

EGAT's *Thaitanic*

Why Thailand Should Not Go Nuclear



Detailed report articulating Thailand's inevitable challenges with nuclear power plants. Includes map showing where its nuclear power generating plants may get placed -

EGAT'S THAITANIC

Second Edition, with updates written weeks after Fukushima

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This Second Edition includes discussion of Japan's [Fukushima Nuclear Power plant](#) – which has hit by the double whammy earthquake/tsunami of March 2011 – which happened awhile after the first edition of this booklet was published.

FOREWORD: Like many countries worldwide, Thailand is having to take a serious look at future projections of its electricity needs. It has some natural gas reserves on its territory, but those reserves are not expected to be robust for the long term. Thai authorities import natural gas from Burma – and import electricity generated from hydro from Laos.

There is a belief among some Thai politicians and business leaders that nuclear power plants are inevitable for Thailand. They appear so determined to join the nuclear club, that objective perspectives take a back seat. In this text, we'll articulate several reasons why nuclear power plants would be a mistake for Thailand.

So as not to appear all ‘gloom and doom,’ we’ll also clearly show alternatives. Top of those options is ‘concentrated solar.’ Near the end of this text are thumbnail descriptions and contact info for a couple dozen companies which are at the leading edge of solar technology. Some of those companies have already been engineering and building municipal-scale power generation plants. Prices for solar generated Kilowatt/Hours (Kw/Hr) are coming down dramatically, as efficiency rates are going up to unprecedented levels (up to 79%). In contrast, nuclear power generation is nowhere near such numbers for cost or efficiency.

How Thailand meets its future energy needs is an important issue, and the consequences of decisions made today will have repercussion for decades in the future. Indeed, with the prickly issues of nuclear waste, and plants that will eventually have to be decommissioned, dire repercussion could go on for thousands of years.

Some reading this may wonder, or may even take offense - that a foreigner has the audacity to stick his big nose in to Thailand’s business. I feel compelled to speak out, not as a citizen of a country, but as a person in the world. I’ve resided in over a dozen countries, and have been residing in Thailand for an eighth of a century - as long as a quarter of its citizens. I care for the Thai people no more or no less than I care about people from other countries I’m familiar with. I felt compelled to compile this text out of concern, mainly for future generations of Thais, but also for the effects nuclear power plants could have on Thais living today, and the possible adverse affects upon their neighbors.

Thailand has a small land mass, with no part more than a couple hundred Km from a neighboring country. If a worst case scenario befalls one or more Thai nuclear plants, the radiation will not discern between Thais and non-Thais, and radiation certainly gives no heed to national boundaries.

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1. Being an Activist can be Hazardous

The Electricity Generating Authority of Thailand (EGAT) is the state enterprise under the Thai Prime Minister's Office that is responsible for electric power production and transmission. EGAT's activities encompass the development, construction, operation of dams, reservoirs, power plants of various types, transmission system and substations; the production of lignite and its by-products; formulating policies concerning the production and sales of lignite. It's primary function is to provide and sell electricity to people and entities in Thailand.

Being a government owned and state-run enterprise, EGAT is not beholden to shareholders and answers primarily to the ruling elite based in Bangkok. It pays lip service to the general public only to further its agenda. The Thai general public is rather malleable. With a land mass and population similar to France, Thailand is nevertheless a patriarchal society, and their school system is based on learning by rote. In essence, every Thai is indoctrinated to do as they're told - by elders and authorities, and they learn early on - to never complain about inconveniences.

Just one true example which took place on a long-haul passenger train. All its windows were tightly shut. As the hours passed by, the air within got increasingly dank and unbreathable. The Thai passengers may have been aware of this, but they didn't mention it to authorities. The lone farang (foreigner) in the coach asked around, "can we open a window and get some air in here?" Her queries to fellow passengers and train hostesses alike - garnered variations of; 'mai pen rai' (what does it matter) to "mai dai plean" (cannot do anything to change the situation). Finally, in desperation, the farang woman opened a window. It's not known whether she was scolded by the train staff, but at least she and her fellow passengers breathed easier.

In my own little way, I'd like to carry the spirit of that outspoken woman to the nuclear debate in Thailand. Many Thai citizens will believe whatever EGAT tells them with barely a second thought. A relatively small portion of Thais may become aware of the serious drawbacks to building nuclear reactors in Thailand - but all but a few of those more aware citizens will likely opt to sit on their hands with the realization that it's futile to try to counter 'the powers that be.' Plus, Thais know that environmentalists get murdered in Thailand.

More than once activist has been snuffed out for daring to speak out against the establishment. Just as often, Thai law enforcement and their legal system is ineffectual in catching and prosecuting perpetrators.

