The Global Warming Wild Card

In Varun Sivaram's article. he seems to indicate that wind and solar can make a big difference in India's energy mix and can relieve her use of coal. Nuclear energy possibilities are conspicuous by their absence. Like many others, he seems to believe that wind and solar can make big contributions to carbon emissions reduction. They can't. Their incurable intermittency, their low power density, and grid concerns insure that the more they are scaled up, the more intractable their management and integration become.

Conventional nuclear could play a much larger role, but much better would be the development and deployment of the Liquid Fluoride Thorium Reactor(LFTR, "lifter"). The LFTR design surpasses today's conventional boiling water and pressurized water reactors in every way. LFTRs operate at atmospheric pressure because they do not use water cooling, avoiding the need for a large pressure containment vessel. This is a huge cost and construction time saving. The LFTR is inherently safe vs. engineered safe. Had Three Mile island, Cernobyl and Fukushima Daiichi been LFTRs they would never have made the news.

Once started, a LFTR will use thorium as its fuel source. Thorium is three to four times more prevalent in the earth's crust than uranium. 100% of thorium is burned in the reactor as opposed to less than 1% of uranium in a conventional reactor. And it needs no enrichment or fuel rod fabrication – very expensive procedures. This also means much less, and much less radioactive, waste.

With proper design, LFTRs could run without cooling water, a great advantage in arid regions.

There are other advantages too numerous to mention in this forum. LFTRs can be developed and deployed by using known engineering and scientific principles. *Scientific American* would do a great service by publishing a full-length article on the Liquid Fluoride Thorium Reactor.

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