

Myths and Misunderstandings About Nuclear Energy

Is Nuclear Power - Economically, Environmentally or Socially- A Viable Solution for our Energy Security?

At this time, when our National Leaders and Atomic Energy Commission are advocating Nuclear (Fission) Power (NP) for energy security of the country and to support an economic growth rate of about 10 percent plus per annum, it is important that the facts are made known and that legitimate arguments against & for Nuclear Power are heard and given due consideration, before opting for Nuclear Power.

Energy Security

Energy Security is better defined as the Nation's ability to sustain adequate, reliable Energy Services in ways that maximize economic competitiveness and minimize resource utilization and environmental degradation, leading to sustainable development. For Energy Security, the Supply and Demand Side factors need to be tackled simultaneously. How does Nuclear Power addition meet this requirement?

Sustainable Development

The philosophy of Sustainable Development tends to favour strongly the anticipatory approach, rather than the reactive approach to environmental policy, resulting in non-declining natural wealth, without compromising the ability of future generations to meet their own needs. How does Nuclear Power contribute to Sustainable Development?

President A.P.J.Abdul Kalam sets a target of 50,000 MW NP by 2030

Addressing a meeting at the Koodankulam Nuclear Power project site on 22 nd September 2006, the President A.P.J.Abdul Kalam is reported to have set the target of 50,000 MW nuclear power by 2030, by which time the generating capacity should increase to 4,00,000 MW from the existing 1,30,000 MW, (NP of 3,310 MW), in the pursuit of achieving "Energy Independence"

Atomic Energy Commission Chairman, Anil Kakodkar

Making a presentation on "Future Energy Basket" at the third International Seminar and Exhibition on 'Exploration Geophysics' at Hyderabad on 8 th November 2006, AEC Chairman Anil Kakodkar is reported to have said that there is a strong correlation between per capita GDP and per capita Electricity Consumption and a ten-fold growth in electricity generation capacity is necessary over the next 50 years.

He is also reported to have said that an increase in the share of Nuclear Energy in the country's energy mix, beyond what is possible based on the domestic programme, is desirable to minimize stress on global fuel resources and from local, regional and global environmental considerations.

Planning Commission Integrated Energy Policy Report

The "Integrated Energy Policy Report" submitted in August 2006, by the Expert Committee of Planning Commission, highlighted "Environmental Impacts of Nuclear Power" (13.1.2) under the Chapter Energy Environmental Linkages.

"--The Nuclear Power is associated primarily with risks of radioactive release. Environmental Impacts identifiable at various stages of Nuclear Fuel Cycle are *Mining (accidents, release of Radon Gas and radioactive dust from Uranium mines and mills) * Radioactive Seepage from waste and land degradation, * Processing (accidents) * Transport (accidents & risk of proliferation) and * Electricity Generation (risk of catastrophic accidents, low and high level of radio active wastes).

Additionally decommissioning of Nuclear Plants entails the disposal of radioactive wastes. While significant technological development has been made in the area of radioactive waste disposal and decommissioning, they are yet to be proven at large enough scale to satisfactorily resolve economic issues.

However despite these risks, global data suggests that of all the conventional options, Nuclear energy has posed the least risks in terms of mortality per billion megawatt hours of generation"

Gorbachev Urges G8 to Back Solar Power, Not Oil or Nuclear

The former Soviet President Mikhail Gorbachev--who chairs an environmental think tank, "Green Cross International"- in a statement, making at the 20th anniversary of the Chernobyl nuclear disaster, warned that oil or nuclear energy were not viable energy sources for the future. He urged the leaders of world's biggest industrialized nations - the Group of Eight (G8)- met in July 2006, to set up a 50-billion-dollar (44-billion-euro) fund to support solar power and renewable energy sources. Cutting subsidies for fossil fuels like oil and coal could easily raise the fund, he said

Gorbachev also said that nuclear power "doesn't add up economically, environmentally or socially". The Nuclear power is neither the answer to modern energy problems nor a panacea for climate change challenges, he claimed.