Case in point: There was a young activist in the south who was generating awareness about the mangrove forests being cut down to make way for shrimp farms. He was telling residents there that when the farms got too polluted and no longer yielded shrimp, the farmers would leave the scarred area behind with no rehabilitation or replanting – and go on to the next mangrove area. He was murdered. Another young activist was murdered in a different part of the south due to his efforts to draw attention to the drawbacks of building an oil pipeline. When people started listening, the oil corporation bosses knocked him off.

In sum; if a citizen challenges ‘big money’ power brokers in Thailand, he/she can be killed and there will be scant follow up by law enforcement. Indeed, there are hitmen for hire throughout Thailand, and the going rates (and the hitmen themselves) are known to villagers – who accept it as another fact of life (and death).

Below is a list of 20 environmental activists who were murdered during the five years of Thaksin’s reign as PM. It’s doubtful that any of the assassins or the people who hired them have ever been formally identified or charged with murder, or as accomplices to murder. Influential and wealthy people are often behind murders-for-hire, and such people are untouchable in Thailand.

Here is the list, culled from the Nation newspaper;

1. Jurin Ratchapol: Killed January 30, 2001 because he took action against encroachments into a mangrove forest by influential people in Phuket.
2. Suwat Wongpiyasathit, leader of Rajathewa community: March 28, 2001: Was murdered after campaigning against a garbage disposal project that produced foul smells and water pollution. She was shot dead a day before she was due to speak to a Senate committee on the environment.
3. Narin Bhothidaeng, former chairman of Khao Cha Ang Klang Tung conservation group in Rayong. Killed on May 1, 2001 because he led villagers to protest a rock grinding plant run by a national politician.
4. Pitak Tonewut, former president of the Nature and Environment Conservation Student Club at Ramkhamhaeng University: Killed on May 17, 2001 because he led villagers to oppose the building of a stone mill that encroached on a forest conservation area in Nakhon Sawan province.
5. Chaweewan Peeksungeon, Nakhon Ratchasima’s Naklang Tambon Administrative Organisation (TAO): Killed June 21, 2001 for obstructed the bidding for construction projects by the TAO which favored local wealthy and influential people.

6. Somporn Chanapol, leader of Kradae river basin conservation group in Surat Thani: Killed July 2001 for protesting a dam construction project that obstructed the Kradae river.
7. Kaew Pinpanma: killed in April 2002 over a land dispute in Lamphun province.
8. Boonsom Nimnoi: killed in September 2, 2002 because he protested the construction of a chemical factory in Petchaburi's Baan Leam district.
9. Preecha Thongpan: September 27, 2002: Was shot dead after campaigning against a wastewater treatment project in Nakhon Sri Thammarat's Tung Song district.
10. Boonrit Charnnarong: Killed December 15, 2002 because he protested against illegal logging by forestry officials in Surat Thani's Tha Chana district.
11. Boonyong Intawong: Killed in December 20, 2002 because he protested against a rock grinding plant run by a local influential figure in Chiang Rai's Wiengchai district.
12. Khampan Suksai, deputy chairman of the Ping River Basin Conservation Group: February 1, 2003: Killed when he tried to prevent an important person from encroaching into community forests.
13. Chuan Chamnarnkit: Killed February 4, 2003 because he campaigned against drug use in Nakhon Ratchasima.
14. Samnao Srisongkram, chairman of Pong river conservation club: Killed May 25, 2003 because he protested against a paper mill.
15. Somchai Neelapaijit, human rights lawyer: Last seen on March 12, 2004: Kidnapped and killed by government agents because he was the defense attorney for five Muslim militants suspected of involvement in the January raid on an Army base. He also was defense attorney for three suspected Jemaah Islamiyah terrorists, and was involved in cases against a proposed gas pipeline in the South.
16. Chareon Wataksorn: Killed June 21, 2004: Led successful campaign against building of power plant at Bo Nok. Filed petition with interior minister and National Counter Corruption Commission accusing wealthy people of bribing local administrative organization officials to agree to sale of a 53rai plot of land. In 2001, he had received an honorary doctorate degree.
17. Luechai Yarangsi, president of an environmental group in Lampang, was shot but survived.
18. Boonsom Nimnoi, a community leader opposing a Phetchaburi plantation, was killed in September 2002.

It's a sobering list, not least because most of the murdered activists were bright young university graduates – and also because they were all protesting peacefully. A decent thing to do would be to erect a memorial to acknowledge their sacrifices. Have each murdered

person's name shown, along with their hometown's name and a brief mention of their cause. In Thailand, if a woman wears a spaghetti strap blouse, or if a farang is caught tossing a cigarette butt on a trash-strewn Bangkok sidewalk, she can be fined. In contrast, a wealthy contractor who hires a hitman to knock off a young person – is left untouched. At worst, the hired thug may get a reprimand, but the big boss ordering the hit is essentially untouchable – even if the whole community knows his identity.

