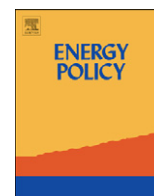




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Book review

Contesting the future of nuclear power: A critical global assessment of atomic energy, B.K. Sovacool. World Scientific, NJ (2011). 308 pp., \$70. ISBN: 978-981-4322-75-1

Nuclear power is often promoted as clean, 'green', safe and affordable, a technology that can be brought on line rapidly to mitigate global climate change. Its proponents claim that, as a result of these alleged characteristics, nuclear power is undergoing a renaissance. A plethora of books, articles, media reports, Wikipedia entries and Google entries are pushing this line. Therefore, it is refreshing to read a scholarly critical analysis of these claims. Sovacool's book addresses among other issues the current status of the nuclear industry, its fuel supply, accidents, environmental impacts, social risks, life-cycle energy payback, economics and subsidies. It has a postscript on the 2011 Fukushima disaster. With detailed documentation, the book shows that "new nuclear plants are excessively capital-intensive, take years to build, are prone to cost overruns, and are economically competitive only when significantly subsidized. The history of operating performance shows an unacceptable rate of incidents and accidents that will grow in proportion with greater nuclear power generation. Secondary reserves of uranium will likely be exhausted before the end of the coming decade and high-quality reserves of primary uranium are already hard to find, contributing to rising and volatile fuel prices". (p. 1)

Furthermore, the book points out that there is no 'nuclear renaissance'. Nuclear power's percentage contribution to global electricity generation has declined steadily from its peak of 17% in 1993 to 11% in 2011 (Schneider and Froggatt, 2012). Nuclear generating capacity and electricity generation reached a plateau around 2005–2006 (Schneider and Froggatt, 2012). Although there are expanding programs of nuclear power construction in China, Russia, India and South Korea, on a global scale it appears that these are more than balanced by retirements of aging plants and recently by countries deciding to phase-out nuclear power. Even China's rapid construction will only lift the nuclear contribution to its electricity supply from 2.3% at present to around 5% by 2020. Meanwhile, China aims to supply 15% of its primary energy from renewable sources by 2020. On past experience it is likely to over-achieve that target. Global investment in renewable energy in 2011 was \$257 billion (Bloomberg New Energy Finance, 2012).

The principal strength of Sovacool's book is its detailed analysis of the economics of the nuclear fuel life-cycle, from uranium mining to waste management and decommissioning of reactors. The capital costs of nuclear power stations have been escalating rapidly through the 2000s and are likely to rise even further following checks of reactors around the world after the Fukushima disaster. The book also reviews the little-known research which shows that the life-cycle CO₂ emissions of nuclear power may become comparable with those of fossil power as

high-grade uranium ore is used up over the next several decades and low-grade uranium is mined and milled using fossil fuels.

The only obvious weakness of this valuable book is its brief, superficial treatment of nuclear weapons proliferation from nuclear power. Only 10.5 pages are allocated to this, one of the principal hazards of nuclear power, and much of this space is limited to the potential for proliferation by terrorists. While the risks of future nuclear terrorism are real, there is much credible evidence that the governments of a number of countries have already used nuclear power and/or research reactors either to assist their development of nuclear weapons or to supplement their supplies of nuclear explosives from military reactors. The countries of concern are France, India, North Korea, Pakistan, South Africa and the UK. In addition, the governments of several other countries commenced and (fortunately) discontinued nuclear weapons development from nuclear power, namely Algeria, Argentina, Australia, Brazil, Libya, South Korea and Taiwan. Iran is suspected of currently using the uranium enrichment pathway to develop nuclear weapons. In the light of this history (Albright, 1994; Albright and Hinderstein, 2004; Barnham et al., 2000; Broinowski, 2003; Corera, 2006; FAS, 2013; Global Security.org, 2013; ISIS, 2013; Nuclear Weapon Archive, Britain's nuclear weapons, 2013; Nuclear Weapon Archive, 2013; Kang et al., 2004), it is puzzling that the author has let governments off the hook.

Despite this gap, *Contesting the Future of Nuclear Power* is highly recommended to all who are interested in future energy options. As a whole it successfully balances the extensive pro-nuclear literature. It is well organized, well written and well documented.

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Received 2 January 2013; accepted 3 January 2013

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