



**NUCLEAR POWER**  
**23 September 2009**

**Mrs PENFOLD (Flinders) (15:33):** The time has come when nuclear power and the Australian people are ready to go forward to provide plentiful clean energy and water for Australia and the world. My observations appear to be supported by a recent *Advertiser* poll in which 79 per cent of respondents agreed that nuclear power was the way to go in the future. Certainly, according to *Independent Weekly* reports, the Rudd government is using taxpayer funds to find out how to make nuclear a more acceptable power source.

South Australia has copious quantities of uranium and even more thorium available to build fourth generation large nuclear reactors that could provide Australia with clean power and burn up existing nuclear waste from Australia and overseas. A recent ABC science report drew my attention to the advances in nuclear technology and prompted me once again to draw attention to the need for our state to be part of nuclear solutions for power, water and waste.

Instead of exporting uranium, taking the money and washing our hands of any responsibility for technology, South Australia can and should lead the world in nuclear research and development of fourth generation reactors. Until now, it would have been difficult to bring the Australian public with any government attempts to move in this direction. However, despite the Premier's public opposition to a nuclear plant in South Australia, the very fact that his government has scrapped the two mine policy, approved the Four Mile mine, and the Honeymoon mine is coming into production, clearly shows that we have moved on from past thinking.

While replacing Port Augusta Power Station and putting a reactor there could be seen as the obvious site, I would like to see the first reactor built in the Maralinga prohibited area and used in part to further clean it up. Some of the profits could go back to the displaced local Aboriginal people and also people and their families who were involved in, or affected by, the experiments without knowledge of possible future consequences and not protected from known consequences. These people have had the pain and should reap the gains of using uranium.

Maralinga has a number of advantages, as it is on the railway line that connects Australia north, south, east and west and can be connected to the port at Fowlers Bay. There is also a long, heavy duty airstrip available on-site. Uranium and nuclear waste can easily and safely be brought in from around Australia and overseas and processed, and the power can be connected into Australia's grid. A power transmission DC line across the Nullarbor would make our grid a truly national one, linking east to west.

Old technology reactors leave unburnt more than 99 per cent of the uranium fuel, wasting most of the potential energy and leaving a large quantity of long-lived waste that requires storage in safe remote repositories for thousands of years. However, in his article '4<sup>th</sup> generation nuclear power', Dr James Hansen stated:

There are two compelling alternatives to address these issues, both of which will be needed in the future. The first is to build reactors that keep the neutrons 'fast' during the fission reactions. These fast reactors can completely burn the uranium. Moreover, they can burn existing long-lived nuclear waste, producing a small volume of waste with a half-life of only several decades, thus largely solving the nuclear waste problem.

I reiterate that the benefits of fourth generation power plant—the uranium—can be completely burnt and assist with the nuclear waste problem, all at a massively reduced cost. Further, Dr Hansen states:

The other compelling alternative is to use thorium as the fuel in thermal reactors. Thorium can be used in ways that practically eliminate buildup of long-lived nuclear waste.

Dr Hansen identifies in his article the Integral Fast Reactor which has been built and tested in Idaho National Laboratory, stating that 'many enhanced safety features are included and have been tested, such as the ability to shutdown safely under even severe accident scenarios'. He also identifies the Liquid-Fluoride Thorium Reactor that that 'uses a chemically-stable fluoride salt for the medium in which nuclear reactions take place', going on to say:

Both the Integral Fast Reactor and the Liquid-Fluoride Thorium Reactor operate at low pressure, which alleviates much of the accident risk, and high temperatures enabling more of the reactor heat to be converted to electricity, unlike today's Light Water Reactors. Both also have the potential to be air cooled and use waste heat for desalinating water.

Being able to provide all the power and water we need to facilitate the mining industry in the north and west of South Australia, plus cleaning up the existing nuclear waste problem while reducing CO<sub>2</sub> production may seem too good to be true, but I believe it is true.  
**Time Expired.**

(Rest of Speech not given due to time constraints.)