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2. Feasibility Study with Foregone Conclusion

EGAT announced near the end of 2007 that they are allocating 138,000,000,000 baht (over 43 million dollars) to conduct a feasibility study to see whether nuclear power plants are the best option for generating Thailand's future electricity needs. To add legitimacy to the study, they got the Thai government to form a proxy entity called Nuclear Power Development office (NPDO) to stand alongside. Since EGAT is a government enterprise, it's run differently than a corporation. One of those differing ways is to allocate vast amounts of money for a campaign to produce a foregone conclusion. Actually, it's similar to what a private corporation would do, though a corporation would call it 'marketing,' whereas EGAT calls it a 'feasibility study.'

"Building a nuclear power plant is unavoidable for Thailand."

EGAT governor Kraisi Kanasuta.

Tara Buakamsri, a Greenpeace campaigner, says, "Amongst many fast-tracked decisions taken by the erstwhile military-government, the approval of 1.38 billion baht to study nuclear power generation by Mr. Piyasvasti Amranand (former energy minister), on his last day in the office, is a huge waste of money and will not adequately address the real issue of energy security."

Those in the highest echelons of Thai government want nuclear power. They've already expressed that desire unequivocally. The reasons are manifold and will be discussed later. The point here is that the allocation of 1.38 billion baht is a complete waste of taxpayer/ratepayer's money, because it's earmarked for a result that's pre-ordained. Actually, much of the money will get spent on high quality printed brochures which will likely be distributed nationwide. Another sizable portion will get spent on TV and radio ad spots.

Why all the expensive brochures and TV spots? The answer: To convince the Thai public that nuclear is the best option to meet Thailand's future electricity needs. To get an idea of how easily the general Thai populace is swayed by publicity: Just after the turn of the century, there was a nationwide election. One party spent gargantuan amounts on printing slick campaign posters which they hung everywhere. Nearly every one of the millions of concrete power poles throughout Thailand had a poster hanging from it (which is technically illegal, but who cares when the hanger is rich and powerful?). The other party had a much smaller number of posters hung.

Guess who won the election? It's a no-brainer, the party with the steamroller campaign won handsomely.

One party made all sorts of promises, having to do with forgiving debts, and offering nearly free health care. No matter that when that party won, the debt forgiveness plan went awry and hospitals closed for lack of funds. All that mattered was saying what need to be said to get elected.

One party had a giant campaign that paid village headmen to pass payments down to voters. Some observers say that the vote-buying was the most effective policy of all – and it certainly cemented the well-funded party's avalanche of votes. The nuclear 'debate' within Thailand will involve money also – lots of it - and there's no mystery who will have the most baht to spend to pursue their agenda.

Where does the money come from? The 1.38 billion baht for the 'feasibility study' which EGAT (**Electricity Generating Authority of Thailand**) is allocating to the newly formed NPDO (Nuclear Power Development Office)? Perhaps that's a two or three pronged question. For starters, how much is Thai government (taxpayers), and how much from EGAT's rate-payers. It's not from corporate coffers because EGAT is not a private corporation, so the 'feasibility study' will be paid for by the public, either through taxes and/or through higher electricity bills.

EGAT won't ask corporate bidders to contribute to their campaign to market nuclear, at least not openly. Since the money EGAT will be spending is government money, then there's scant incentive to get creative with the financing of their 'feasibility study' or any other expenses. Plus it takes more effort to solicit cooperation from outside corporations, and EGAT would likely rather take the course of least effort.

If EGAT's proposed 'feasibility study' were really looking at the feasibility of nuclear, it would, by definition, look at other electricity generating options. There has been, and will continue to be some lip service paid to some alternatives, yet the conclusion is foregone – the boys at the top all want nuclear, so any mention of alternative options will be like window dressing – in order to make it appear they're being objective.

Update on this topic, winter 2011

The data below was garnered from the web site:
<http://rbdweb.nstda.or.th/rbdweb/download/1-Nuclear.pdf>
and is the conclusion of EGAT's feasibility study:

Thailand's Nuclear Power Plants Feasibility Study
Thai Professionals Conference (TPC 2010) / Monday, June 5, 2010
Apisit Patchimpattapong, Ph.D. - Nuclear Engineering Division
Electricity Generating Authority of Thailand (EGAT)

The study concludes that Nuclear Energy Production for Thailand will be;

>>> reliable

- >>> low and stable cost
- >>> no greenhouse gases emissions

Results of a survey taken among Thai citizens, gauges what % of those questioned would approve of nuclear power development:

- in Thailand 64 / 32
- in their province - 32 / 59
- In their community - 24 / 66

Feasibility Study by Burns and Roe Asia, Ltd. (Oct 2008 - May 2010)

Dr. Kurujit Nakornthap, Deputy Permanent Secretary, Ministry of Energy, Thailand

Here is one succinct quote which was included in the study:

"Nuclear power has an excellent safety record"

Source: H-Holger Rogner, Head of Planning & Economic Studies Section, Department of Nuclear Energy, IAEA, 2010

The report goes on to mention: "At present, Public information program to promote nuclear energy is being developed by Subcommittee on Public Information and Public Participation and EGAT's working group on Public Communications. TV/Radio ad campaigns (including use of recognized Thai personalities on talk shows, etc), mailings (e.g., with electric bills), websites, newspaper and etc are considered as the effective media tools to communicate with the public. The program contents include the benefits of providing future electrical generation i.e. economic benefits (competitive cost of electricity), reduced green house gas emissions, and greater security of supply."

Ken's note: in other words, a greater publicity campaign needs to be waged by boosters of nuclear power in Thailand, including using celebrities to appear on mass media campaigns.

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Eight months before Japan's Fukushima was breached, Thailand's EGAT published a summary of their 175 million baht 'Feasibility Report' for whether Thailand should go nuclear. The whole thing, of course, was a farce, as the recipient (Burns and Roe Asia, Ltd.) of that money knew beforehand what Apisit Patchimpattapong PhD and other heads of EGAT wanted to see. The actual money agreed upon could have been 200 million, with EGAT heads possibly pocketing the difference. The public won't know unless there's an inquiry.

The overall summary of that report states: "Nuclear power is reliable, low and stable cost, and emits no greenhouse gases."

I wouldn't be surprised if Thai ratepayers/taxpayers, who are partial owners of EGAT, bonded together to slap a class action lawsuit against EGAT and Burns and Roe - claiming malfeasance in their collusion on that expensive bogus report. That 175 million baht was a clear waste of money by a public owned Thai company - on a ruse that fooled nobody. 'Malfeasance' is a strong word, but applicable in this case, as it

means, "an act by a public official that is legally unjustified or harmful to his constituents." If EGAT goes ahead and builds the five nuclear power plants it wants, then 'harmful' will be too soft a word for what might happen if one or more of those plants were commandeered and/or breached.

Source: Bangkok Post's Postbag, April 17, 2011

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175 million baht is an interesting number. When Thai government authorities dole out large government contracts, there are rarely finalized numbers like 175. It's more likely the amount offered was 200, but somehow 25 million baht 'got lost in the shuffle'. Was there 25 million Baht paid 'under the table' to the prestigious US nuclear engineering firm which was chosen (via a no-bid process) to write the report? Us little people will never know, because if there was a bribe, it would have been covered up and denied as much as possible, by 'the powers that be.' And don't expect any investigation on the matter.

When the head of Thai Tourism (TAT) got in trouble for accepting bribes (for allegedly enabling a US couple to arrange a Cinema Festival in Bangkok), it was US authorities who broke the story. Thai authorities didn't even know there were improprieties involved, and wouldn't have pursued an investigation or compelled any Thai VIP wrongdoer to face justice for something like that. Similarly, the Thai representative to FIFA was accused of cruising for a bribe for his vote on which country would host the World Cup. Would Thai authorities have unearthed that transgression? No. After it was alleged, would Thai authorities be expected to investigate and/or pursue disciplinary action against the alleged perpetrator? No.

This is Thailand, where 'face' rules, and 'mai pen rai' is the watchword.

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3. Which Sites?

Part of the 1.38 billion baht will supposedly get spent on deciding where the four best sites are for building nuclear reactors. This is obviously a sensitive issue, because even out-of-the-loop Thais acknowledge that there are safety concerns with nuclear. However, if jobs are on offer, then safety concerns will likely take a back seat. In other words, if a site were picked that was near X village, and the residents of X were convincingly told there would be lots of jobs on offer, then it's quite likely that most residents would look upon the new plant favorably. Thailand is a country in flux. It's easy to move from one area to another. So even if a resident of X had worries about living in the shadow of a nuclear reactor, she might not mind moving elsewhere.

EGAT and the NPDO, with their government money and backing, can both be expected to carry out a splendid publicity campaign. It wouldn't be surprising to see popular music bands and celebrities brought to the town, and heaps of great publicity for nuclear get offered to residents of village X and surrounding regions.

Nor would it be surprising to hear about under-the-table pay-offs to village headmen, promises of public work improvements, and perhaps even direct payments to villagers. All Thai politicians know how affective such actions have been for political campaigns, so it's only a slight adjustment to apply such skills to boosting nuclear power plants.

