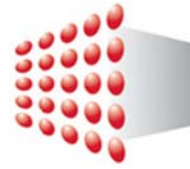


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Nuclear Power: Time for a Feasibility Study

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ABSTRACT

There are now many more nuclear energy plant designs to consider than there used to be. Some power plant companies are now claiming that a buffer zone of only a couple of kilometres, or even less, is required and that the new plants have features which greatly reduce the chance of accidents. Singapore needs to decide on what is an acceptable level of probability for a nuclear power plant accident. If what some major power plant companies are saying today about drastically reduced space requirements, improved safety features, and so on, is true, Singapore cannot afford not to consider the nuclear option.

KEY WORDS

Singapore, Nuclear Power, Electricity, Climate Change

1. The Economic Strategies Committee in its recently released report, *Ensuring Energy Resilience And Sustainable Growth*, recommended that Singapore study the feasibility of nuclear energy and develop expertise in nuclear energy technologies.
2. In November 2008, Minister Mentor Lee Kuan Yew delivered the Singapore Energy Lecture at the annual Singapore International Energy Week. He noted that following the two oil crises, the Singapore Government had focused primarily on providing energy at reasonable cost. But now it had also to consider the consequences of CO₂ emissions and climate change.
3. He commented: 'We can try and be the greenest city in the world and it's not going to make any difference in the outcome. So what's the point of it? Well, the point is if we don't do this, we'll lose our status as a clean, green city and we'll lose our business and we'll lose our extra premium for being an unusual city... The real alternative that can produce the electricity generation to match oil and gas is nuclear.'
4. He then went on to describe the siting problems of a nuclear plant in Singapore. Where to put it? Singapore is small and it is physically impossible to meet the 30km radius safety requirement for a nuclear power plant. This seemed to be the end of the story.
5. However, MM Lee was referring only to what might be called 'conventional' nuclear power plant technology. Things are changing. There are in fact now many more nuclear energy plant designs to consider than there used to be. Many modifications and improvements have been made since the horrific accidents

- which took place over 25 years ago at Three Mile Island in the United States and Chernobyl in the former Soviet Union.
6. Some power plant companies are now claiming that a buffer zone of only a couple of kilometres, or even less, is required and that the new plants have features which ostensibly greatly reduce the chance of accidents.
 7. Yet we all know that the probability of a nightmare scenario can never be reduced to zero. This, and the seemingly impossible dilemma over where to put the radioactive waste that a nuclear plant produces are why Germans, for example, have voted to close down all existing nuclear power plants in the country and never build another.
 8. In Asia, however, a nuclear renaissance is taking place. Dozens of new nuclear plants are under construction or being planned in China, Japan, South Korea, India and Pakistan - and also in Singapore's backyard: Vietnam, Thailand and Indonesia have announced their intentions to build nuclear power plants, while Malaysia and the Philippines are formally exploring the nuclear energy option.
 9. Why? Because most of these governments face rapidly growing demand for electricity over the coming decades. They have few options other than the nuclear one and the costs are not insurmountable.
 10. The region's oil resources are relatively small and dwindling and its gas reserves are also insufficient. Increased reliance on imported energy increases a country's vulnerabilities to price and supply shocks which can cause immediate and long-

lasting economic and social damage. The planned massive increase in the use of coal to fuel hastily built thermal power plants in the short term flies in the face of global attempts to reduce carbon emissions. The development of renewables is uncertain, costly and cannot provide the vast quantities of reliable energy the region requires.

11. Singapore is currently producing from waste incineration only about 2 per cent of its electricity requirements. Eighty per cent of its electricity is generated from gas; and almost all of that gas comes from only two countries - Indonesia and Malaysia. Even if solar, geothermal and other renewable forms of energy were developed, Singapore would still remain in an extremely vulnerable position.
12. What Singapore needs to do in its 'study of the feasibility of the nuclear energy option' is to decide on what is an acceptable level of probability for a nuclear power plant accident.
13. Realistically, because Singapore is so small, if a major nuclear accident were to take place here, it faces becoming a nation of refugees. That degree of risk is obviously unacceptable. But if what some major power plant companies are saying today about drastically reduced space requirements, improved safety features, and so on, is true, Singapore cannot afford not to consider the nuclear option.
14. There are now internationally recognised levels of risk attached to all of the new nuclear plant technologies and designs on the market. It is not the game of roulette that it used to be. Instead of dismissing the nuclear option outright, Singapore must carefully study these various levels of risk and get a sense of perspective.

15. What level of risk is acceptable? In planning the provision of reliable supplies of energy in 15 to 20 years' time, Singapore should carefully weigh and verify the claims of the nuclear power plant companies that are promising such high safety and reliability standards. Singapore should also learn from other countries' experiences and give the public ample opportunity to voice their concerns and share information.

About the Author

Elsbeth THOMSON is a Senior Fellow at the Energy Studies Institute, National University of Singapore. She received her PhD from the School of Oriental and African Studies, University of London. Her main research interests are Asian energy economics and security, and Asian transport. She authored *The Chinese Coal Industry: An Economic History* (London



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