Fidel Castro enquired about Renewable Energy Technologies

Cuban President Fidel Castro, when Prime Minister Dr. Manmohan Singh called on him in Havana in September 2006, wanted to know what India was doing in the area of Renewable Energy and reported to have said that Cuba was interested in learning from India on Alternate Energy technologies.

Open Letter To The Finnish Parliament

“We are writing to respectfully offer our advice on the forthcoming decision of the Finnish Parliament on whether to contract a new nuclear power plant. In view of the declining economic viability of nuclear power as well as its eroding public support in all civilized, democratic nations, Finland would be making a huge mistake, and placing its economy in jeopardy, by ordering a nuclear power plant at this time.

We respectfully recommend that instead of deciding to construct a new reactor, the Finnish government decide instead to commission an equivalent amount of power generation in the form of decentralized wind power and bio-energy.-----

We wish you wisdom and responsibility in the important decision that now lies before you”.

-Christopher Flavin, Worldwatch Institute, USA

The Chernobyl Legacy

“Chernobyl is a word we would all like to erase from our memory. It opened a Pandora’s box of invisible enemies and nameless anxieties in people’s minds, but which most of us probably now think of as safely relegated to the past. Yet there are two compelling reasons why this tragedy must not be forgotten. First, if we forget Chernobyl, we increase the risk of more such technological and environmental disasters in the future.

Second, more than seven million of our fellow human beings do not have the luxury of forgetting. They are still suffering, every day, as a result of what happened 14 years ago. Indeed, the legacy of Chernobyl will be with us, and with our descendents, for generations to come.”

-- Kofi Annan, April 2000

Former Secretary General, United Nations

Some Quotes about Nuclear Power

“Electricity is but the fleeting byproduct from Nuclear Power. The actual product is forever deadly radioactive waste.”—

-Michael Keegan, Coalition for a Nuclear-Free Great Lakes

“It would be prudent to invest just as much money and imagination in Solar Energy as hitherto put into Nuclear Power”.

--Gro Harlem Brundtland, Berlin 1987

“Our technological society exhibits at one and the same time breathless intelligence and abysmal lack of wisdom. That we can produce Trident submarines shows how smart we are; that we do in fact produce them shows how completely idiotic we are”

-F.E.Turner: Abandon Affluence

Deep Divide Over Nuclear Power

The early dreams of Nuclear Power proponents appear to have faded, where as the risks have remained, as well as the danger of misuse by military interests. Terrorism has introduced a dramatic, concrete threat. The finite nature of fossil fuels and global warming do not dispel the major safety issues and hazards associated with nuclear power. The ‘accident proof’ reactor has remained an unfulfilled promise now for decades.

But the friends of nuclear-based electricity generation are gratified by the fact that the discussion on nuclear policy has shifted from the fundamental problems of safety and security, to issues associated with the economy, environmental protection (global warming) and resource conservation. They would like to see a shift in the public opinion toward viewing nuclear power as one of the technologies, like coal fired power plants, windmills etc to meet the growing demands of power and to reduce global levels of greenhouse gasses emissions.

The nuclear power is being pushed into the triangle that economists use to frame the debate on Energy Policy; namely economic feasibility, reliable supply and environmental compatibility. Even within this framework, many questions remain regarding the advisability of opting for nuclear power.

But the nuclear energy’s unique potential for catastrophe is being concealed behind the wall of arguments that distract from the basic issues of Safety and Security. This is the result of a deliberate and tenacious strategy for years by operators and vendors in the major nuclear power producing countries.

Therefore, the urgent need of the hour is to take a look, if the industry’s claims that Nuclear Energy is Safe, Cheap, CO2 Free and Renewable. One also needs to examine its efficiency and cost-effectiveness, apart from the transparency in its functioning. Let us take a look at a few aspects of nuclear technology and the claims being made:

Is Nuclear Power Experiencing a Comeback?

There is lot of political talk about nuclear power being the solution to all our energy problems, but in practice not much happened. In 1989 there were 172 operating nuclear reactors in Europe. There are now 147-15% less. Since the Chernobyl disaster in 1986, only one construction process of a nuclear power plant has started in Europe (Finland).