For practical reasons, all nuclear sites will have to be near copious supplies of water. The water will be needed for cooling the reactors. Salt water from sea can be used indirectly, though there are environmental drawbacks. The water being pumped in will have to be filtered, and the powerful non-stop pumping action, in and out, will have adverse affect on sea life. Clam and barnacle eggs could get through the filters and bollox up the pump, the valves, and piping systems. The zebra clam came to America's Lake Michigan in the ballast of a tanker. The ensuing problems with clam-infested municipal and factory pipes has caused damages there in the billions of dollars.

Thailand has many Km's of coast, including a few islands. Some islands and stretches of coast are obviously not on EGAT's short list. Anywhere near Krabi, Hua Hin, Phuket, Chon Buri/Pattaya, the Samui region, and other islands are very doubtful – because of their high density and/or tourism.

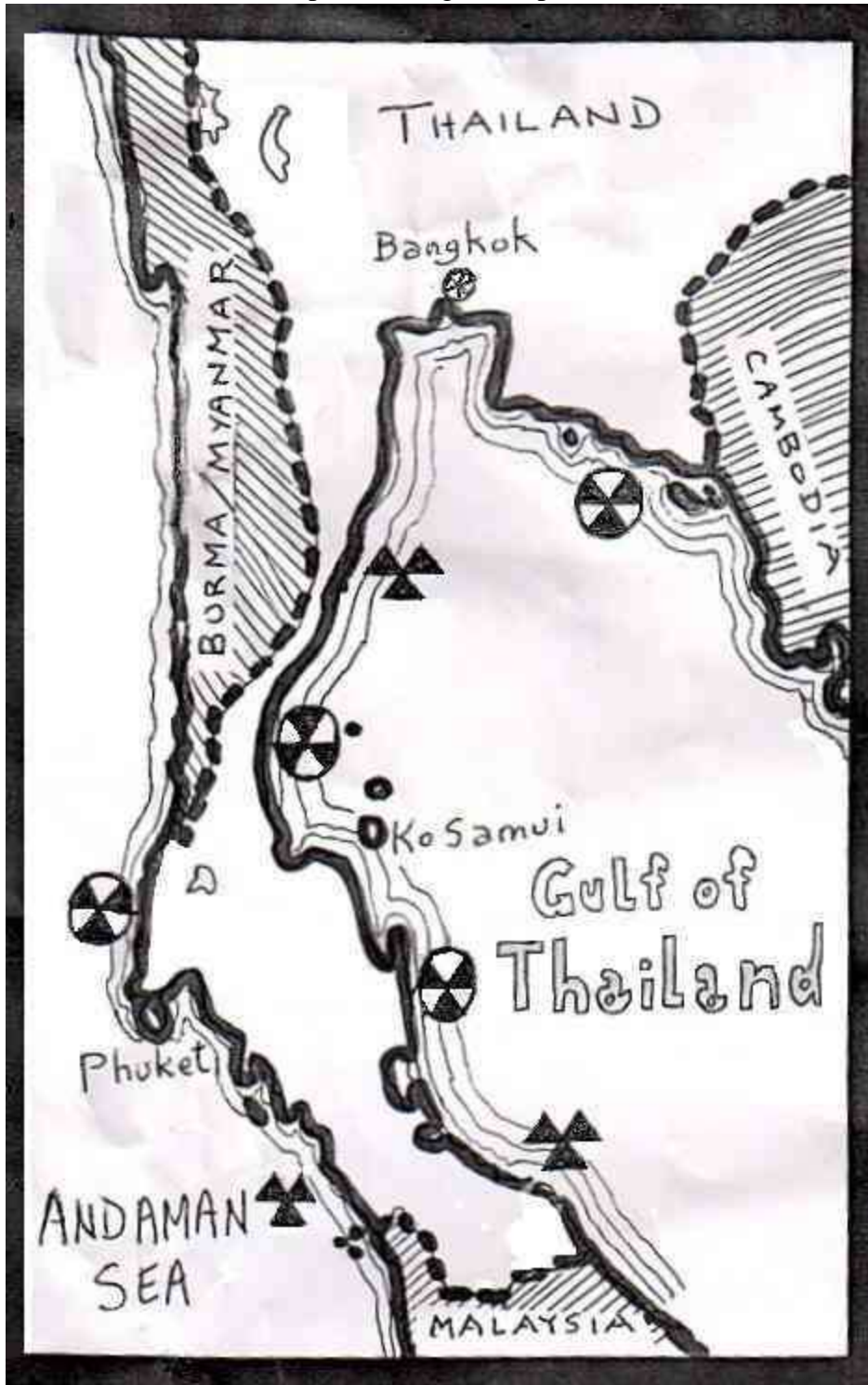
Much of Thailand's coast stretches along the far south region, yet that is also where there are festering problems with Muslim extremists. Rule that area out because of concerns for security. Extremists have been targeting anything and anyone who is even remotely connected with the Thai government. Teachers, street sweepers, coast guard piers, telephone booths – essentially anything that has the garuda state seal - is fair game. What juicier target than a nuclear power plant for those bent on causing trouble for government?



