

This information was compiled by Hemantha Withanage and Chamali Liyanage of the Centre for Environmental Justice in order to create public awareness on nuclear power.



Don't Nuke Sri Lanka! Demand clean energy! Demand energy sovereignty!

Sri Lanka is generating approximately 14,000 GWH of electricity through hydropower (MW 1205), thermal (MW 500) Independent Power Producers (534MW), Mini Hydro (82 MW) and wind (3MW). Approximately 3300MW coal power plants will be added for power generation by 2020¹. The 2006 report of the CEB generation planning branch has estimated the electricity demand of the country in the year 2020 as 5900 MW. The CEB generation plan -2006 base-case has recommended Upper Kotmale -150MW Oil -945MW Coal (West Coast) -1200MW Coal (Southern Coast) -1200MW and Coal (East Coast) -900MW power plants to be added with an estimated capital cost of over 5 billion USD.

Between 2009 and 2022, an additional capacity of 3575 MW is expected to be required and of this 3155 MW or 88% is planned to be coal fired. By 2022, some 83% of electricity would be generated by coal.

The latest proposal is to generate electricity through thorium based nuclear power plants. While nuclear power generation can be considered in the countries that have no other sources, it is hard to understand the reasons to establish a nuclear power plant in Sri Lanka. Yet, as a sovereign nation, this should be a decision taken by the citizens of Sri Lanka through a democratic and informed and consultative process and not because of the push by those who are having conflict of interests.

This note was compiled for the purpose of providing the general public with some understanding about the nuclear debate in the world.

What do you know about Nuclear Power generation?

- There are many protests by the general public and environmental groups world-wide against to the promotion of nuclear power. Same time, there are some supporters of nuclear power. But my understanding general public in Sri Lanka are not aware about the pros and cons of the Nuclear Power generation.
- It is common knowledge that nuclear power is so far developed by only very few nations due to technology scarcity. Very few countries have the technical know-how in dealing with nuclear power plants. But only a very few developing countries are involved in this risky power generation.

¹ Asoka Abayagunawardena, Future Challenges of Electricity Planning,

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- Nuclear power is a risky and dangerous source of power. It needs pre-processing of nuclear material, maintenance of power plants, waste disposal and decommissioning involving very high risks and sensitive.
- World-wide there have been 99 fatal accidents at nuclear power plants from 1952 to 2009, totaling US\$20.5 billion in property damages. Fifty-seven accidents have occurred since the Chernobyl disaster and almost two-thirds (56 out of 99) of all nuclear-related accidents have occurred in the USA which has access to latest technology.²

The meltdown in Ukraine's Chernobyl nuclear power plant in April 1986 was the world's worst nuclear disaster. The explosion of the nuclear reactor killed at least 32 immediately. However, thousands more have died since 1986 due to related diseases. Over 100,000 people were evacuated from the region following the blast. Radiation is still a problem in the region.³ The Chernobyl catastrophe released one hundred times more radiation than the atom bombs dropped over Hiroshima and Nagasaki.

High Construction costs:

- The high cost involved in a nuclear plant is one of the negative factors which should be considered by countries such as Sri Lanka, whose economic power is not adequate to own a nuclear power plant. Recently built nuclear plants in some countries cost more than several billions of US dollars. Building a Nuclear power plant will lead to a big financial risk. Also it takes more than one decade to construct such a plant.
- For example, there was an estimate created by the Florida Power and Light Company to create a new reactor plant with a price tag of between \$12 and \$18 billion dollars for a single project.
- Nuclear power plants involve very high construction costs with low fuel cost. It can reduce the cost of energy unit with high risks for the people living in the vicinity. While the risk is for the people the benefits go to the construction companies and paid experts.

Mining Thorium:

- The proposed plant may use Thorium as the source of power. According to the researchers Thorium deposits available in the Southern and Eastern coast line of Sri Lanka will not last more than 50-60 years. The problem arising here will be supplying of energy source when deposits are drained.
- Some forecast that world Thorium deposits are available for the next 10,000 years. However, if the material has to be imported the proposed cheap energy targets will not be achieved and will be another burden on the country's finances.

