

**The Committee Secretary  
House of Representatives Standing Committee on Industry and Resources  
PO Box 6021  
Parliament House  
CANBERRA ACT 2600**

**Submission to inquiry into renewable energy in Australia**

**Patrick G. Quilty AM**

My starting philosophy on this topic springs from a belief that I should arrive in, and depart from, this world leaving the smallest environmental footprint that I can. I contravene this philosophy by driving a car, flying, using energy domestically etc.. I have three children and four grandchildren, one 18 months old. It is possible that he will be living early in the 22<sup>nd</sup> century and may have his own grandchildren so that I can see some 200 years ahead and want to ensure that my descendants have an opportunity to live a more environmentally sustainable lifestyle than I do. I am also a geologist by profession and have the past to look back to.

While others will address issues such as the safety or otherwise of nuclear power, I concentrate solely on the renewable, sustainable issue.

To allow individuals to live in accord with my philosophy, the world has to move away from the use of carbon-based (coal/hydrocarbons) fuels as an energy source. We have been living in something of a fool's paradise in which we pay only the cost of exploration, extraction, transport, company profit margin and a government tax/levy/excise. Cheapness is the aim without taking into account other costs. We pay nothing yet for the removal from the environment of the products of combustion of this apparently cheap resource. If we were to include the cost of removal of the waste products from the atmosphere, the cost of our energy would be much greater and identified alternative energy sources would be competitive.

The world uses energy at approximately  $1/10\ 000$  ( $10^{-4}$ ) of the rate at which the sun provides energy *to the earth's surface*. This emphasis is important to differentiate that energy readily available from that arriving at the top of the atmosphere and trapped within the atmosphere. It is my contention that Australia is in a unique position to take advantage of its natural resource of sun's heat.

**Solar energy**

*EOS*, the newsletter of the American Geophysical Union (vol. 87. no. 43, 24 October 2006; attached figure), had an authoritative article entitled 'Where are the hottest spots on earth?'. The data were obtained from several years of satellite data-gathering. The figures plotted are for the temperature at the earth's surface and thus different from that obtained by meteorological institutions which measure the temperature at a standard elevation above ground level and thus lower than shown on the map.

The startling feature of the distribution of global temperature is that the distribution is not very uniform and two regions stand out. One is across northern Africa, through

the Arabian Peninsula to India. The other is Australia where a temperature of 69.3°C was recorded in Queensland in 2003. There are subsidiary spots (not as extensive nor as hot) in south-western Africa, south-western North and South America and central Asia.

A consequence of the data is that Australia, with 0.3% of the earth's population, 1% of its energy usage, and 4.5% of its land surface area has an immense advantage over any other comparable area on earth in relation to capturing sun's heat as an energy source. All of our energy needs could be supplied from this source, if we have the will to address the issue.

Another statistic that appeared at approximately the same time as the *EOS* article was contained in *The Diplomat*, a journal on issues of foreign affairs and trade. It referred to China's commitment of US\$180 billion for research into alternative energy sources over the next 15 years.

Australia needs to be seriously into alternative energy resources before the rest of world runs ahead of us. We have a great natural advantage but we seem reluctant to take advantage of that.

A secondary advantage of our heat source is that it is widespread over the country and not highly localised as are coal and hydrocarbons. This will allow us to site collecting stations at a variety of places dictated by considerations other than those of simple access to the resource. The long-term environmental footprint of such facilities is minor.

### **Geothermal energy**

Australia does not have much in the way of geyser fields such as New Zealand, Italy and the United States have, but we do have good sources of geothermal energy that can be utilised in other ways. This technology seems to be developing and it is pleasing to see that several companies are active in the field. It is a case in which society is active in pursuing this approach and it will be successful in finding heat sources and producing energy. The big question is whether it can compete economically with other sources. That is yet to be seen.

### **Other sources**

One consideration for the future is that energy sources are going to be more diverse, complex, and often local. There are several other, more local sources that will need to be considered in the totality of energy sources. Already, tidal power is widely used even if it is only a small part of the total generated. Parts of Australia are in excellent position to take advantage of this source and would have been by now if the full cost of hydrocarbon use was taken into account.

Experiments are being conducted into various forms of utilisation of wave energy. Some of these will work and be useful but others are better able to comment on these than I am.

### **Conclusion**

Australia is one of the most gifted regions on earth in terms of potentially renewable, sustainable, and essentially pollution-free, energy from diverse sources. We can set an

example to the rest of the world while also developing the technology and leading the world in that technology, in turn allowing us to both gain economically and to give aid where needed.

As a consequence of Australia's natural advantages in this context, I see no need for us to consider the use of nuclear power for our own energy. If nuclear fusion were to evolve, I would be happy to see that considered but that is far in the future.

If we take advantage of our natural energy sources, we will continue to refine the technology of collecting that resource both in absolute terms but also in efficiency. If we can get to lead the world in this technology, we can export it to areas of the world such as north Africa where a considerable portion of the earth's under-privileged live (or die).