Much of Thailand's coast lies close to neighboring countries. It's doubtful that Cambodia, Malaysia or Burma would be warmed by the idea of having a Thai reactor planted near their fence line. Looking at Thailand's Andaman coast; its southern region meanders on down to Malaysia (and Islamist separatists) and the northern coast stretches near to Burma. The middle region is largely saturated with tourist destinations. Add to that, the new-found awareness of tsunamis and earthquakes, and that could preclude Thailand's entire Andaman coast from hosting any nuclear power plants.

Thailand's much longer coast around the Gulf of Thailand also has many similar impediments to building even one, let alone several nuclear power plants. Between its most southern region and the Samui area is the Buang Lagoon by the city of Songkla – which might be a proposed site – though it's still relatively close to areas of southern unrest.

The northernmost part of the Gulf of Thailand is called the Bight of Bangkok on some maps. It's bordered by land that includes Hua Hin, Pattaya, and of course; Bangkok itself. That whole region is out of the question as a site for a nuclear reactor - not only because of high populations, but also because there are at least two royal residences in that area.

*** unofficial map – showing lower part of Thailand ***



	indicates a less likely site for a nuclear power plant
	indicates a more likely site

After eliminating the coastlines which have drawbacks for consideration, there is scant little coast left to plausibly site a nuclear plant. There is a 300 Km stretch going north/south between Hua Hin and Suratani/Samui – though much of that region hosts tourist towns – and none is more than 50 Km from Burma. Indeed, some middle parts of that beach line are only about 15 Km from the Burmese border – so it harkens back the issue of whether Burma will take kindly to a Thai nuclear reactor within shouting distance of their territory. Also, a major railroad line and highway go through that narrow corridor. A nuclear problem there would be akin to smashing the knee of a one legged man.

If the tables were turned, it's doubtful Thai authorities and their military masters would give a warm welcome to the idea of having Malaysia, Burma, Laos or Cambodia build nuclear power plants within 15 Km of their border.

The only other tenuous possibility is the 150 Km stretch of coast southeast of Bangkok between Sattahip and Trat. Much of the same concerns crop up, namely: resort towns (Ko Samet, Ko Chang, Chantaburi and Rayong, to name a few) and proximity to a foreign country (Cambodia). Residents of Rayong have been in the news recently as protesting polluting factories, so they've shown themselves to be environmentally aware and prepared to mobilize with protests – if need be.

If EGAT opts to site a nuclear plant alongside a lake, then surely protests will ensue – not least because water rights are a sensitive issue in Thailand. Along with annual flooding which affects many parts, there are also annual problems with droughts. Every year there are new and on-going protests that revolve around lack of water. Having power plants commandeering lakes or stretches of rivers is bound to elicit howls of protests from farmers and homeowners.

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4. Get Informed

As we all know, a few years ago, Thailand's Andaman coast was hit by an unexpected tsunami. The word 'unexpected' is used here, because if you had asked any Thai person, even their top scientists, what were the chances of a tsunami hitting the Andaman coast – before the big one hit - nearly every one would have said zero or close to zero. Those 'in the know' would have told you that tsunamis are very rare in the Indian Ocean – and in recorded history, no tsunamis have ever threatened Thailand's shores.

Indeed, before the recent big tsunami, all but a handful of Thai people didn't even know the word 'tsunami'. When taking on such a serious technology as nuclear fission, awareness of potential threats should be a key component to planning process. Thais are certainly familiar with such things as flooding and drought, just as they know much about Bangkok and Thai history. But ask the average Thai to describe a glacier or to name two cities in any one of their four bordering countries, and you're likely to draw a blank.

That's why a rounded education of what's involved with nuclear power plants is so important at this juncture in Thailand's history. It's not enough to get just the glossed-over campaign that EGAT with their hired celebrities will parade out. People need to see the whole picture – before they are able to make informed and wise decisions.

Even EGAT doesn't see the whole picture. Or, if some of their people see it, they surely don't want to share their ideas with others. If an EGAT employee knows that going nuclear is his employer's foregone conclusion, what good would it serve for that person to buck the trend and declare that something like 'concentrated solar' looks to be a much better power option? Such a person would be ridiculed at the least, probably ostracized and lose his job – and may even get knocked off – pow! Thai assassins have been hired to kill for less serious reasons than that.