The only thing that will prevent it happening is the desire for plutonium for military uses, and the uranium industry not wanting to see an end to the massive expansion of the industry that would be curtailed by very little new uranium being needed to power the fourth generation reactors, and the political will to overcome these difficulties.

I would argue that the world will be a better place without plutonium and it will be a long time before the new technology takes over. There are lots of old technology reactors that will need uranium for many years to come. We should be involved in the research and development required to enable Australia to build fourth generation nuclear reactors, thus helping to lead the way to abundant and affordable power and water for the world.

### **Solar energy backed by G-G ALGA News May 23, 2008**

Governor-General Major General Michael Jeffrey has stepped into the energy debate, saying solar power is Australia's best prospect of securing a large-scale clean and sustainable energy source.

Speaking at a Future Summit in Sydney, he suggested water, food and the environment would be among Australia's top issues in 50 years time, and that all three were linked to plentiful and reasonably priced energy.

Major General Jeffrey also told the summit that thorium - a naturally occurring and slightly radioactive metal - should be explored as a nuclear fuel alternative, as well as the potential to extract oil from shale deposits in central Queensland.

But he says improving solar technology is a priority. "The Australian scientists suggest that they could meet the total energy needs of Australia with a solar panel array of around 50 kilometres squared," he said. "How to store and then distribute that energy remains the technical problem requiring rapid resolution."

**Major General Jeffrey says the use of thorium as a nuclear fuel alternative could prove to be an important means of securing Australia's future energy supply**

### **Nuclear Waste 14 November 2007**

**Mrs PENFOLD (Flinders):** Since 3 May 2006, when I spoke of hearing Mr Wilson da Silver on the ABC *Science Show*, I have mentioned in this house the need to take the mineral thorium seriously to help us to take back the nuclear waste safely, particularly plutonium, created from the sale of our uranium. I believe that we are morally obliged to take back these wastes to ensure a safer world, as currently, our uranium, after use, can easily find its way to less stable countries where it could be used to devastate us and the people of the world far more efficiently than climate change ever will.

On 7 March 2007, I recommended the article 'New Age Nuclear' by Tim Dean in the April 2006 issue No. 8 of *Cosmos* magazine. I heard almost nothing about thorium since then until, to my amazement, I opened *The Advertiser Review* of Saturday 3 November 2007 to page 2 under 'Can You Believe It?' with Professor Stephen Lincoln, entitled 'Uranium alternative: A safer, more plentiful nuclear fuel is in our backyard'. In a box headed 'The "other" nuclear fuel' three points were made as follows:

- There is three times more known thorium than uranium. A quarter of these reserves are in Australia.
- Thorium cannot sustain a nuclear chain reaction alone, making it a safer fuel and reducing its usefulness as a weapon.
- The radioactive waste produced by thorium has a shorter life span than normal uranium fuels.

I am delighted that Professor Lincoln is a professor of chemistry at our very own University of Adelaide and I note that he is the author of *Challenged Earth* which I have yet to find time to read. However, I want to quote his article, which was buried on page 2 of the Review, in order to draw it to the attention of a broader audience than it probably found there in the hope that the government (both state and federal) will invest in thorium research. Hopefully, they might reconsider taking back our nuclear waste and help replace nuclear power stations around the world with thorium ones. The article stated:

Is this too good to be true? A fuel that offers to reduce climate-change gases and consume dangerous weapons-grade plutonium and uranium? Uranium has a new competitor: the dense silvery metal thorium-232. Named after Thor, the Norse god of thunder, the slightly radioactive thorium-232 is three times as plentiful as uranium. Australia has 300,000 tonnes of it in the form of monazite sands, a quarter of world's known deposits. Thorium-232 is not a nuclear fuel. However, it is very close to being one. Thorium-232, when hit by a neutron, can change into uranium-233, which is a nuclear fuel similar to the uranium-235 used in nuclear reactors now...