Despite nuclear power's promise as a clean energy source that could hold down emissions of global warming gases, most environmentalists are skeptical of the latest claims by its advocates. They say that utilities, at best, will move ahead with a handful of plants that will receive lavish incentives from the government. But the risks of nuclear power are still so high, they argue, that no utility will be willing to put its own money into building a plant unless the governments heavily subsidizes it.

“What dismays me about the present situation is the extent to which the Congress and the administration, and now an occasional state legislature, have rushed to anoint it as the solution to climate change,” said Peter A. Bradford, a former member of the [Nuclear Regulatory Commission](#) and former Chairman of the Public Service Commissions of both Maine and New York. If nuclear plants cannot compete without subsidies, he said, they should not be built.

The proponents of Nuclear Power profess that the present day reactors are ‘accident proof’ and there is no danger of accidents. It is also argued that of all the conventional options, Nuclear energy has posed the least risks in terms of mortality per billion megawatt hours of power generation and more people die in road accidents than in nuclear reactor failures / accidents. Does that mean that we should carry the Snake around our neck as less people die of Snake bites? What needs to be considered are the anticipatory risks and hazards of the entire life-cycle of nuclear power i.e. from uranium mining to disposal of spent uranium, instead of considering the hazards of nuclear reactors in isolation.

Is Nuclear Energy (fission) an Infinite Source?

Nuclear energy makes us dependent on uranium, which is a limited resource. If the current level of nuclear energy production is maintained, it is estimated that all (currently and future) accessible uranium would be dug up in next 50 years. There is more uranium on the planet, but it is either very difficult and / or expensive to mine or not suitable for use in electricity production. The associated energy use and CO2 emissions would rise steeply. As per one estimate, the entire accessible uranium in India is just enough to produce 10.000 MW!

Foundation Science, PHYSICS for Class 10, authored by H.C.Verma PhD and published by Bharati Bhavan, in page 142, it is stated that “Unlike fuels like coal, nuclear fuels such as uranium and thorium are required in very small quantities to generate electricity in power plants. The reserves of nuclear fuels, although limited, will last for long, long time. They are therefore also classified as renewable sources of energy”. This highlights, how the scientific distortion of facts is taking place even at the school level?

Does Nuclear Energy provide Energy Security?

The present share of nuclear energy in the total global energy consumption is reported to be just 2.7%, with 442 nuclear power plants worldwide. The China has been forecasting the construction of numerous nuclear power plants over the last 25 years but so far, it has only built eleven out of which three are very small. In India, the installed capacity of the nuclear power plants is just over 3,300 MW, much lower than the power generated from Wind Mills.

If the entire accessible uranium (currently and future) is estimated to last for only next 50 years, at the current level of nuclear power production, which is hardly 3%, how does it provide global energy security? If India has to depend on imported nuclear fuel (uranium) as stated by AEC Chairman (beyond what is possible based on the domestic programme), how is country’s energy security guaranteed?

Must Energy Consumption Rise in Lockstep with Economic Growth?

It embodied the myth that economic vitality requires steadily increasing energy consumption. But people do not want supplies of raw energy, such as kilowatt-hours or barrels of oil. Rather they want the services that energy can provide – comfort, illumination, mobility, steel making etc. On the other hand the increasing energy use, costs and pollution would spiral upwards together, further imperiling National Security, the Economy and the Environment.

The present method of Economic Accounting does not internalize the environmental costs, due to environmentally harmful economic growth. Since the present calculations used to produce GNP/GDP, do not consider Environmental Accounting, namely-- the destruction or depletion of natural resources, the negative impact of environmental damage on the economic welfare of the society, present & future, and the treatment of degradation or depreciation of natural and environmental resources-- this popular economic measure is extremely misleading. It tells us we are making progress even as our ecological foundations are crumbling.

The per capita energy consumption of energy in India , is just 3.5 per cent of the per capita energy consumption of the US, 6.8 per cent of Japan, 37 per cent of Asia, and 18.7 percent of the world average. India’s energy intensity (energy consumption per unit of GDP), however, is high compared to Japan, the US, and Asia as a whole by 3.7, 1.55 and 1.47 times respectively. This indicates inefficient use of energy with a substantial scope for energy savings.

