

References:

An overview of nuclear power in the context of additional capacity to Kaiga NPP

<http://www.countercurrents.org/2017/07/01/an-overview-of-nuclear-power-in-the-context-of-additional-capacity-to-kaiga-npp/>

Nuclear Power in the Context of Global Warming; Vol. 49, Issue No. 17, 26 Apr, 2014

<http://www.epw.in/search/site/shankar%20sharma>

Electricity Governance in India", 2014

<http://ksm.sagepub.com/content/3/2/109.abstract>

The total cost for scrapping the nation's nuclear power facilities - excluding Fukushima No. 1 nuclear power plants and other facilities under construction - is estimated to be about ¥6.72 trillion (S\$84.2 billion), according to a tally by The Yomiuri Shimbun. The cost for decommissioning 53 commercial nuclear reactors is estimated to total about ¥3.58 trillion, for an average at ¥57.7 billion per reactor.

<http://www.asiaone.com/asia/costs-scrapping-japans-nuclear-facilities-estimated-842-billion>

Cost Estimating for Decommissioning Nuclear Reactor in Sweden

<https://www.stralsakerhetsmyndigheten.se/contentassets/6fcc4e0aea80454bb5adfa51e171dcfe/201401-cost-estimating-for-decommissioning-nuclear-reactors-in-sweden>

After the Shutdown: Oyster Creek Nuclear Generating Station

<https://njmonthly.com/articles/politics-public-affairs/after-the-shutdown-oyster-creek-nuclear-generating-station-forked-river/>

Former top regulator now says nuclear power 'hazardous'

<https://www.wtae.com/article/former-top-regulator-now-says-nuclear-power-hazardous/25888972>

"I now believe that nuclear power is more hazardous than it is worth," Greg Jaczko writes in his debut book, "[Confessions of a Rogue Nuclear Regulator](#)," which is based on his three years as chairman of the Nuclear Regulatory Commission under President Barack Obama. "Because the industry relies too much on controlling its own regulation, the continued use of nuclear power will lead to catastrophe in this country or somewhere else in the world. This is a truth we all must confront," Jaczko wrote.

Nuclear Power Stations Are Not Appropriate for Australia – and probably never will be

<https://www.climatecouncil.org.au/nuclear-power-stations-are-not-appropriate-for-australia-and-probably-never-will-be/>

Storage of nuclear waste a 'global crisis': report

<https://www.france24.com/en/20190130-storage-nuclear-waste-global-crisis-report>

The 100-page report, compiled by a panel of experts, dissected shortcomings in the management of voluminous waste in France, which has the second largest nuclear reactor fleet (58) after the United States (about 100). "There is no credible solution for long-term safe disposal of nuclear waste in France," the report said.

The True Cost of the Chernobyl Disaster Has Been Greater Than It Seems

<http://time.com/5255663/chernobyl-disaster-book-anniversary/>

" ... the ultimate Chernobyl mortality toll, though difficult to estimate, may yet turn out to be significantly higher. Current estimates place it between the 4,000 deaths estimated by United Nations agencies in 2005 and the 90,000 suggested by Greenpeace International. The cost of the steel arch planned over the old sarcophagus has been estimated at 1.5 billion euros, with the total cost of the New Safe Confinement Project exceeding 3 billion euros. The new shelter over the damaged reactor No. 4 notwithstanding, the area around the nuclear plant will not be safe for human habitation for at least another 20,000 years.

CHERNOBYL disaster

http://chernobyl.undp.org/russian/docs/belarus_23_anniversary.pdf

"Economic damage of the Chernobyl accident is estimated at \$235 billion for 30 years on after the explosion, making up 32 national budgets as of 1985. Chernobyl disaster vastly damaged the agricultural sector of the Belarusian economy, which is worth over \$700 million annually. Due to radioactive fallout, Belarus lost one fifth of all agricultural lands. It also led to contamination of around a quarter of the Belarusian forests, 132 deposits of mineral resources and nearly 350 industrial enterprises."

Is Yucca Mountain back from the dead?

<https://www.hcn.org/articles/is-yucca-mountain-back-from-the-dead>

Yucca Mountain, the project to permanently store high-level nuclear waste underground in southern Nevada, has been considered dead since then-President Obama defunded it in 2012. But now, President Trump has moved to revive it. The Department of Energy estimated in 2008 that the project as a whole would require up to **\$96 billion** to complete; it's already cost taxpayers **\$15 billion**. The state has already filed more than 200 objections to the DOE's application, all of which would have to be resolved — at a cost of up to \$2 billion — before the project could go forward.

