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The Secretary
Senate Rural and Regional Affairs and Transport
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INQUIRY INTO AUSTRALIA'S FUTURE OIL SUPPLY AND ALTERNATIVE TRANSPORT FUELS

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1 Projections of Oil Production

- a) Depending on which camp one comes from, oil production will peak this decade if the 'early toppers' are correct, or between 2020 and 2030 if the 'late toppers' are correct. Those in the 'early toppers' include geologists, some bankers, a few world governments and many analysts working for the UN. 'Late toppers' include oil companies, economists and most financial analysts.

In the 2005 US Hirsch Report, the authors stated that peak production would occur no later than 2016.

Doubt as to Reserves

- a) In 2004 the former Chairman of Shell, Sir Philip Watts, told investors that Shell had overestimated its reserves by 20%. Shell's replacement Chairman, Jeroen van der Veer, later told a press club in Nov 2004, he suspected there would be further scandals being hidden in other companies because of over estimation of reserves.
- b) Many Middle Eastern producers refuse to release figures of their reserves but we do know Saudi Arabia's big four wells are on the decline. Water now has to be pumped down to push oil up in its biggest well.

- c) The peak of oil discovery was 1965 (Exxon Mobil).
- d) Chevron noted that 33 of the 48 oil producing nations are in decline.
- e) There have been no big discoveries since 1975.
- f) All recent discoveries are small; most are expensive and have only a few years' production life.

Jereon van der Veer also stated that the geologists know where to look, have done so over and over again, and no discoveries of any significance have happened.

Conclusion

Whether peak production is in this decade or as late as 2030 is not the point. As the USA's Hirsch Report stated, a 20 year period of mitigation is needed prior to peak production if the US economy is not to collapse. As Australia is still moving towards road transport for goods and people, Australians should heed the same warnings immediately.

Certainly Japan and many European countries are quickly preparing as if peak oil will occur this decade. Eg, by 2010, Sweden intends to have petrol-driven cars off roads and be petroleum-free by 2020.

In April, 2005, the French investment Bank, Ixis-CIB warned 'crude oil prices could touch \$380 a barrel by 2015'. That equates to \$7 - \$7.50 a litre at Australian pumps by today's standards.

By that time Australia's oil-based economy would have collapsed.

2 Alternative Fuels

The answer to the problems in the short term is not alternative burning fuels such as coal or gas. Neither are hydrogen or bio fuels.

A) Bio fuels

- i) With climate change, ever increasing el Ninos and increased droughts, it is certain we won't be able to assure a steady supply of bio fuels.
- ii) With travel as usual, it is not even possible to produce enough crops except to add a small percentage to our supply. One US analyst stated that every square inch of USA would need to be cropped for its present fuel needs.
- iii) Whether bio fuels could be supplied or not, the major percentage of road transport will still come from oil which would still mean extremely high

petrol prices. By all means, bio fuels should be used as a bandaid but it is not the solution.

A British report from 2005 showed that the energy expended in growing transporting and producing bio fuel made this an inefficient and costly method of producing energy.

B) Hydrogen

Hydrogen may be a fuel of the future and should be considered only in that light. Unfortunately, electricity to produce hydrogen presently would come from coal-fired power stations causing more damage to the atmosphere. In future, some hydrogen could be produced for special needs from Solar energy and the ocean's energy especially from North and North-West Australian coastline. That could happen if Australia began now to develop the technology. Never-the-less, it takes more energy to produce hydrogen than the energy you get from it.

C) Shale / Sand Oil

Conventional oil has had a rate of energy return on energy invested of about 30 to 1. Oil sands rate of return is about 1.5 to 1. This is almost a prohibitive investment unless it is sold for extremely high prices.

Conclusion

No matter whether we use alternatives or not, transport costs will soar in the near future.

3 Technical Developments

Immediately governments should be investing heavily in:

- a) increased public transport and rail freight
- b) renewable energy, especially in solar and ocean energy technology. Once again, Europe and Japan lead the way. With just 60% sunshine reliability, Japan now leads the world with solar development. Australia has ample space and over 90% sunshine reliability. There is already solar and ocean technology ready if the political will was present. As well, much renewable technology is waiting to be developed if given government assistance.
- c) Restricting the manufacture and sale of gas-guzzling private vehicles and taxing vehicles according to their weight as happens in many countries that have successfully reduced gas-guzzling vehicles.

Conclusion

A transport system run on renewable energy is not just the long-term solution but could save our economy in the short term.