A few years ago, an accountant from Australia was hired to come to Thailand to do an audit of a rice mill which appeared to be cooking the books. On his way to the mill, he got shot and killed. Recently, a Thai doctor and her friends were all gunned down while having a friendly little barbecue in the back of her house. The reason; some neighbors thought the music was too loud.

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5. Where There are Big Contracts, There are Big Pay-Offs

Consider this hypothetical situation: There are two types of electricity generating options under consideration by authorities: All the components of each are identical. However, one of the options entailed big lucrative contracts for the builders, whereas the other option was cheaper all-around. Guess which one would be picked? If it happened in Thailand, the option with the big contracts would be chosen. There are several reasons for this, but the biggest reason is money. That's the primary reason why the plans to build four nuclear power plants are being railroaded toward implementation with such vigor by the 'powers that be.'

Before, during, and after their expensive 'feasibility study,' EGAT (and everyone else who might a piece of the tens of billions of baht on offer) will be only singing praises for nuclear. They're not stupid, and they know there will be concerns by some for safety, security, environmental, and fiscal issues. So they're lining up their marketing campaign to address those issues in quite convincing ways.

They will start by emphasizing Thailand's future needs for electricity. That in itself is not a contentious issue – though EGAT and others are addressing it from just one angle. For starters, EGAT's projected numbers are not realistic.

<p>Witton Permpongsacharoen, who is secretary-general of the Foundation for Ecological Recovery asserts the following; "Thailand does not need nuclear power. The purported "need" is based on an unrealistically high power demand projection</p>

and an unjustifiably small amount of real alternatives allowed in the PDP 2007 (the official 15-year power development plan). Last year, actual energy consumption grew 3.3% compared to the projection (by EGAT) of 6.14%. The government's forecast of future power demand is more than double the past 15-year average of only 914 megawatts per year.”

In contrast, Thailand's nuclear proponents paint a picture of ever-increasing demand for electricity. Besides the fact that nobody knows for sure what the future will bring, there are some related issues that beg to be mentioned.

First off, there's rarely a mention of conservation, except for the offhand mention of greenhouse emission related to global warming. That's what's called a 'canard' or a 'red herring.' Although nuclear plants don't emit carbon when powered up, they do have a carbon footprint. Just one of many ways that nuclear plants contribute nightly to CO2 emissions;

Mining requires very heavy machinery. Just one mine in Australia released the following numbers regarding the amount of diesel it will need to get through the top layer of rock – in order to access the ore it seeks: Roxby Downs estimates it will take one million liters of diesel per day for four years – that's nearly 1.5 billion liters of fossil fuel just to get through the top layer of rubble. After that, they'll need billions of additional liters of fuel to actually mine and process the ore they're aiming for. So, next time of someone tells you that 'nuclear emits no CO2, or has 'no carbon footprint,' you can look them in the eye and tell them 'that's hogwash!' ...and tell them why. [thanks to Roger Beaumont of the Nation Newspaper for passing that info along].

And to say nuclear doesn't emit carbon, while obfuscating the more dire issue of radioactive waste, is like telling your child to not spill her soup on the floor, while you're draining the used oil for your car on the same floor.

EGAT in particular, and nuclear boosters in general don't seem to realize that the #1 best way to deal with energy shortages in the future, is to encourage Thais to conserve energy. Perhaps it's understandable that EGAT skirts that issue, as it's in the business of selling the stuff, so why should it encourage people to buy less of what it sells? A similar sort of outlook might explain why President Bush was never a keen enthusiast for alternative power options in America. After all, for generations, his family had become rich selling Texan oil.

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6. Some Nuke Related History

Does the name Hans Blix ring a bell? He was the Swede who was appointed by the UN to head a committee to look for 'weapons of mass destruction' in Iraq, prior to America's second Gulf War. Well, roughly ten years before, Mr. Blix, as director of

the UN's International Atomic Energy Agency (IAEA), came to Thailand. His mission at that time was to convince the Thai government that nuclear energy was a good way to meet its future power needs. He told his eager listeners, "In the longer term it is inevitable and indispensable to use nuclear power and therefore any developing countries with fairly high levels of development, like Thailand, must begin to prepare for a nuclear period."

EGAT heads and the Thai generals in attendance appeared to agree heartily with his recommendation. Soon after, EGAT formed its first 'feasibility study' which lasted three years and came forth with a projected cost of \$1,430 per kilowatt. [Note: current estimates for large-scale solar generated electricity are as low as 1 baht per Kw – but more details of that later].

The UN's IAEA's stated purpose is to ensure safe use of nuclear – especially as regards possible weapons off-shoots. The IAEA was not designed to act as a booster for nuclear – particularly in lieu of the fact that there is no UN agency that promotes alternative energy options.

