turbines emanate, produces 21% or just over 1/5th of energy requirements. Where do the other 4/5ths come from? As most European electricity systems are interconnected, perhaps they buy it in from other sources where it is largely produced by thermal power stations, either fossil fuel or nuclear.

The efficiency of the conventional propellor wind turbine cannot reach 50% - 45% is the limit. I doubt that solar power systems cost 3 times as much as wind turbines, but they do have one advantage in that they convert solar energy directly to electrical output without the intervention of machinery or thermal cycles. A professor of engineering and his research team in Australia have increased the conversion efficiency of silicon cells from 14% to 24% and in conjunction with industry are working on ways of reducing costs.

However, one can argue at length about the merits of the large number of renewable energy projects being investigated and the fringe benefits which they may provide and which will vary with location and application. The emphasis is on fringe benefits because with daily peak demand in N.S.W. alone approaching and frequently reaching 10,000 Megawatts, the impact of renewable energy resources at present and for the foreseeable future is marginal indeed.

One of many problems with the thermal power stations which provide the bulk of our power requirements is that because they take several hours to bring up to full power from cold, enough plant must be kept running at part load through the night to pick up the morning peak and this power is available cheaply. The low cost of off peak water heating reflects this. Wind turbines operating at night would be an embarrassment.

With the confidence born of profound ignorance, the authors proceed to denigrate nuclear power stations with the same old well-worn cliches. After the Chernobyl accident, which resulted from criminal negligence in the design of the containment system, the burgeoning nuclear power industry was put on hold by most countries, except France. The realisation is gradually sinking in throughout the world that for large scale electricity generation, the only practical and pollution free alternative is nuclear power stations.

By contrast, the meltdown at the 3-Mile Island nuclear power station in the U.S.A. was a triumph for the containment system, as virtually no radio-active emissions were detected. Nuclear power stations, because of their massive, heavily re-enforced containment systems, cannot be damaged by terrorists, only by military attacks. Terrorists to date have concentrated on "soft" targets maiming innocent civilians.

In 1968/69 Australia had planned to build a nuclear power station on Commonwealth land at Jervis Bay, together with a uranium enrichment facility. This was under the auspices of the Australian Atomic Energy Commission (AAEC), and a number of professional engineers, including me, from the S.M.A. and other government utilities, undertook an intensive post-graduate nuclear power engineering course. This course was offered by the University of New South Wales in conjunction with the Lucas Heights nuclear facility. In the event State politics caused the demise of the project which was disappointing for those of us who had worked and studied intensively to become proficient in this field.

Subsequently the Hawke government in a mini-Mao (or should that be Mickey-Mao) type of cultural revolution axed both the AAEC and the nuclear power engineering course and replaced the AAEC with Australian Nuclear Science and Technology Organisation (ANSTO), the only function of which is the operation of and research associated with the Lucas Heights reactor. In the atomic energy field Australia has thus been put back into the first half of the 20th Century.

The reactor in a nuclear power station is just a source of heat and the power is produced by steam turbines as in fossil fired power stations. Readers may be interested in some selective statistics, as follows:

. In 2001 there were 435 nuclear power stations operating in the world producing 16% of total electricity generation.

. The 54 nuclear power stations in Japan save as much noxious gas emissions as the whole of Australia's output
and their power stations operate on uranium imported from Australia.

. Denmark has the most expensive power in Europe.

The following statement by Dr Patrick Moore, one of the founders of Greenpeace in 1971, and subsequently its President, is enlightening:-

"Activists have abandoned science in favour of sensationalism - nuclear energy is the only non greenhouse gas
emitting power source that can effectively replace fossil fuels and satisfy global demand."

A windfarm is a loathsome thing, God wot,
Upon our pristine landscape it's a blot,
It's noisy, so it's mostly wind and hiss,
A thing if you don't have, you'll never miss.

N.B.