Environmental and health Hazards:

- The environmental hazards arising due to mining of Thorium have to be addressed widely. Extraction of radioactive elements, such as Thorium, gives rise to considerable amounts of radioactive waste, which cannot be under estimated. Some Nuclear lobbyists argue that world coal power plants emit more radiation than nuclear power plants due to the use of

² Benjamin K. Sovacool,

³ Wikipedia

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radioactive material contaminated coal around the world. However, this is not equal to a meltdown of a nuclear power plant.

- Nuclear waste is produced at every stage of the nuclear fuel cycle, from mining and enrichment, to reactor operation and the reprocessing of spent nuclear fuel. Much of this nuclear waste will remain hazardous for hundreds of thousands of years, leaving a poisonous legacy to future generations.
- The safe disposal and transportation of residues of such plants also have to be given substantial considerations. Also social, economic and environmental measures need to be adopted to prevent possible nuclear disasters.
- After half a century of producing deadly long-living radioactive waste, not one country in the world has a method of isolating these wastes from the environment to prevent them from remaining a threat for hundreds of thousands of years in the future.
- Exposure to radioactive material can be deadly, causing health problems including cancer. Deaths have been caused by nuclear power plants along with infertility, health problems, and deadly cancers among people in communities even far away from the damaged power plants. It is also true that there are many residents living around and working in Indian Uranium mining sites facing death and other health problems.
- Safe reactors are a myth. An accident can occur in any nuclear reactor, causing the release of large quantities of deadly radiation into the environment. Even during normal operations radioactive materials are regularly discharged into the air and water.
- There is no safe way to mine, store, or process nuclear materials. Even though nuclear experts claim that nuclear energy is safe, the truth is that there are no guaranteed safe means for containment of nuclear materials. With their access to modern technology, the United States still have not decided how to deal with their nuclear waste. The risk of an accident and exposure increase exponentially through each step in the process of mining, transportation, storage, refinement, and use of nuclear power which then leaves you with enormous amounts of nuclear waste that must be contained and disposed of. Every step of this process carries great risks for the environment and the community.
- Those who argue supporting nuclear power plants are have conflict of interests and are highly paid for the promotion, but are not willing to have a nuclear power plant in their backyards.

Liability:

- Since Nuclear power generation involves high risks from beginning to the end, another factor that may be of interest is the issue of liability. As experienced in other countries, nuclear equipment suppliers will expect an immunity clause before providing equipment or services. The clause(s) will either limit liability to a ridiculously low amount and/or immunize private equipment manufacturers, service providers altogether from any liabilities arising from a meltdown or nuclear disaster.

Energy Sovereignty will not be achieved?

- Nuclear power will not reduce our dependency on foreign oil. Currently 65% of power are generated by the oil based power plants. However, currently 70% oil imports goes to the transport sector. Only around 25% of oil imports are used for power generation. One of the reasons used to support nuclear power is that it will reduce our oil usage. Nuclear power will have minimal reduction of oil dependency since it is producing electricity unless all public transport and other major industries depend on oil converted to electrified system.

