



Position paper on:

Substitute Bill to House Bills 1039 & 4631 & House Resolutions 250 & 257

“Mandating the immediate rehabilitation, commissioning and commercial operation of the Bataan Nuclear Power Plant, and appropriating funds therefor”

(Reps. Jose Solis, Mark Cojuangco, Roger Mercado & Herminia Roman)

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Before everything else, Greenpeace would like to point out that the appropriations outlined in Substitute Bill to HBs 1039 & 4631 & HRs 250 & 257 (heretofore referred to as ‘HB 4631’) are not merely the costs for the rehabilitation and commissioning of the Bataan Nuclear Power Plant (BNPP) but include appropriations for what appears to be the establishment of a national commercial nuclear power program in the Philippines. In other words, HB 4631 is not a bill that seeks the revival of the BNPP alone, but a bill that seeks to create the country's nuclear power program. As such, the one billion USD eyed to revive the BNPP should not be the only point of contention for any budget appropriation for this legislation, but also the implied future costs of an entire national nuclear power program, including the possible commissioning of subsequent nuclear plants to justify the program's existence, which presents a much greater and sustained drain on the country's financial resources on top of the upfront cost of the BNPP rehabilitation itself.

Setting aside the questionable legality of such a move by the Bill's proponents (i.e. assuming the creation of a nuclear power program within a legislation for an entirely different purpose), as well as strong arguments against the use of nuclear power (i.e. inherent safety issues and the fact that it is not a solution to climate change), Greenpeace would like to present to this committee the faulty economics of nuclear power which underpins HB 4631 and the nuclear program it establishes, and how this compares to renewable energy. This in turn should establish how the purported reasons behind the legislation—climate change and energy security—will not be addressed by any nuclear power program.

The BNPP's tainted history is already a hard lesson on how the pursuit of nuclear power has been a gargantuan and unjust burden on Filipinos. Even now, with moves for its revival heralding what appears to be aggressive plans for a national nuclear program, nuclear power may become the altar upon which this country will bankrupt itself.

The faulty economics of nuclear power

Direct costs concerning nuclear power can be summed up as the following: 1) construction costs, 2) operations and maintenance costs (including uranium fuel costs), 3) waste storage costs and 4) decommissioning costs. A detailed examination of these costs reveal that at all stages of a nuclear power plant's lifetime and beyond (i.e. from its proposal to waste storage), nuclear power is a losing proposition for the Filipino people.

Historical and more current experiences of countries with existing nuclear programs show that nuclear power construction have gone consistently over-budget, two to three times higher than what the nuclear industry estimates. In India, the country with the most recent experience of nuclear reactor construction, completion costs for the last ten reactors have, on average, been 300% over budget [1]. An assessment of 75 of the reactors in the United States shows estimated costs to have been USD45 billion, but actual costs to have reached USD145 billion [2]. In Finland, the construction of a new reactor is already EUR1.5 billion over budget [3]. HB 4631 pegs the cost

of BNPP's rehabilitation at USD1 billion, already the cost of a new power plant. Given past experience on nuclear plant overruns and delays, the BNPP's age and documented defects, this cost, an estimate not actually provided by experts in the first place, may well be exceeded.

Until recently, most nuclear power facilities worldwide depended heavily on state subsidies and massive loans. The BNPP's commissioning will be no different. Under HB 4631, the cost of the rehabilitation will come from state budget, with provisions to raise money via surcharges to consumers, and/or international or domestic loans.

For operational costs, the procurement of uranium fuel is also not cost-effective for Filipinos. Uranium for the BNPP will have to be imported, increasing the country's dependence on foreign fuel. Uranium is further subject to large price hikes since the resource is only available to a few countries. More importantly, while HB 4631 sets the operational life of the rehabilitated BNPP as 40 years, studies show that under current global nuclear capacity, known uranium resources will last only 34 years [4].

Section 10 of HB 4631 outlines the allocations for "disposal" of spent fuel and decommissioning costs. It mandates a sinking fund USD0.1 to 0.2 (PHP4.6 to 9.3) per kilowatt hour produced, plus an additional USD0.1 to 0.2 (PHP4.6 to 9.3) per kilowatt hour for costs of radioactive waste disposal and spent fuel disposal.

No study has yet been made on the estimated decommissioning costs for the BNPP once it is operational, but a 2004 report by the US Nuclear Regulatory Commission approximates the cost of decommissioning nuclear reactors to be about USD300-450 million [5]. The whole process can take up to several years to decades. The cost is also not incurred until many years after the plant is shut down, meaning that nuclear plants are not decommissioned until several years after the plant is closed. And if the plant is required to be shut down prior to the completion of its estimated life, decommissioning funds are still needed but will not be available, in which case taxpayers directly shoulder part of the cost [6].