When uranium-233 is 'burnt', a neutron strikes a uranium-233 nucleus which splits into lighter nuclei—otherwise known as fission products—and more neutrons. These 'loose' neutrons then go on to strike another uranium-233 nucleus, forming what is known as a 'chain reaction'. As the nucleus breaks apart, it generates heat which may be used to produce high-pressure steam to drive electricity turbines.

However, when the thorium-232-produced uranium-233 is split by a neutron, it does not produce enough extra neutrons to sustain the energy-producing chain reaction. It needs an extra 'injection' of neutrons. This is where weapons-grade nuclear materials come into the picture. Since the nuclear weapons non-proliferation treaty of 1968, the dismantling of nuclear warheads has made redundant hundreds of tonnes of highly enriched weapons-grade uranium-235 and plutonium-239. These explosives must be stored safely to avoid accident and theft. Thorium-232 reactors offer a path to transform these metals into less dangerous materials.

Fuel rods containing mainly thorium-232 can be 'primed' with a smaller amount of either uranium-235 or plutonium-239. This provides the neutrons to transform the more stable thorium-232. These primed thorium-232 rods have another, commercially attractive advantage: they can be used in existing conventional nuclear reactors. Without the weapons-grade plutonium-239 and uranium-235, with thorium-232 reactors will need another source of neutrons. This can be produced by electrically driven linear accelerators. These shoot a 'beam' of neutrons into the thorium-232 to keep it 'burning'. These accelerators can be switched off, stopping the thorium-232 reaction immediately. Because there is three times more thorium than known uranium deposits, it promises a longer-lasting source of non renewable energy. And 'burnt' thorium-232 produces less long-lived radioactive waste than its counterpart.

Time expired.

**Uranium/Thorium (Address in Reply)**  
**3<sup>rd</sup> May 2006**

**Mrs PENFOLD (Flinders):** I congratulate our gracious Governor on the wonderful job that she does for the people of our state. She is an inspiration to us all with her hard work and dedication to her job. I particularly appreciate her visits out to the country regions of the state where her visits are a highlight. I thank the people in my electorate for the ongoing support for the Liberal team, and I note that the Labor Party reduced its vote in my electorate by 3.3 per cent. I also thank those people who helped out during the election in any way, and I welcome our new members to this parliament.

The lease of ETSA by the former Liberal government helped to pay off about \$6 billion of the previous Labor government's \$9 billion debt, and has enabled the state to regain a AAA credit rating by Standard and Poor's in 2004. Together with the GST funding from the federal Liberal government, and high and increased state taxes, the present Labor government has a unique opportunity to begin building, upgrading and replacing the infrastructure that our state so desperately needs if we are ever to take our place, where I believe we should be, as a natural hub between east and west.

The lifeblood of South Australia is the 96 per cent of businesses that are classified as small. These businesses will never alone be able to pay for the upgrade of infrastructure that is needed if they are to remain viable and to expand, particularly in the regions where infrastructure is so often either old or non-existent. The user-pays policy and the excuse that it is the job of private enterprise are not excuses the government can hide behind. Already Adelaide is bursting at the seams with urban sprawl while the remainder of the state is under-utilised because of lack of infrastructure.

The government is the biggest business in the state and must take responsibility for ensuring that the whole of its asset—our state—is utilised properly. The income from regions has helped to pay for the city infrastructure and now the city must invest in country infrastructure to fulfil the exciting development potential of the whole of the state. Partnerships with private enterprise must be formed and, as suggested by Business SA, could be coordinated by an independent planning body to jointly tackle this massive infrastructure problem. The first two principles under Business SA's *A Blueprint for South Australia's Future*, under the heading of infrastructure, state:

The relationship between physical infrastructure and economic development is critical to community prosperity.

and:

Physical infrastructure is a key element contributing to economic development, not a consequence of it.

Both these principles seem to have been lost on current and past Labor governments, as is the fact that people are happiest and healthiest when they have worthwhile employment and that most employment is provided by people who have taken the risks and responsibilities of being self-employed and employers.