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- Energy generation based on local sustainable sources which are mostly independent of the globalised energy sources such as oil, coal and nuclear is the only way to stop dependency on other countries and multilateral corporations, and bring energy sovereignty to Sri Lanka. This can be only achieved by developing local energy generation which includes solar, wind, wave, dendro or even geothermal.
- Developing of many oil based power stations in Sri Lanka was done only prior to the development of technologies to harness renewable energy sources. So it is not necessary to follow the same path of the developed countries now.
- Some people argue that Sri Lanka can still increase its energy consumption which is 17 Giga Jules (GJ), at the moment to achieve its high growth and reach the US level which is 327 GJ. United Kingdom 164 GJ, Japan 129 GJ and India 21GJ of energy per capita per annum. However, Sri Lanka does not need to follow the same path as the developed nations and measure the growth based on the amount of energy per capita use.
- According to "Mahinda Chinthanaya" the Government of Sri Lanka is currently in the process of establishing a policy framework for the energy sector in Sri Lanka. This policy has a special emphasis towards Non-conventional Renewable Energy sources (NRE). Accordingly the government will endeavour to reach a level of 10% of grid electricity using NRE. The target year to reach this level of NRE penetration is 2015."
- Energy conservation is one of the easiest methods that can be achieved if the authorities can create such a programme. However, Energy saving is not actively promoted other than promoting CFL bulbs. Some cheap CFLs available in the market are not energy saving at all.
- Sri Lanka's energy generation and transmission is still mostly in the public hands. We should thank all those who contributed to this situation! This ensures the democratising of energy. However, I believe there is no mandate given to the political authorities to subject the people to nuclear risks without going through the due processes. So citizens of Sri Lanka should demand clean affordable energy.

We are not safe from radiation risks

- Provinces in neighbouring India, such as Kanyakumari district, have developed a number of nuclear power stations without publicity or any consultations with Sri Lanka. This is of course a violation of the principles of neighbouring countries. Any damage can cause radiation risks in Sri Lanka.
- According to the Energy Forum" as at 2010, India has 19 nuclear power plants in operation generating 4,560 MW out of total plant capacity of 140,000 MW which is just 4.2% of the total power requirement of India. India, the sleeping giant which is about to be awakened, can by no means rely on nuclear power. A new nuclear renaissance, such as that already being seen in India, only introduces more risks of future accidents."⁴

Climate change and energy

- Climate change which is the result of unsustainable consumption of the northern nations brings nuclear energy as a solution to climate change. The global civil society and the environmentalists believe that it is the lobby of the multinational corporations and the nuclear developed countries to make more money from the climate catastrophe for which they are responsible. So Sri Lanka should not be entrapped into these business tricks.

⁴ Energy Forum, Nuclear Power: Is it the "Energy Miracle" in the post fossil fuel era? August 2008

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- Nuclear power is not carbon neutral. According to some researches, “the nuclear fuel cycle is responsible for emitting 84 to 122 grams of carbon dioxide for every KWh, mostly from mining, plant construction, and plant decommissioning”.
- Nuclear power will not reduce carbon emissions. While the plant itself, at the point of producing energy may not be emitting as much carbon pollution as a coal plant, it does create equal or greater amounts of carbon emissions during the entire process leading up to that point.
- A new generation of nuclear reactors simply will not deliver the urgent emissions cuts needed to tackle climate change. Even the most optimistic estimates suggest that a new generation of nuclear power stations will only reduce the emissions by 4% by 2024: far too little, far too late, to stop global warming or address the predicted energy gap.

Just a few examples of industrial nuclear incidents that occurred in the world is never far away from the next nuclear catastrophe:

- Japan, as one of the largest operators of nuclear power had its worst nuclear accident in 1999 at the Tokai-mura nuclear fuel plant when two workers received lethal doses of radiation; one year later, it was revealed that vital safety data and inspections had been manipulated at tens of reactors to avoid 'expensive' repairs and lengthy closures;
- In 2004, a steam explosion at the Mihama reactor killed five workers and in 2006 a district court ordered the shut down of a nuclear reactor as it could not withstand severe earthquakes - all of Japan's reactors are sitting on top of one of the world's most active geological faults;
- The US, with the world's largest fleet of nuclear power plants, only just avoided a catastrophic accident at the David-Besse reactor in 2002, when it was discovered that corrosion had come very close to penetrating the vital pressure vessel - an accident scenario that can lead to a complete reactor core meltdown. Greenpeace had filed a complaint to the US nuclear regulator warning of the risk of corrosion at all US nuclear power plants ten years before. The warning was ignored; following the discovery at David-Besse, it was shut down for two years (costing US\$600 million), but then given a licence to operate until 2017;
- French nuclear safety agency activated its Emergency Response Centre in December 2003 in response to torrential rainfall along the lower Rhone River, following the emergency shut down of two reactors (Cruas-3 and -4) due to flood affected damage;
- In 2000, the UK Sellafield nuclear fuel processing site was found to have a fundamental failure of safety culture by Government inspectors - but only after public disclosure of violations of quality control and safety standards at its newest nuclear plant (Sellafield MOX Plant). This helped convince the government of Ireland to launch a legal challenge against the UK government at the UN International Court in Hamburg on the issue of nuclear safety at Sellafield.

