

Report of 18 July Meeting 2013
Royal Society
Southern Highlands Branch

Speaker: Mr Tony Irwin

Topic: *Nuclear Energy for Australia*

With 434 reactors operable in 31 countries, nuclear power has been an important source of energy security for many countries for 50 years. The advantages of nuclear as a baseload, low emissions generation technology are clear and understood, but there are often concerns expressed about safety, cost and radioactive waste. In addressing his 50-person audience, Tony Irwin examined these concerns and presented options for nuclear power in Australia.

Some of the main advantages of nuclear power are that it operates without greenhouse gas emissions and that reactors do not have to be located close to the fuel source. The NASA Goddard Institute for Space Studies and the Columbia University Earth Institute estimated in 2013 that global nuclear power had prevented an estimated 1.84 million air pollution related deaths. If the deaths per Twhr are compared across global averages for 7 different technologies, nuclear power is a clear winner. For comparison, nuclear scored <0.1, wind 0.15, solar rooftop 0.44, hydro 1.4, gas 4, oil 36 and coal 170.

Tony Irwin also presented interesting and telling comparisons of greenhouse gas emissions from electricity generation. With all units measured on the same scale, France with high dependence on nuclear technology scored 79, Tasmania with good levels of hydro 320, UK 457, China 766, Australia 841 and Victoria the high figure of 1200 due to its dependence on brown coal. Clearly, nuclear technology is the lowest cost, proven, low emissions baseload for electricity generation for Australia.

Many questions were asked by the audience concerning the safety aspects of nuclear technology, in particular the recent events at Fukushima. That led to a lengthy discussion on “safety culture” and risk assessment. The speaker’s opinion was most reassuring, as he described the safety aspects of the reactors themselves. In the case of Fukushima, which he visited on numerous occasions after the crisis, he was of the opinion that external factors, such as the insufficient height of the seawall, were largely to blame. Other nearby reactors with adequate walls were not affected in the same way. He praised the rapid response of the Japanese authorities in removing people from the danger zone. No lives were lost.

Tony Irwin commissioned and operated eight nuclear power stations for British Energy for more than 30 years. He was Reactor Manager at ANSTO during the commissioning and early operation of the new OPAL research reactor. His experience with the nuclear fuel cycle also includes managing fuel strategies for ANSTO and representing Australia

at international meetings. Following the Chernobyl accident, Tony was a member of the World Association of Nuclear Operators (WANO) team who worked with Russian engineers to improve their safety culture. He is currently chairman of Engineers Australia Nuclear Engineering Panel.

With this wealth of experience behind him, Tony Irwin is of the firm opinion that SMRs –small modular reactors – are an emerging option for Australia. This recommendation is made on the basis of the small grids required in Australia and the remote locations that have to be served. He emphasized the extensive support and guidance that is now available to countries starting a nuclear program, particularly from the International Atomic Energy Agency (IAEA)

Anne Wood