Carter

Note for Snowman: We recently visited a Specialist in Sydney. Our appointment was for 9.30 a.m. and at exactly that time we were ushered in to his surgery. His first words were - "I must apologise for being on time. I won't let it happen again.

Noel Carter

From: " Noel Carter"
To: "Cooma Monaro Express"
[redacted]
Sent: Monday, February 27, 2006 7:44 PM
Subject: Wind Energy

Dear Editor,

Once again we are subjected to a diatribe of technical nonsense (Case for Wind Energy, Cooma Monaro Express 23/02/06) from a resident of Jindabyne. The general thrust of the article is that wind power can be the sole answer to the production of electric power. The author quotes Dr. Diesendorf, sadly a typical academic scientist living in an impractical dream world and who probably could not exist outside the rarefied atmosphere of academia. By contrast his father was a highly skilled professional engineer who contributed greatly to the design and implementation of the Snowy Scheme. To put the argument in perspective and to carry it to its impractical extreme:- in order to provide peak demand of 10,000 MW with some degree of reliability, it would require 15,000 wind turbines, each with a capacity of 2 MW and capacity factor of 33%, and then with the fond hope that the wind would blow at the appropriate speed over 1/3 of the turbines during peak demand periods.

Referring now to the numbered benefits of wind energy. Harmful side effects, depending on location, can be noise and visual pollution. The technology is proven and reliable, the wind is not. It is not efficient and not economic.

However, wind turbines could make a significant contribution if appropriately located. The best locations would be along the peaks and ridges of the Great Dividing Range from Northern New South Wales down into Victoria and including the Flinders Ranges in South Australia. In addition, it should be mandatory to mount a wind turbine on top of every tall building or structure in our cities, including the peaks of the Opera House sails and the top of the Harbour Bridge in Sydney. The flag above Parliament House in Canberra would, of course, be replaced by a wind turbine. In that case extra power could be generated by a vertical axis turbine mounted in a chimney using the hot air chimney effect to generate air velocity. In our district and in parts of Victoria the visual delights of these machines on the peaks would enhance those already provided by the hundreds of ski-lift towers and cables already there. In the cities, any noise produced from wind turbines would be drowned out by the howls of protest from the denizens of those social and environmental cesspools.

With respect to so-called greenhouse gas emissions Jindabyne residentsshould look carefully in their own backyard and realise that for every 1% of Snowy River flow, in addition to the 54% already flowing in from rivers and creeks below Jindabyne Dam, including the 1% release from the Dam, five million kg a year of GHG's are produced from our coal-fired power stations to replace the power and energy lost to the turbines of the Snowy Scheme.

Finally, with reference to the ignorant nonsense concerning nuclear power stations, I am writing to the Prime Minister to suggest that he use the leverage provided by Australia having 40% of the World's known uranium deposits and being a suitable repository for nuclear waste, to insist that those wishing to use these facilities, should provide us with nuclear power stations in return. I will also offer our property at Dry Plain as a suitable location for a nuclear power station, with the proviso that we are allowed to live in our home alongside the facility for as long as we wish. I have a post graduate diploma in nuclear power engineering and have no more fear of danger from them than do the hundreds of operators of the existing 450 nuclear power stations in the World, nor of the even greater number of service personnel working in close proximity to the nuclear power plants of numerous warships and submarines.

Noel Carter

From: "Noel Carter" <[redacted]>
To: [redacted]
Sent: Sunday, November 21, 2010 6:36 PM
Subject: Fw: Water down the Snowy River.

----- Original Message -----
From: Noel Carter
To: Cooma Monaro Express ; Monaro Post
[redacted]
Sent: Sunday, November 21, 2010 3:48 PM
Subject: Water down the Snowy River.