Source: Greenpeace.org

What other alternatives are available?

- Viable sources of clean renewable energy already exist in the world. Solar wind, dendro, wave power, small hydro are still underdeveloped in Sri Lanka. As argued by the Energy

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Forum⁵ and some local energy experts, we have the potential to build wind energy, solar and wave as alternatives. We already have the technology available for clean and renewable forms of safe energy that have lower costs than nuclear power, including wind and solar, which could create thousands of new jobs, boost the economy, and give us a safer solution for the future.

- In the non-conventional renewable energy sector, 182.481 WM capacity of commissioned projects are operated, 83.950 MW of standardized power purchased agreements are signed and 544.432 MW of letters of intent issued for projects as at 31/10/2009.
- It is estimated that 0.5 Million (500,000) hectares of the existing 1.6 million hectares of scrub and chena lands in Sri Lanka could (based on a modest yield of 20 tonnes /ha./yr) provide 10Million (10,000,000) tonnes of sustainable fuel-wood annually. This could produce 10,000GWh of domestically sourced electricity annually from about 1,200 MW of small (1 to 10 MW) thermal (wood-fuelled) power stations located throughout the country.⁶
- The windy land is 6% of the total land area. The NREL estimated the potential for 20,000 MW of installed capacity using a conservative assumption of 5 MW per km². Further the NREL estimates about 700 km² with windy lagoons of 24,000 MW. With moderate wind resource potential total windy land area increases to approximately 10,000 km² or almost 15% of the total land area. This amount supports more than 50,000 MW of installed capacity.⁷
- Waves are stable in the South of Sri Lanka since there is no land mass all the way to Antarctica. Strong storms are rare. The wave energy potential of 1 meter off the southern coast of Sri Lanka is about 13 KW in January. It rises to 100 KW by May. The Ministry of Power and Energy estimates that stable electricity can be obtained at a plant factor of 67%⁸.

Authorities argue that the delay of Upper Kotmale and Norochcholai were due to the protests of the environmental groups, which is true. Meantime, the public debate on these developments has taken a long time due to the inability of the authorities to follow the due processes and consider alternative opinions in a positive manner. Meantime cost increase in this development is not necessarily the delay but many other reasons.

There is no debate that Sri Lanka needs to improve its energy security and resolve energy poverty in Sri Lanka. While the rich consume 80 percent of the power, 20 percent of the energy is used by the poor. The rich and poor energy disparity has to be resolved and the poor have the right to demand energy equity. However, it is unacceptable to establish polluted energy generation in the vicinity of poor communities and displace them without their consent. They have right to live in a clean environment and participate in due processes.

Be (a) ware of Nuclear power!

Demand clean energy!

⁵ Energy Forum is local organizations engage in energy advocacy in Sri Lanka.

⁶ Asoka Abayagunawardena, Incorporating social and environmental concerns in long term electricity generation expansion planning in Sri Lanka, 2006

⁷ Asoka Abayagunawardena, Incorporating social and environmental concerns in long term electricity generation expansion planning in Sri Lanka, 2006

⁸ Asoka Abayagunawardena, World without Oil and coal ,2008

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Demand Energy Sovereignty!

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"You cannot solve the problem with the same kind of thinking that created the problems." Albert Einstein