All cities that have opted for an efficient electrified public transport system have saved money as well as improved the social, health and environmental climates of their cities.

4 Environmental Effects

That the world is on the brink of an oil crisis is no longer disputed. Even the most optimistic predictions suggest peak oil by 2030. According to the British Government's 2005 Report, the only long-range alternatives to oil by 2050 will be electricity and, hydrogen for special purposes.

The only present sources in Australia for these energies are from coal, nuclear and renewables to produce electricity and hydrogen. As stated earlier, bio fuel would only ever provide an extremely small percentage of energy and would be unreliable because of climatic conditions.

A) Coal

- i) There is a growing public opposition to coal-fired power stations. The NSW Government rejected the desalination plant partly because the NSW State Government planned a coal-fired power station to make it possible and the public of NSW were outraged.
- ii) Many more coal-fired power stations would be required to replace an oil-based economy. This would increase Australia's GHG emissions considerably. If geosequestration is ever found to work, even scientists working on that technology agree that it could take 20 years to have the technology ready for commercial use. Therefore, more coal-fired power stations would exacerbate global warming.
- iii) There is no doubt that the use of coal will be greatly reduced during this century. Global warming and finally the world's political will, will see to that. As solar technology advances, this will become the preferred method in metal smelters. France already has one solar powered smelter. Solar and wind power are the fastest growing sources of energy in the world. We therefore need an alternative for our biggest export, coal. Renewable energy technology will definitely help. Germany, which has the strictest energy policies, now holds the most number of sustainable technology patents.
- iv) Even small coal fired stations use approximately 120,000 Litres of water per day, 365 days of the year. Availability of water does not appear to have been taken into account regarding the future production of electricity from coal fired power stations, nor nuclear stations for that matter. This has to be considered in a drying continent.

B) Nuclear

- i) The nuclear industry, especially with mining of uranium, requires oil for transport. Huge amounts of water are also required.
- ii) Nuclear power could take more than 20 years to come on line. This would be because of public protests and then construction.
- iii) Although Australia has the largest reserves of uranium, if many countries decided to use nuclear power, the world's uranium resources would be used within 20 – 30 years.
- iv) The more nuclear power, the more dangerous it becomes. Leaks and other accidents would be more likely. The threat of terrorist attacks becomes more real.
- v) Despite the rhetoric of the uranium lobbyists, nuclear power has already been proven by energy companies in California and some other US states, to be more costly than renewable energy.
- vi) Nuclear power is a centralised system of power. This has inherent dangers of massive black outs.
- vii) Germany is phasing out nuclear power because of costs, perceived environmental dangers and dangers from terrorism. Sweden, which relies heavily on nuclear energy, has plans to scale back for 2 reasons: (a) cost (b) they see uranium becoming less available and more expensive.

C) Renewable Energy

i) Hydro

As New Zealand has discovered, climate changes have already cut water storage in the past five years which has resulted in energy cuts during summer months. Australia is becoming a drier continent which means water storage for hydro electricity will become less as time goes by.

ii) Ocean Energy

Almost all the coastline of north-western Australia is ideal for tidal power for production of hydrogen. One day, hydrogen will be the major source of the limited, non-electrical transport. Even so, the ratio of energy input to output for hydrogen will only allow its use for special purposes. Australia is in a position to produce hydrogen from a renewable source for national use and export.

iii) Electricity from hot rocks

Central Australia is ideal for power generation from hot rocks. Although this is being developed, it is still presently uncompetitive but only in the initial stages. There is the added disadvantage of being a centralised system of power production. It also has the drawback of requiring huge amounts of water for steam generation. Water storage would

be the biggest problem. Never-the-less, as changes occur, it may become more competitive and hot rocks are an endless supply of heat.

iv) Wind Power

- a) The biggest reason for some public backlash to the introduction of wind power has been lack of community consultation and lack of planning. With good planning there are many suitable areas in Australia with little population and reliable wind.
- b) Wind power is fast becoming competitive with other sources of energy and is far cheaper than nuclear energy.
Wind energy will have to become a necessary and important part of the mix of energies for future needs.

v) Solar Energy

- a) Practically every energy expert in the world has stated that the twentieth century was the fossil fuel century and the twenty-first century will be the solar century. With growing interest worldwide and Australia's lead in solar technology research, it would be inexcusable not to develop it.