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But the ultimate Chernobyl mortality toll, though difficult to estimate, may yet turn out to be significantly higher. Current estimates place it between the 4,000 deaths estimated by United Nations agencies in 2005 and the 90,000 suggested by Greenpeace International.

Japan Fukushima nuclear plant 'clean-up costs double' - BBC News

<https://www.bbc.com/news/world-asia-38131248>

In September, 2017, Tepco and the national government were reported as reaffirming their previous timeline for the cleanup, estimating the decommissioning process would take 30 to 40 years to complete.

Near site of Fukushima nuclear disaster, a shattered town and scattered lives

https://www.washingtonpost.com/world/asia_pacific/near-site-of-fukushima-nuclear-disaster-a-shattered-town-and-scattered-lives/2019/02/02/0dea7886-1e8c-11e9-a759-2b8541bbbe20_story.html?utm_term=.1dab3e85d3b0

Annexure

High level indication of Costs and Benefits of Jaitapur Nuclear Power Project (JNPP) Proposal
(Proposal: 6 X 1,650 MWe Reactors @ 250,000 Crores project cost estimation)

	Societal Costs	Benefits	Comments
Option I (NPCL option for a Nuclear power Project)	About Rs. 250,000 Crores for the main project, without transmission line costs ?	Max. power (net) to the Western Region grid = 5,700 MW	10% of power goes to auxiliary consumption; about 20% T&D loss in Western Region (WR); assumed PLF = 80%
	Additional land for and cost of transmission lines: 6 * 765 kV lines ??	About 50,000 MU annual energy	@ 80% PLF
	Impact on Agricultural /horticultural production & due to radiation fears	Employment for about 500 people during operation?	Export demand for Alfonso mangoes and other export product may come down because of radiation contamination fears
	Fisheries production loss		Anecdotal evidence of loss of fishes near Tarapur NPP
	Diversion of agricultural lands for the project		
	Denial of access to thousands of acres of land for grazing; wood and fodder collection		
	Impact on fresh water Sources		
	Impact loss on areas of ecologically very high value (bio-diversity hotspot)		
Option II			
Efficiency improvement In the existing system (T& D loss reduction)	@ 25% of cost of a new Coal power plant: about Rs, 12,000 Crores	About 5,500 MW can be saved; OR a virtual additional generation	T&D loss reduction from 20% to about 9% in Western Region; demand met in WR was 50,500 MW in 2017-18 (as per CEA)
		And about 40,500 MU per year of saved energy	Available energy in Western Region during 2017-18 was 368,000 MU (As per CEA)
		None of the other costs JNPP	
Option III			
(i) LEDs in place of incandescent lamps	Not estimated; but will be much less than Rs. 200,000 crores	Estimated to be about 3,000 MW and 5,500 MU per year of energy	Replacement of incandescent lamps by LEDs in Western region

		Saved	
(ii) Loss reduction in IP sets	Not estimated; but will be much less than Rs. 200,000 crores	Estimated to be about 3,500 MW and 42,000 MU per year energy Saved	IP set loss savings can yield about 18 % of the energy consumption in WR (and at national level 18% of 233,000 MU
		None of the other costs of JNPP	
Option IV			
(i) PLF improvement in thermal power plants	Not estimated; but will be much less than Rs. 200,000 crores	About 5,000 MW	Thermal power capacity in WR = 81,415 MW in 2018-19; increase in PLF from 61% to 70%
(iii) Loss reduction in domestic and commercial uses	Not estimated; but will be much less than Rs. 200,000 crores	About 1,000 MW	Replacement of inefficient domestic appliances as fans, TV, refrigerators, water pumps etc.
		None of the other costs JNPP	
Option V			
Renewable Energy (RE): About 15,000 MW of wind PLUS about 5,000 MW of solar power PLUS Energy efficiency Measures	About Rs. 160,000 crores @ Rs. 8 crores per MW for RE sources PLUS Rs. 15,000 Crores for efficiency	About 50,000 MU of annual energy AND None of the other costs (environmental, social and intergenerational costs) of nuclear power	In view of the lower utilization factor for RE Sources, much higher installed capacity will be required. Combined with the efficiency measures this RE option can provide much more benefits than the nuclear power and at much lower overall costs.