The state needs road, rail, air, sea, power and water infrastructure if it is to provide the economic boost and the jobs that would see our own children returning and others coming from across Australia and around the world. The previous government invested, if you could call it that, in projects such as 333 Collins Street in Melbourne, which did not even leave the benefit within our state. These investments brought our state to its knees, with the State Bank collapse.

So far, the current Labor government has shown no better business sense, providing nothing but gimmicks, creating no long-term jobs and very little benefit for the general population. Clear examples include expensive imported trams at \$55 million and proposed extended tramlines; retrofitting solar panels to government buildings that already have less expensive power; tanks for government buildings that already have less expensive water; a proposed opening bridge for an extra \$100 million; and in my electorate providing a miserable 1.4 gigalitres of water piped from an already over-exploited River Murray at a cost of \$48.5 million to Eyre Peninsula when private desalination is available at a lower cost per kilolitre. Also to be considered are a series of tenders for infrastructure that are cutting out local tenderers and favouring interstate and overseas tenderers.

From small businesses large businesses grow. They employ more local people, take up larger buildings and pay more state taxes, but they have to be given a chance. Eventually, once again, a Liberal government will be brought in to clean up the Labor mess. If the funds that have already been wasted on gimmicks had been put into supplying real infrastructure where businesses are without adequate power, water, transport to expand and employ, we would have seen significant growth in employment and exports, when the opposite is the case. For example, the 40-year old single

132 kilovolt powerline that services the whole of Eyre Peninsula, a region as big as Tasmania, could have been duplicated along the west coast, providing security of power to this huge region and enabling 1 000 megawatts, about a billion dollars worth, of wind turbines to be built there, putting their power into the grid, reducing tonnes of greenhouse gases and creating hundreds of jobs in industries. This power could be used for desalination, mining and exports, particularly if combined with the graphite block energy storage technology. Instead, this state continues to import power.

The development of South Australia's minerals, particularly those in the Gawler Craton, which was recently recognised at the Prospectors and Developers Association of Canada, the largest trade fair in the world, as being of world-class significance, will be an important part of South Australia's economic future. However, infrastructure—power, water, roads and trained people—will be the key to their successful development. Of the minerals found in the Gawler Craton and the Curnamona Craton in South Australia, uranium can be expected to form a significant part. Australia holds about 30 per cent of the world's known uranium resources, and South Australia in particular has the potential to be the largest supplier of uranium in the world. One of the major mines in the world is at Olympic Dam (previously called a mirage in the desert by our Premier). Beverley is already a world class in situ leach mine, and Honeymoon is soon to begin mining with, hopefully, the support of the governments—state and federal. With the increase in commodities prices, companies are clamouring to get into South Australia. All the prospective land in the Gawler and Curnamona cratons has been taken up and the price for overseas companies wanting to participate has increased greatly.

South Australia will always find it difficult to compete with low cost, overseas countries in manufacturing. However, there are a number of exciting opportunities currently available that could really make a difference. The one that would have the most impact on our state, creating significant opportunities for business and jobs growth, is mining. Mining will create the wealth to pay for much needed infrastructure, while making South Australia a significant player in Australia and on the world scene.

As well as iron ore and other minerals, the government should facilitate the mining and safe use of our uranium. Many countries are expanding their economies rapidly and, without non-polluting alternatives, will contribute to the expansion of greenhouse gases and global warming on a massive scale with the expansion of coal and oil-fired power.

According to the Editor of *COSMOS*, Wilson da Silva, just mining coal kills 10 000 people per year worldwide and accounts for about 14 000 deaths from air pollution in the USA alone. There are better ways of using hydrocarbons, including safer, more efficient methods of combustion and safer work practices that would, of course, reduce these figures. However, uranium would still compare very favourably on health risks and produces few of the greenhouse gases.

Bruno Comby, the founder and president of Environmentalists for Nuclear Energy, in an article entitled 'The Nuclear Greenies', which appeared in *The Adelaide Review* on 15 April 2006, stated that burning of oil throws out into the atmosphere 23 billion tonnes of carbon dioxide every year (725 tonnes per second), which is seriously affecting the climate.