What a wonderful sight to see those great curtains of water from the cone valves at Jindabyne dam. it is so much more fun to dissipate power and energy into the air than to put the water through boring hydroelectric turbines. It was exhiliarating for the clever scientists who discovered that Snowy Hydro has been denying water to micro organisms in the Snowy River for more than 40 years to be able to paddle in the river and see the results at first hand. How magnanimous of the govt. to pay Snowy Hydro not to produce hydro-electricity. This may seem innovative but is just a variation on a British theme where they pay farmers not to produce food. In any case smart city bureaucrats have deduced that only power produced by hydro turbines installed since 1997 is clean and green so the water might as well be sent down the river.
We have heard yet again this time from the Victorian Minister for Water that the only water flowing down the Snowy River is that released from Jindabyne dam, 1% of flow for 40 years. How could we silly old engineers who designed the scheme have got it so wrong? We concluded by measuring stream flows and correlating with rainfall patterns that 53% of flow comes in downstream from Jindabyne dam via the McLaughlin, Bombala, Delegate, Pinch and many other rivers and streams in the more than 300 kms. between Jindabyne dam and the sea. Of course we didn't have computers in those days and so we had no access to google-earth and nor were the truths by Al. Gore available.
The old fashioned ideas we had that you built dams to store water when it was plentiful, for use when it wasn't, have been superseded by the modern theories of Bob Carr and Bob Brown and they have certanly given us our full 2 bobs worth.(Peter Garret is a worthy successor to Bob Carr). The modern theory is that you let the water out to sea, or in the case of Bob Carr install extra pumps at North Head to hasten rainwater run-off from Sydney on its way, mix it with salt water and then pump it back to complex and expensive desalination plants. The pumps and the plants use a lot of electricity but that will be provided by wind turbines and solar panels, which unlike pre 1997 hydro turbines, do produce clean green power. Until those are completed we will just increase the output from coal fired power stations. In Sydney the desalination plant cost only twice as much as the whole Snowy scheme but it does supply nearly as much water as the leakage and wastage from the ancient and decrepit distribution pipework in Sydney. Melbourne has gone one better with a desalination plant that will cost 6 times that of the Snowy Scheme but it hasn't been built yet so they are saving a lot of electricity in the meantime.
This modern logic is far beyond the comprehension of Professional Engineers so governments are now employing teams of accountants, lawyers and market analysts to implement the projects. Overseas countries have not yet caught up with these trends so consulting engineering companies like SMEC are growing exponentially and calling back retired staff to cope with the demand.
Where will it all end? Why should I care? After 60 years here apart from lengthy periods overseas, I conclude that Australia is a great place to live if you don't take it too seriously!

Noel Carter

From: "Noel Carter"
To: "Canberra Times"
"Monaro Post"
Sent: Monday, December 13, 2010 12:45 PM
Subject: Fw: Water