My plea is that Australia should get into commercial scale experiments in solar energy collection and distribution with the object of being commercial with consequent benefits for this country but also for other parts of the world.

It seems that there is a reluctance to commit to particular Greenhouse emission reduction targets but if the U.S. had followed this approach, it may still not have landed anyone on the moon and brought them back safely. A commitment was made, and with the right will, the aim was achieved.

I emphasise that I am not Green in the emotional sense but have my feet firmly on the ground, and have been an active scientist for over 45 years (brief CV attached).

Patrick G. Quilty AM  
Honorary Research Professor  
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#### **References**

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Mildrexler, D.J., Zhao, M. & Running, S.W. 2006. Where are the hottest spots on earth? *EOS* v. 87, no. 43, 461.

The Diplomat, December 2006/January 2007 edition, p. 28. Source: World Watch Institute.

**Professor Patrick Quilty** was ANARE Chief Scientist with the Australian Antarctic Division of the Department of the Environment and Heritage, and is now Honorary Research Professor in Earth Sciences at the University of Tasmania and recently Distinguished Visiting Professor at California State University. He is a geologist, with B.Sc. (Hons.) from the University of Western Australia and PhD from the University of Tasmania. He has worked in academia at the University of Tasmania and at Macquarie University, in industry with West Australian Petroleum (WAPET). He participated in both Deep Sea Drilling Project (Leg 34 East Pacific, 1973/74), Ocean Drilling Program (Leg 120, Indian Ocean, 1988; Leg 188, Prydz Bay, Antarctica, 2000) and several other marine geology cruises.

He chaired the organising committees for XXth meeting of the Scientific Committee on Antarctic Research (SCAR) in 1988, the Vestfold Hills and Macquarie Island Symposia, and has been on state and federal councils of ANZAAS. In 2004 convened the 17<sup>th</sup> Australian Geological Convention in Hobart, and was, until recently, Federal Secretary of the Geological Society of Australia. He is on several committees in a variety of fields.

He was senior vice-president Royal Society of Tasmania (Governor was president), president of the Association of Australasian Palaeontologists, and was vice-president of SCAR for a four year term. He has published over 190 scientific papers. He has five species, a range of nunataks and a bay named in his honour.

He received the US Antarctic Services Medal (1974), was Distinguished Lecturer (1986) for the Petroleum Exploration Society of Australia, Royal Society of Tasmania Medal (1996). He was invited speaker in the North American Speaker Series (organised by the Education Office of the Australian Embassy in Washington) for 1998/99. He is now a patron of the University of Western Australia Geoscience Foundation.

In 1997 he was awarded Membership of the Order of Australia (AM) in the Queen's Birthday Honours List and was made inaugural Distinguished Alumnus from the University of Tasmania.

He first visited Antarctica in 1965/66 with the University of Wisconsin and has made 14 other working trips south in addition to accompanying 19 tourist overflights and five tourist ship voyages.

He is a regular commentator on radio and has done a TV documentary. He is used widely as an occasional speaker and member of committees.

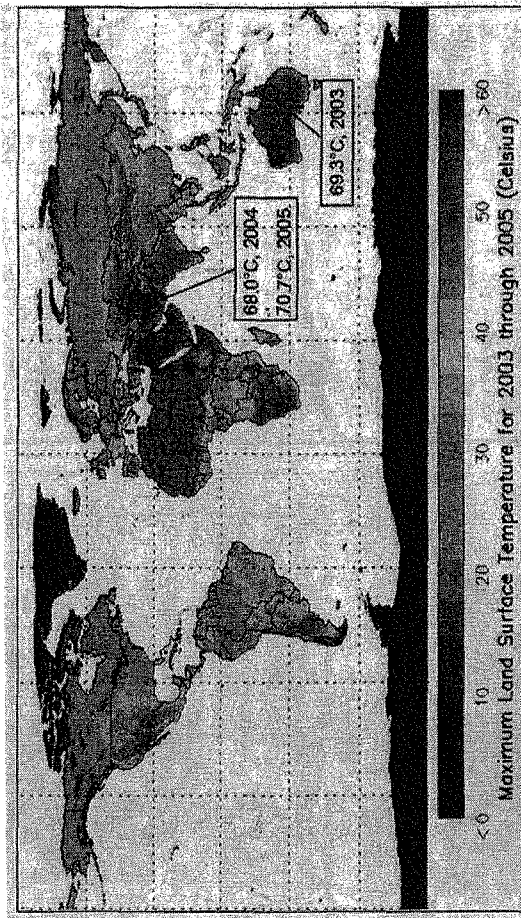


Fig. 1. The average of the hottest annual maximum land surface temperatures (LSTs) at each pixel over a three-year period illustrate that the hottest places on Earth are barren landscapes, such as the deserts of Iran and Australia, which were the hottest places on Earth from 2003 to 2005. Global, automated maps of annual maximum LST based on highly calibrated, geolocated, satellite data with continuous spatial coverage from the Aqua/MODIS sensor allow for easy monitoring of variability and trends in maximum LST.