We have the uranium in the ground and the state Labor government is happy to dig it out and send it overseas. What continues to amaze me is that they take no responsibility for what happens to it, so long as it is not disposed of in South Australia. The Woomera nuclear dump that was put there without discussion by a former Labor federal government, would seem to me to be a good place to store waste until a safer and better method of disposal is found. At the very least, Woomera could be used to store waste, particularly the low-level waste from South Australia, if only because it is the responsible thing to do.

Government and independent assessment have shown that South Australia has some of the best geological terrain in the world suitable for the storage of nuclear waste. If we want the benefits of mining and utilising uranium, then we must take the responsibility. That is particularly the case when some of the countries where we may send it, or where it may end up, may not have stable governments, nor the funding or the will to store it responsibly.

Hannum, Marsh and Stanford in an article entitled 'Smarter Use of Nuclear Waste', published in the *Scientific American* of December 2005, state:

Several nations, including Brazil, China, Egypt, Finland, India, Japan, Pakistan, Russia, South Korea and Vietnam are building or planning nuclear plants.

We can now add Iran to that list. Perhaps returning waste to South Australia would overcome one of the strongest objections to the use of uranium, that the waste might be reprocessed to make nuclear weapons. Even Bob Hawke, the

Premier's mentor, could see the benefits—including economic—of taking back uranium waste for reprocessing and storage. The environmental hazard is a lot less than it could be if we do not take responsibility for it.

Technology to improve the use and disposal of uranium is exciting. For instance, Wilson da Silva spoke recently on the ABC *Science Show* of an accelerator-driven thorium system, generating nuclear power that could never blow up, adding:

. . . with a reactor that would never suffer a meltdown, produce no weapons-grade by-products, and even burn up old radioactive waste as part of the process. The *UIC Nuclear Issues Briefing Paper No. 67* of November 2004 states that thorium is a naturally occurring, slightly radioactive metal discovered in 1828 and found in small amounts in most rocks and soils 'that has found applications in light bulb elements, lantern mantles, arc-light lamps, welding electrodes and heat-resistant ceramics', with thorium oxide used in glass for 'high quality lenses for cameras and scientific instruments'.

Obviously, a relatively benign metal that can be used to provide power and, in so doing, dispose of radioactive waste without creating plutonium that could be used in weapons would be welcomed. However, Da Silva laments that there is no full-scale prototype yet in operation and that:

Despite the promise of thorium—and the fact that Australia has the world's largest reserves of thorium—there is only one scientist in the whole country involved in researching the technology—and he is funded by the Germans!

To work on a product that could supersede uranium and dispose of the wastes currently produced by nuclear power stations, while at the same time providing a high quality green power supply, would be a project worthy of a state that has the potential to supply the world with uranium. I feel quite sure that partnerships could be developed with the federal Liberal government and also with state and possibly overseas governments to build a trial plant and then, if proven, to build a full scale plant in South Australia—preferably accessible from north, south, east and west by rail. I feel sure that other states and countries would pay to safely dispose of their waste and we could benefit by using it in a thorium system. A feasibility study would soon indicate whether this proposal was possible.

Let us do something significant and, as our Premier so often tells us, be innovative. Let us start leading the world in this new, accelerator-driven thorium system and perhaps help the people of the world to significantly reduce their greenhouse gas emissions and help turn around global warming and environmental degradation before it is too late. We have nothing to lose and we, and the world, have much to gain.

South Australia already has large resources of uranium in the ground in various forms that have not hurt anyone. We could develop a properly managed, deep storage system with dedicated road/rail for waste and charge for storage. We could then put conditions on the user on how they generate waste and manage their power generation facilities.