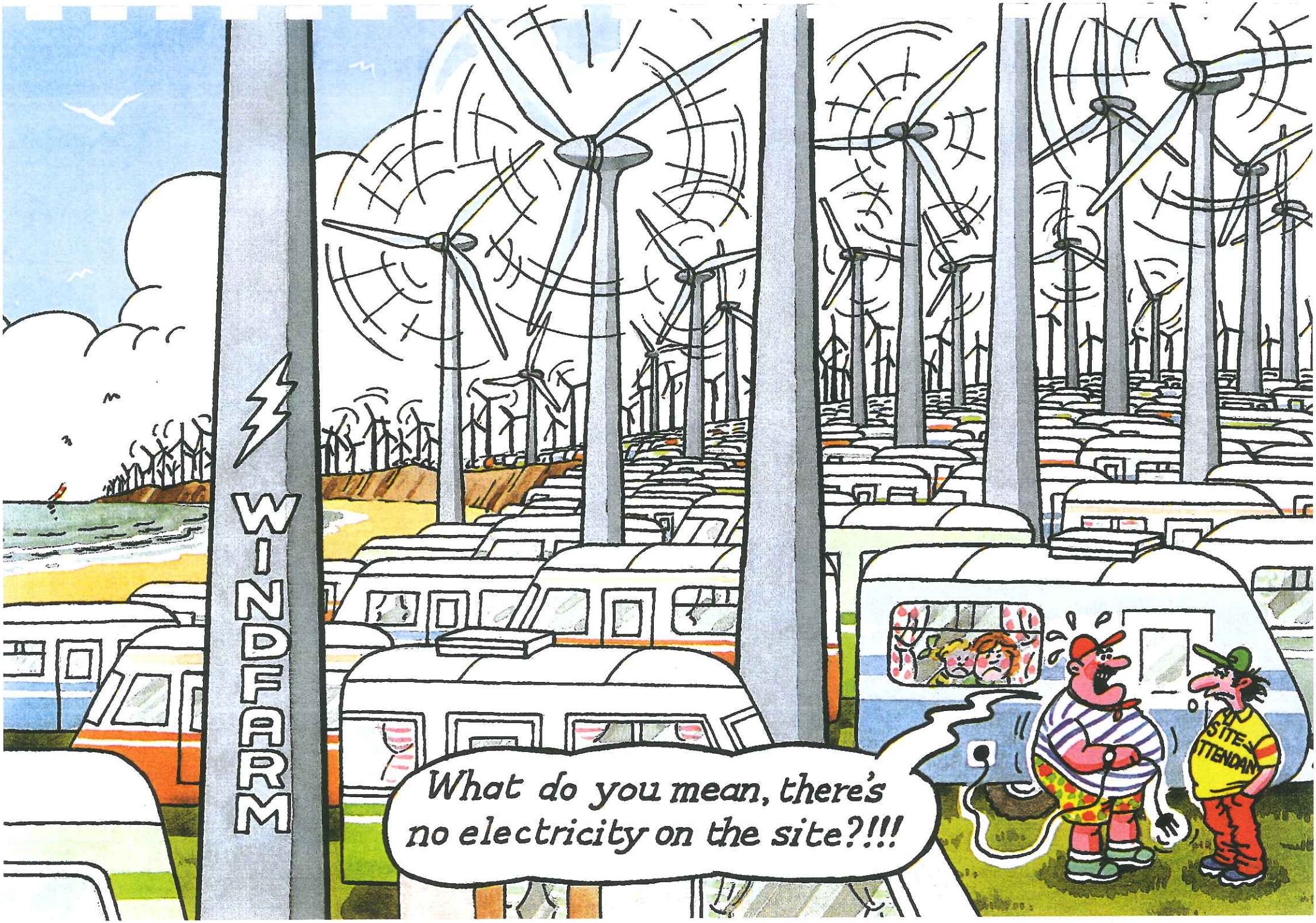
----- Original Message -----
From: Noel Carter
To: Australian Newspaper
Sent: Monday, December 13, 2010 12:39 PM
Subject: Water

Isn't it wonderful? Nearly every river in the Eastern states is undergoing massive floods, nearly every dam is spilling and inland town and country people are manning the lifeboats or together with their livestock are heading for the hills. In the midst of this 50 of our brightest and wettest professorial scientists abandon their computers and airconditioned offices, sally forth into the wilderness and demand that the government release more water down the rivers. Halleluja! Are their compatriots from universities in Dubbo and Wagga Wagga preaching this gospel from boats in the streets? Will the government be recalled over Christmas to pass emergency enabling legislation? I wait with bated breath.
Most of the spilling dams contain hydroelectric power stations which will be operating night and day at full capacity. When I wonder is the "Australian" going to tell us how many homes are being powered by these turbines and how many thousands of tons of CO2 are being saved? But let us pause, under the complicated and illogical rules devised by some semi illiterate city bureaucrats most of the electricity produced will not qualify for clean green status. This is no doubt based on the fact that the water passing through the turbines is a bit muddy and this will surely affect the cleanness and greanness of the electricity produced.
I do hope that regional citizens will appreciate the efforts of these great scientists as they gather around their sodden Christmas trees.

Appendix 7. Postcard from Wales

A little nonsense, now and then,
Is relished by the wisest men.