It is nothing but suicidal trying to target for higher per capita consumption of energy, instead of trying to improve efficiency and cutting down the energy intensity, through technological innovations.

Does Nuclear Energy Combat Climate Change?

During the complex cycle of nuclear energy production (uranium ore mining, transportation, processing, enrichment, production, reprocessing, decommissioning, waste storage) a lot of energy is required and used – energy that comes mostly in the form of fossil energy. Nuclear energy is a very energy-intensive way of producing electricity.

Extensive studies have shown that each dollar invested in using energy more efficiently by the consumers reduces nearly Six times more CO₂, than a dollar invested in nuclear power. Nuclear Power is a hopeless substitute for Oil ! The energy efficiency measures and renewable energy sources are cheaper and faster ways to combat climate change.

Is Nuclear Energy Cheap?

When nuclear reactors were first commercialized almost half a century ago, every self-respecting electric utility wanted one. They were encouraged by a government that saw nuclear energy as a peaceful, redemptive byproduct of the deadly power unleashed at Hiroshima. The US federal official for promoting nuclear energy, Lewis L. Strauss, said it would produce electricity “Too cheap to Meter.” It has never given consumers anything like that. But with the industry now consolidated so that most reactors are in the hands of a comparatively few operators, utility executives are sharply divided over whether nuclear power offers an attractive choice as they seek to satisfy a growing demand for electricity.

Nuclear energy is not only a high-risk technology in terms of safety, but also with respect to financial investment. It does not stand a chance in a market economy without state subsidies. The costs for decommissioning are very high and the cost of isolating radioactive byproducts/wastes from the biosphere and safeguarding them for hundreds of thousands of years, which defy human imagination, cannot even be estimated.

There is lot of public money going into nuclear research, safety investments etc. Of the total annual energy subsidies in the EU between 1990 and 1995, 23% went to nuclear energy and only 7% to renewable energy sources. In India the entire nuclear energy is funded by public money at the cost of renewable sources of energy.

While computing the economic cost of any generating facility the economic calculation of different energy systems should include all costs and benefits for society by their production and use.

Who is Accountable for Hazardous Radioactive Wastes?

The more important issues like the problems of radiation right from Mining and Processing of uranium ore to production of Nuclear energy to the storage of Nuclear Waste are being overlooked. The quality of the uranium ore in India is so low, i.e., only 0.0407%. Getting hardly one ton of usable uranium from 3000 tons ore processed every day. The only thing that will be left after 300 days of operation per year and 30 years of mining and processing, is a mind boggling, 2 Crores and Seventy lakh (27 million) tons of RADIOACTIVE WASTES, spread all over the surrounding areas, contaminating air, soil, underground and surface waters.

Who is accountable for all these radioactive wastes, which will be left unattended after the closure of the mines and will continue to affect future generations for hundreds of thousands of years, which defy human imagination? But political expediency makes even honest people with integrity, overlook fundamental stark naked truths.

What are the Viable Alternatives for Sustainable Energy Security?

Nuclear power is not sustainable, because its fissile fuel materials are as limited as fossil fuels such as coal, oil and natural gas. It does not stand a chance in a market economy without state subsidies. It is also high-risk technology in terms of safety and also with respect to financial investments.

There is a huge potential of Energy Savings, which is estimated to be about 25 % of the energy consumption in India, through energy efficiency measures and technologies, which in combination of renewable sources of energy, are much cheaper and definitely much safer than building new nuclear power plants. Therefore the energy efficiency coupled with renewable sources of energy is faster and comparatively cheaper, safer and cleaner sources of energy available.

Conclusion

The above are a few thoughts and opinions compiled from various sources and are open for debate and correction, with a view to find solution for the sustainable Energy Security of our country. The Human beings are at the center of concerns for Sustainable Development and the Human beings are entitled to a healthy and productive life in harmony with nature, keeping the human being as the central focus of all developmental activities.

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