Current known supplies of uranium will only last several decades. It will take many years for new technology to develop and for the subsequent power stations to be constructed. During this period very large quantities of waste will be generated. This waste should be seen as an immensely valuable resource, as only 1/100th of its potential energy is actually used. The balance could potentially be extracted—possibly using the accelerator-driven thorium system or the high temperature reprocessing and fast neutron reactors. Storage for decades and subsequent re-use would create great wealth for South Australia. Again, this is well into the future. It needs foresight, imagination and the squashing of some Labor members' anachronistic aversion to anything nuclear.

In the meantime I support renewables. South Australia, and in particular Eyre Peninsula, is ideally suited for this purpose. I understand that, on the day Australia signed up to supply China with possibly \$400 million worth of uranium, Hydro Tasmania signed up to supply about \$300 million in a wind power deal with China. Hydro Tasmania, Pacific Hydro, Babcock and Brown and Ausker Energy, among others, would spend more than \$1 billion on wind farms on Eyre Peninsula and much more in South Australia if the power could be put into the grid. Again, it is a matter of priorities, and this Labor government prefers wasting money on media attention and trivia rather than infrastructure that would really make a difference. All options for the generation of power need to be examined, including the renewables, fast neutron reactors and thorium. However, whatever we do, it remains that nuclear power generation is a significant means of reducing greenhouse gas emissions and will be used around the world, much of it using Australia's uranium. The last word on infrastructure goes to Business SA, which states in its blueprint:

Currently, each of these infrastructures is planned separately according to their different ownership structures and according to their individual business plans. While this situation is likely to continue, there is a clear financial case for coordinating planning to enable the sharing of installation costs. Government should form an Infrastructure Planning

Council that incorporates existing bodies, such as the Electricity Supply Industry Planning Council, into one group to coordinate the infrastructure planning needs of South Australia. The benefit of this approach is that it removes political considerations from infrastructure spending and allows the decision making process to occur in a bipartisan way.

Then we may see the 'community prosperity' alluded to by Business SA in its 'Blueprint for South Australia's Future' first principle that states the need for 'critical' infrastructure for this to be achieved. I support the motion.

### **Nuclear Waste 6 June 2002**

**Mrs PENFOLD (Flinders):** The subject of nuclear waste has been drenched with misinformation and politicised to the point of absurdity. The Labor Party, at both state and federal level, has been actively involved with the search for a national nuclear waste repository since at least 1986. The 1991 Labor state government of which Premier Mike Rann was a cabinet member was actively involved with the then Labor federal government in seeking a national nuclear waste repository. I quote from a letter written by Dr Don Hopgood, then state Deputy Premier, to Simon Crean, then federal Minister for Primary Industries and Energy. Dr Hopgood stated:

*South Australian government officials have participated from the outset in the collaborative development of proposals for national radioactive waste facilities through the Commonwealth-State Consultative Committee, and they took part in the desk study completed in 1986 to identify broad areas of Australia that are likely to contain sites satisfying the International Atomic Energy Agency's criteria for siting a low level radioactive waste repository.*

Labor's public opposition to a nuclear waste facility is simply grandstanding, using misinformation to generate fear in the community. Why were they willing to acknowledge acceptable selected sites in 1986 under a federal Labor government but in 2002, under a federal Liberal government, those same potential sites are suddenly taboo? Let us examine the fear that surrounds anything nuclear. Where does the fear come from?

When the nuclear industry was in its infancy in the 1930s it was hailed with positive excitement as a boon to humankind, principally due to the invention of X-rays for medical use. The Second World War was followed by the Cold War of the 1950s in which western free thinking was opposed by communist ideology. The threat of a nuclear war was used to gain public support for the development and maintenance of the defence industry and personnel. Propaganda played on fear, fear of another world war and of the destruction that such a war would bring. But fear is a powerful motivator, especially when it is allied with ignorance.

Leadership—that is, genuine positive leadership—means giving the public all the facts, not just those that suit a particular facet of an argument. The Labor government is not showing sound leadership in its handling of the nuclear waste debate. We are all subject to radioactivity all the time: it is part of the environment. Chernobyl was one of the earliest nuclear power generators. Technology has advanced since that time, as would be expected. It is rather like comparing the first vehicles with the cars being manufactured today. Even such a small thing as tyres changing from solid rubber to pneumatic can be overlooked in such a comparison.

