

ROTARY DISTRICT CONFERENCE - SOUTH AUSTRALIA  
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CLIMATE CHANGE / NUCLEAR POWER

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**CONTEXT FOR THE DISCUSSION**

At this time of the year, everyone has an opinion about football, politics and climate change!

The topics of global warming, climate change, and national energy strategies are a cocktail of issues worthy of the best efforts of all leaders of every sector and at every level of our society

- Demand for energy to double by 2050
- Use of coal will double by 2050
- GHG<sup>1</sup> emissions will double by 2050 if business as usual (but need to halve)
- From a small base, use of renewables will increase sharply
- Continuing dependence upon fossil fuels – need ‘clean coal’
- How to connect the dots from now until 2050 and beyond?

Australia has little difficulty in meeting demand growth – challenge is to do so in an environmentally responsible way.

**ENVIRONMENT; GLOBAL WARMING; CLIMATE CHANGE**

- Current debate confused between doing good for the environment, mitigating global warming, and adapting to climate change
- Environment
  - Self evidently, not polluting waterways, keeping beaches clean, using less toxic chemicals, noise abatement, recycling, conservation ... are all good. But none of these actions bear directly upon climate change except at the margin
- Global warming is the main game
  - GHG<sup>1</sup> emissions from burning of fossil fuels (coal, gas, oil); 5.5 billion tonnes of coal/year
  - Global phenomena – CO<sub>2</sub> residence time > 100 years
  - Driven by large emitters (US, China, Japan, Russia, India, Indonesia, and EU)

- Australia's contribution insignificant – 1 in 100ppm<sup>2</sup> over next 50 years
- +3 degrees, 450-550ppm GHG by end 2100, -60% by 2050 target
- Programmed in for next 20-30 years

- Climate Change is the consequence
  - Adapting to a warmer (Syd>Bris), and more volatile, climate
  - Water
  - Emergency response systems
  - Building codes, housing specifications
  - Green industries

**QUESTIONS TO THINK ABOUT**

- Is Climate Change THE ISSUE of our generation – but consider poverty, malnutrition/famine, health/AIDS, illiteracy/education, terrorism, ethnic violence, drugs, paedophilia, crime etc. However, it is different. Challenges like AIDS, famine, crime.. can be met/abated with local initiatives. Global warming cannot be affected by any number of domestic Australian initiatives unless they have global applicability (eg innovative clean coal technology).

- Do we plan for and invest in energy growth (double electricity usage before 2050 – a/c, appliances esp plasma TVs), or drive for energy reduction (conserve our way to prosperity)?
- What is driving our energy debate? Elsewhere:
  - Peak oil
  - Dependence upon Middle East supply
  - Russian gas
  - Fork in the road – depletion of North Seas oil and gas

Is Australia different? Energy security not a driver. Indeed, with 90% electricity from abundant fossil fuels, energy is a source of competitive advantage. Australia may be one of the few countries to abandon a source of competitive advantage in pursuit of a higher environmental goal!

<sup>1</sup> GHG: green house gasses

<sup>2</sup> ppm: parts per million by volume

## Notes on CLIMATE CHANGE / NUCLEAR POWER: 12 Oct 2007 2

### FACTS

- Familiar range of energy options: coal, gas, oil, hydro, nuclear, wind, solar, geothermal, wave, tidal, biomass
- All energy technologies have undesirable side effects, risks or special challenges
- Baseload vs intermediate and peak load supply – the (intermittency) challenges of renewables
- Hierarchy of GHG emissions: Brown coal, black, gas, solar, nuclear, wind, hydro
- Even with the urgency required by energy security and global warming, technology shifts occur over 20-50 years
- **Nuclear Fuel Cycle:**
  - Australia's uranium – 38% etc, maybe more with Olympic Dam upgrade etc
  - 31 nuclear powered countries
  - 443 reactors >>> 1000 by 2050?
  - 150 ocean going vessels (submarines, aircraft carriers, ice breakers)
  - 15% global electricity generation; 31% of EU
  - China, Taiwan, India, Pakistan, Japan, S Korea are nuclear powered in our Region
  - Plus Indonesia and Vietnam as part of 20 new countries by 2020
- **One scenario**
  - 25 reactors by 2050
  - 18% reduction in GHG vs business as usual
  - Not a silver bullet, but important part of portfolio

### RESERVATIONS ABOUT NUCLEAR POWER

- Management of long lived radioactive waste
- Costs of nuclear power
- Timeliness – 15 years to first reactor
- Location of reactors – NIMBY
- Proliferation
- Terrorism
- Possibility of catastrophic accident (eg Chernobyl)
- Insurance
- Use of water
- Lack of bipartisan political support – sovereign risk

Common to most countries, but with answers acceptable to most communities.

But if we are to decarbonise our economy, and continue on a path of improving standards of living and prosperity, then any strategy for adding the required baseload electricity generation capacity must consider nuclear power.

### STATUS OF DEBATE AND OUTLOOK

- National consensus re gravity of Climate Change challenge
- Bipartisan support for an Emissions Trading Scheme to limit GHG
- Bipartisan (federal) support for removing limits to Uranium mining and export
- Investment in education, skill building in relevant disciplines
- Continuing public education program
- Support for Generation IV reactors R+D; role for ANSTO<sup>3</sup>; GNEP<sup>4</sup>
- Outcome of the Federal Election will define direction re nuclear

### REMAINING QUESTIONS

- What should be our climate priority – mitigating global warming by reducing GHG, or adapting to inevitable climate change?
- What is proper role for government – picking winners (eg through MRET<sup>5</sup>), or setting up a level playing field of rules/incentives?
- Should Australia lead or follow? Why does Al Gore keep coming to Australia?
- Is the cost of environmental responsibility acceptable? Will a green future provide opportunities for entrepreneurial, far sighted, innovative Australians in larger proportion than the cost?
- The future of coal – should 'clean coal' be our national priority?
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### CONCLUSION

**The gravity of the challenge is appreciated. The complexity of the topic may be overwhelming. Urgent action is being demanded. You are confronted by many choices and shifting priorities. You can't ignore legacies and begin with a clean sheet. So what will you do? Where are the leaders among you?**

Thank you

Ziggy Switkowski

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<sup>3</sup> ANSTO: Australian Nuclear Science and Technology Organisation

<sup>4</sup> GNEP: global Nuclear Energy Partnership

<sup>5</sup> MRET: Mandatory Renewable Energy Target