Any amount the power plant sets aside for waste storage (incorrectly called "disposal" in the Bill) will not be enough to cover the actual costs. In fact, waste storage expenses are impossible to calculate due to the long-term nature of storing nuclear waste which remains radioactive for hundreds of thousands of years, and will outlive and outlast any facility constructed. Putting this into perspective, humankind has been on Earth for the last 200,000 years, yet it takes 240,000 years for nuclear waste to be considered safe. This kind of timeframe defies any sort of economic planning which Section 10 of HB 4631 leaves for Congress or 'an IAEA organized re-processor' to work out.

Table 1 below shows how, when all the "hidden" costs are considered in estimates, nuclear power is considered one of the most expensive forms of power currently available on the market.

Table 1. The true cost of power generators, in USD 2007***

Technology/Power Generator	True Cost, USD 2007 (c/kWh)
Nuclear	18
Wind (onshore)	6.7
Solar (parabolic troughs)	12.8
Geothermal	8

***Sovacool, B.K. and Cooper, C. Nuclear Nonsense: Why Nuclear Power Is No Answer to Climate Change and the World's Post-Kyoto Energy Challenges. WM & Mary Environmental Law and Policy Review. Vol. 33:1. 2008.

An enormous hidden cost

Still, beyond all the costs outlined above, there is a hidden cost not planned for but which, once necessary, would constitute the biggest expense of all: nuclear accidents. If plants should malfunction, the costs will reach unimaginable amounts. These are costs for evacuation,

relocation of communities, and health costs, aside from the repair of the plant and the rehabilitation of surroundings. From previous experience of nuclear disasters, these costs amount to hundreds of billions of dollars over a period of decades. The total cost of the Chernobyl accident, for example, is estimated at EUR358 billion [7] or PHP21.6 trillion which is more than 17 times the Philippines' national budget for 2008.

Not only is nuclear power therefore the most dangerous source of electricity, it is by far the most expensive option for power generation. Pursuing HB 4631 is akin to gambling with our country's economic future.

Investment risk

The global nuclear industry promises that the investment cost for new reactors is around USD2,000 per installed kW [8]. However, credit rating agencies like Moody's puts estimates between USD5,000 to 6,000/kW as of October 2007 [9]. Since then, the price tag has increased to USD7500/kW [10]. While there are a significant number of nuclear exports, international financial institutions such as the World Bank and the Asian Development Bank have not funded nuclear power development to any great extent.

Table 2 shows how investment costs for nuclear power compare to renewable energy technologies.

Table 2. Investment Cost projections for Nuclear and RE technologies

Parameter	Nuclear	Solar Photo-voltaic	Concentrating Solar Thermal	Wind	Geothermal	Biomass
Investment cost in USD per installed KW	7500*	3709**	1854**	1483**	8254**	3761**

*New Nuclear Generating Capacity: Potential Credit Implications for U.S. Investor Owned Utilities, Moody's Corporate Finance, New York, May 2008

**Energy [R]evolution: A Sustainable Philippine Energy Outlook, August 2008

Not an answer to climate change or energy security

HB 4631 puts forth nuclear power as a "proactive" solution to climate change and energy security. But clearly, its economic disadvantages heavily outweigh whatever perceived benefits it can offer. Greenpeace further contends that the said benefits of nuclear power are misleading. Studies show that entire nuclear power plant life cycle contributes significantly to climate change. Nuclear power will also not reduce our dependence on foreign fuel: 58% of global uranium supplies come from only three countries [11], can only be processed and enriched by six countries, and is currently only reprocessed in one country.

Renewable energy: the solution

Greenpeace has constantly asserted that the real solutions to the climate change and energy security is renewable energy and energy efficiency technologies, the cheapest and safest sources of power available, and the least greenhouse gas intensive. The potential for renewable energy in the Philippines is vast and far greater than that of nuclear power or fossil fuels. To re-commission the Bataan Nuclear Power Plant is an unwise proposal given our proven renewable energy potential. The Philippine government already chose the right direction with the Renewable Energy Law. Instead of walking into the nuclear trap, our country should now show commitment as an innovator in the ASEAN region, and act as a pioneer and example to the world. Renewable energy and energy efficiency have already proven themselves as credible and realistic. Every dollar spent on nuclear power will stand in the way of securing a safe future, thousands of green jobs and energy independence in the Philippines.

References:

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Greenpeace Southeast Asia
Room 301, JGS Building
30 Sct. Tuason Street
Bgy. Laging Handa
Quezon City 1103
Tel: +63 2 332 1807
Fax: +63 2 332 1806
Email: info.ph@greenpeace.org
Web: www.greenpeace.org.ph