The fear of radiation health effects, particularly from severe accidents and radioactive waste, is central to public concerns about the nuclear industry but, as mentioned before, radiation is a fact of everyday life. Radiation is a natural component of the air we breathe, of the earth we walk on, of the homes we live in, of the food we eat and of human tissue and bones. It will be a major step forward when we consider the nuclear industry in the same way as we look upon coal, gas, oil or chemicals. It is an industry where potential negatives must be ascertained and adequate safeguards put in place, as is done in other industries.

I doubt that anyone would propose that the chemical industry be abandoned, yet this has the potential to cause massive ill health, deaths and environmental disasters. The 1984 accident at a chemical plant at Bhopal in India caused some 3 000 early deaths and severely affected the health of several hundred thousand. The fossil fuel industry has likewise had some catastrophic accidents. A pipeline gas leak explosion in the Urals involved 500 fatalities, while the 1989 Exxon Valdez oil tanker accident in Alaska led to severe environmental damage.

The disposal of empty chemical drums and waste oil is a concern. However, the concern is met with commonsense so that acceptable, practical solutions are worked out. Let us treat the nuclear industry the same way. Let us look at

the environment for a few moments. We are all—or should be— concerned about global warming. That is brought about largely by the use of fossil fuels. Power generation is a considerable component of that use. If we are serious about reducing carbon dioxide emissions and the pollutant effects of the fossil fuels industry, then we would be examining nuclear power generation as an alternative option, along with wind and solar power generation. Forward thinking countries are already doing this. I quote from International Atomic Energy Agency (IAEA) figures from 1997, as follows:

*Globally, the nuclear share of electricity is more than 20 per cent in 19 countries. Regionally in 1996, western Europe, with a 33 per cent share, had the highest percentage of nuclear electricity—the nuclear share in France, Belgium and Sweden being 77, 57 and 52 per cent respectively. Two large plants in Lithuania supplied almost 85 per cent of the country's electricity requirements.*

*With a continuation of the current trend, the next century [which is the one we are now in] will see global electricity demand grow faster than overall energy demand as electricity provides the greatest flexibility in use at the point of consumption. Already, Turkey, an example of a rapidly industrialising developing country, has seen its electricity capacity increase tenfold in 25 years.*

It is plain commonsense to produce electricity using technology that has the least effect on the environment. That means a move away from the use of fossil fuels, a move that the oil industry will doubtless oppose strongly. It means an increasing use of nuclear generators, and that means, of course, that waste repositories will be needed. And they must be safe ones.

When this whole nuclear waste debate gained momentum a couple or so years ago, a then 17 year old supported the establishment of a waste repository in South Australia to take all grades of nuclear waste. His comment was that South Australia could charge for material deposited in such a facility, thus generating revenue for the state—revenue that could be used for health, education, roads, scientific research or any of the many other areas where the government never has enough funds to meet perceived needs. The suggestion is one that I support and one that I have heard regularly since from all age groups.

Port Lincoln resident and South Australian advocate for a nuclear waste dump, Terry Krieg, calls for public debate and education on nuclear waste disposal. He believes that there is massive community ignorance despite nuclear materials, including waste, having been handled safely since the late 1960s. He suggests that a waste repository could become a new and valuable industry for the state. He stated:

*I didn't create the problem but I'm prepared to help find a solution. We can help isolate the waste from the environment forever and it will be good for the earth and for the South Australian economy.*

However, the issues would need to be debated rationally and factually, rather than like the debates that now take place in a sea of misinformation, fear and hysteria. Much of the current debate gives the impression that nuclear waste is somehow to be avoided at all costs. Yet what we are talking about is waste—whether low, intermediate or high level— from the everyday use of nuclear technology. Some examples of short-lived intermediate level waste are exit signs, industrial smoke detectors and radium painted watch or instrument dials (the type that glows in the dark).