I am encouraged by the fact that Rowen Atkinson (Mr. Bean) has a Doctorate in Engineering Science from Oxford University.


WINDFARM
What do you mean, there's no electricity on the site?!!!
SITE ATTENDAN

Noel Carter APPENDIX 8.

From: "Jim
To: "'Noel Carter'" <
Sent: Tuesday, November 30, 2010 5:20 PM
Subject: FW: Senate Community Affairs References Committee inquiry into the Social and Economic Impact of Windfarms - Invitation to make a Submission

Dear Noel,
Enjoyed your latest instalment to the Express, particularly about the storm water being mixed with sea water and then desalinated. Sounds *very* much like a government run operation!!
Forwarding the following and if you can respond the more the better.
Lots of rain on the Monaro and still raining.
Regards,
Jim

From: "Community Affairs, Committee (SEN)" <Community.Affairs.Sen@aph.gov.au>
Date: 29 November 2010 2:06:48 PM
To: <info@aign.net.au>
Subject: Senate Community Affairs References Committee inquiry into the Social and Economic Impact of Windfarms - Invitation to make a Submission

AUSTRALIAN SENATE
COMMUNITY AFFAIRS REFERENCES COMMITTEE

PO Box 6100
PARLIAMENT HOUSE
CANBERRA ACT 2600
Tel: (02) 6277 3515
Fax: (02) 6277 5829
Email: community.affairs.sen@aph.gov.au
Website: www.aph.gov.au/senate_ca

29 November 2010
Mr Michael Hitchens
Chief Executive Officer
Australian Industry Greenhouse Network
PO Box 4622
Kingston ACT 2604
info@aign.net.au
Dear Mr Hitchens

Inquiry into the Social and Economic Impact of Rural Wind Farms

On 27 October 2010 the Senate referred the following matter to the Community Affairs References Committee for inquiry and report by 30 April 2011:

> The social and economic impacts of rural wind farms, and in particular:
>
> (a) Any adverse health effects for people living in close proximity to wind farms;
>
> (b) Concerns over the excessive noise and vibrations emitted by wind farms, which are in close proximity to people's homes;

(c) The impact of rural wind farms on property values, employment opportunities and farm income;

(d) The interface between Commonwealth, state and local planning laws as they pertain to wind farms; and

(e) Any other relevant matters.

The Committee invites you to provide a submission addressing issues that may be of relevance to you. The submission should be lodged by 10 February 2011.

The Committee prefers to receive submissions in **electronic form submitted online** or sent by email tocommunity.affairs.sen@aph.gov.au as an attached Adobe PDF or MS Word format document. The email must include full postal address and contact details.

Submissions become Committee documents and are made public only after a decision by the Committee. Publication of submissions includes loading them onto the internet and their being available to other interested parties including the media. Persons making submissions must not release them without the approval of the Committee. Submissions are covered by parliamentary privilege but the unauthorised release of them is not protected. Information relating to Senate Committee inquiries, including notes to assist in the preparation of submissions for a Committee, can be located on the Internet athttp://www.aph.gov.au/senate/Committee/wit_sub/index.htm.
Please also be advised that the Community Affairs References Committee has been provided with advice from the Clerk of the Senate on the matter of parliamentary privilege for potential submitters and witnesses who have signed confidentiality agreements with wind farm operators. This advice can be found athttp://www.aph.gov.au/Senate/committee/clac_ctte/impact_rural_wind_farms/Clerks_Advice_161110.pdf.
Should you require further information please contact the Committee Secretariat on 02 6277 3515.
Enquiries from hearing and speech impaired people should be directed to Parliament House TTY number 02 6277 7799. Adobe also provides tools at http://access.adobe.com/ for the blind and visually impaired to access PDF documents. If you require any special arrangements to enable you to participate in the Committee's inquiry, please contact the Secretariat.
Yours sincerely

Naomi Bleeser
Committee Secretary