In the 1940s, Australia led the world in computer technology research. We opted not to support it and the rest is history. For similar reasons, it would be suicidal to take the same approach with solar technology.

- b) Solar energy is expensive to install but from there on the costs reduce making it even cheaper than coal when economic, health and environmental costs have been included.
- d) Contrary to rhetoric, "what happens when the sun isn't shining" is no longer an argument. Throughout the world, there are already means where excess solar electricity can be converted to store energy. Some examples: i) Pumping water during sunshine hours from low holding dams to higher ones so that hydro-electricity is produced when needed. ii) heating of oils and other substances that can later be used for steam production. iii) more efficient batteries (and development of even more efficient ones) for small scale energy storage.
- e) Solar can be used in an integrated and distributed system where as, coal and nuclear power cannot.
- f) Most solar power stations would be situated west of the Great Dividing Range in a distributive system. Those stations would increase employment opportunities in rural areas that are presently dying.
- g) Solar stations can be built on a needs basis thereby saving wasted electricity unlike coal and nuclear stations having to run on peak production at all times.

- h) If, or as, energy needs increase in any area, additions can easily be made instead of having to build a new station which has to be done with coal and nuclear power.
- i) The old argument that solar stations take up too much space is a fallacy. Many Australian physicists have shown that an area less than the size of Sydney would supply all Australia's present electricity needs.
- j) As stated earlier, Australia has over 90% sunshine reliability as compared to the 60% reliability for countries which have already invested in solar energy. Solar efficiency in Australia cannot be compared to Japanese and European solar energy costs yet opponents still do.
- k) Practically every year we see Australian researchers improving efficiency of solar cells. The *Solar Systems* group has improved efficiency from an initial 12% to 38% and see further efficiency increases.
 - i) Because of wild storms in 2003, fifty million homes were blacked out in northern USA and Canada. This is just one example of the drawbacks of a centralised system. Distributive systems cause far less damage.

Conclusion:

In the end, environmental issues will dominate debate in Australian and world politics. As people suffer more and more from the effects of global warming and become more educated about nuclear power, there will be an ever increasing public demand for clean, renewable energy.

Australia can either chose the present cheap and dirty option or invest in renewables and export those technologies.

5 ECONOMIC EFFECTS

- a) The biggest danger to the Australia economy and, indeed, the world, is the lack of preparedness for oil depletion and rising oil prices. Reiterating what was stated in the USA's Hirsch report, "a twenty year period of preparedness is required." We may not have that much time, which means we must immediately begin to utilise alternatives to oil and that means using technology that is already available, i.e. renewables
- b) There is no doubt that without serious action now, Australia will face an economic depression that will make the Great Depression look like a walk in the park. This depression will hit long before the predicted oil prices of \$380 a barrel by 2016.

- c) USA and Australia are the two countries most reliant on oil to drive their economies. Lack of public and rail transport puts Australia in a very serious situation in the near future and one from which we may never recover.
- d) Australian jobs are continually being moved overseas. Real unemployment facts are hidden because of increased part time work. A renewable energy industry employs four to seven times the number of workers working in the mining and coal - electricity industry. Improvements to Australia's public transport and rail systems would help alleviate job losses in petroleum related industries.
- e) Further more, little is said about the effects on the health of our nation from car-polluted cities and coal and uranium mining. What is known shows that they have a major effect on people living in those areas. Results from overseas shows that investment in renewables has cost less than initially thought. Indeed, as time progresses after the introduction of renewables and increased public transport, there have been savings from the following: less road construction and maintenance, better health, an improved environment and increased sales of new technology.

GENERAL CONCLUSION

Regarding the looming oil crisis, it is evident Australia has the following choices:

- 1 Business as usual which will surely plunge our nation into a depression within the next ten years.
- 2 Rely heavily on coal and perhaps nuclear energy for most of the nation's stationary and mobile energy. Let alone other factors, world events and changing world attitudes to those sources of dirty energy will also make that a poor option.
- 3 Immediately impose regulations, e.g. a carbon tax that will force people to conserve energy as well as raising money to invest in improved mass transport and to fund research and development of renewable energy. It is a fallacy that Australians will not move out of their cars. In 2005 when oil was over \$70.00 a barrel, there was a mass exodus of people from their cars to use public transport.
- 4 Unlike nuclear stations and carbon sequestration preparedness, technology for renewables already exists but there is no encouragement for their use by the federal and the three eastern state governments.

The economy, environment and health of our nation could well rest on the results of this senate enquiry.

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