Smoke detectors are probably one of the most common everyday uses of nuclear technology. Many detectors contain a tiny amount of radioactive material, which makes the detector sensitive to smoke. These smoke detectors save lives. The eventual waste product has to go somewhere. I repeat: nuclear waste products have to go somewhere. The alternative is to reject any nuclear technology. Try to imagine a world without X-rays, radiology, soil testing, radiotherapy, scans, and the ability to track hidden courses as diverse as underground water or blood circulation in the body.

My own husband Geoff was so irradiated to kill cancer cells when our children were young that I was advised that our children should go to live with their grandparents, and so should I if I wanted any more children. Geoff recently turned 60 and is in good health, despite very high radiation, in fact, because of it.

I commend Port Lincoln Mayor Peter Davis on his stand supporting the establishment of a low level radioactive waste repository in South Australia and regret that it was not supported by the Port Lincoln city council. Mayor Davis observed:

*If we don't support a low level radioactive waste repository, then we shouldn't have smoke detectors, no glow in the*

*dark watches, no cancer treatments, no microwaves, no road surveying technology. It's about time we debated this issue rationally because we need to know what to do with all this stuff instead of storing it unsafely in cupboards in Adelaide.*

Mayor Davis, addressing the Local Government Association in Adelaide earlier this year, stated:

*Nuclear technology is not going to stop tomorrow so we need to find a sensible place to store the waste instead of it being stored in hospital cupboards. In fact, if the geologists and nuclear physicists say it would be in my backyard, then that's where it will be.*

I support a nuclear waste facility in whatever location is deemed safest and best. If that is South Australia, so be it. Also, let us look at charging other states if they want to make use of it. Of course, if the state Labor government misses the opportunity to set up a financial stream for the state and the facility is set up by the commonwealth, we will still have the facility with no ancillary financial benefit to the state. We will probably have to pay them.

Premier Mike Rann is very keen to fritter away the state's funds on a referendum. It has been estimated that such a referendum would cost about \$6.4 million for the Electoral Commission alone, without the educating process that is essential to enable people to make a choice. A good leader accepts responsibility, along with the power that accompanies leadership. It seems that Mr Rann wants the power without the responsibility. Being able to blame someone or something else—

**The Hon. M.J. ATKINSON:** I rise on a point of order, Mr Acting Speaker. From early in the member for Flinders' forthright contribution, she continues to refer to the Premier by his Christian name and surname, particularly by his surname. I ask you, Mr Acting Speaker, to draw to her attention the requirement to refer to the Premier by his office or his electorate.

**The ACTING SPEAKER (Mr Snelling):** The Attorney-General is always on the alert. I missed the references, and I ask the member for Flinders to refer to their members by their titles.

**Mrs PENFOLD:** My apologies, Mr Acting Speaker.

Mr Barry Wakelin, federal member for Grey, the federal electorate where a facility may be sited, recently stated in the local paper:

This nuclear waste is as a result of extremely useful purposes in many cases about saving human life.

He asked a number of questions of the Premier, including:

1. Where he will store his South Australian waste safely? Or will he continue to leave it in many places all over the state, as is currently the situation?
2. What does Simon Crean, the federal Labor leader, say after initiating the policy for a national repository in 1991 and then dumping waste in Woomera in 1994-95?
3. Will Mr Rann abolish the use of nuclear products—

**The Hon. M.J. Atkinson:** No, not again.

**Mrs PENFOLD:** No, this is a quote. I am allowed to do so in a quote, am I not?

**The Hon. M.J. Atkinson:** Okay, go ahead.

**Mrs PENFOLD:** Thank you. He asked:

3. Will Mr Rann abolish the use of nuclear products which save lives?

Let us bring sanity back into the nuclear debate. We have a nuclear industry; it is a part of our 21st century life. The industry will generate waste. Let us store that waste in the most appropriate geographical and politically safe location. If that is the north of South Australia, then let us support the decision with commonsense.