Soon after Blix's promotion and EGAT's per/Kw numbers, (produced by a Japanese consulting firm with ties to nuclear contractors), the World Bank issued a paper which strongly advised Thailand against building any nuclear plants. The bank's report concluded that relying on natural gas, even if it had to be imported in liquefied form from Indonesia or the Persian Gulf, would be cheaper for Thailand than nuclear energy. It also estimates that nuclear power will cost Thailand \$3,000 or more per kilowatt - 200 percent higher than the EGAT figure of a few months earlier – and many times higher than estimates for solar costs.

The following article is taken from a May 2008 syndicated newsletter written by Roy Wasson at **RenewableEnergyFund.net** based in Miami Florida, USA

Kevin Bullis in the MIT Technology Review predicts that the silicon shortage that has kept solar energy expensive is ending, paving the way to widespread expansion in PV system usage worldwide.

Mr. Bullis goes on to say; "Solar electricity is about to get much cheaper, industry analysts predict, because a shortage of the silicon used in solar panels is almost over. That could lead to a sharp drop in prices over the next decade, making solar electricity comparable in price to power from the grid."

Solarbuzz CEO Mike Bradford; says; "Crystalline silicon has long been the staple of the semiconductor industry - but it's also the active material in the most common types of solar panels. While only 15,000 tons of silicon were available for use in solar cells in 2005, by 2010, this number could grow to 123,000 tons, "What that means, practically, is that solar module prices are going to come down dramatically in the next three to five years,"

Bradford goes on to predict that over the next five years, production of solar panels will double each year. In a recent presentation, he said that prices for solar panels could drop by 50 percent or more – between 2007 to 2010.

In areas that get a lot of sun, that will translate to solar electricity costs of under 10 cents (3 baht) per kilowatt hour which will make large scale solar affordable.” Bradford concludes by saying; "You can't even begin to imagine the transformation that that's going to create."

During the latter part of the 20th century, no new nuclear power plants were ordered in North America. Similarly, Canada's Ontario Hydro cancelled twenty planned nuclear plants. What did they know that Thailand didn't know? Perhaps their policies had something to do with North Americans have had decades more experience than Thailand – in the nuclear power plant arena.

It's no wonder that nuclear power plant manufacturers, like General Electric, became concerned. With the help of the IAEA and people like Blix, nuclear industry focused much of their marketing might on prestige-seeking Asia. Despite the marketing pressure from big players in the industry, there are currently less reactors in operation today than five years prior. There are also less plants under construction that ten years ago.

The U.S., which was the pioneer in nuclear power generation, has not had an order for a new nuclear plant in the past 20 years. Why is that so? It's not for lack of development funds. The reason is the American people, who have been directly acquainted with nuclear longer than the citizens of most other countries, have realized that the drawbacks of nuclear power outweigh its benefits. Indeed, the U.S. is one of the few places in the world where functioning nuclear plants have been decommissioned.

Bikini Atoll, a remote little island in the Pacific Ocean, was used by the U.S. military about 60 years ago, to test atomic weapons. The handful of residents were moved off the island beforehand. They have no possibility of returning to their home island any time soon, as the radioactivity remains too intense.

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7. Peaceful Ways to Assert The Will of the People

There are peaceful ways citizens of some countries can over-ride the wishes of their governments and large corporations. In other words, if a large and determined group of people decide to enact a policy shift, they can do it. They do it via a combination of free press, peaceful demonstrations, and the ballot box.

Such avenues that enable the will of the people to override government policy, or to challenge big business don't exist in most countries. For example, in China, it's currently near impossible for a popular peaceful movement to affect change. Same for Burma, North Korea, parts of the former Soviet Union, and most of Africa. Thankfully, a country like Thailand does not have as much entrenched control apparatus as China, and the other countries mentioned in the prior sentence. Yet true

democratic avenues to change still have a ways to go in Thailand, as it remains a stratified society.

However, Asia governments' attraction to nuclear has not abated. Below are listed several reasons why nuclear continues to appeal to Asian governments;

>>> Nuclear has a prestigious aura about it. It's not necessarily joining 'The Nuclear Club' in terms of the mightiest weapons, but it's a 'Nuclear Club' nevertheless – and gives the appearance of modernity and of being technically adept .

>>> With a few exceptions (Japan, Singapore come to mind), Asian safety standards are not as strict as Europe or the U.S – thereby making big construction jobs easier – by having comparatively lax standards.

>>> Organized protest movements are more difficult to get going – and are often brutally squashed at their inception. Besides some smaller countries, where protests are nearly impossible (Cambodia, Vietnam, Burma, Laos), even a large country like China suppresses protests with an iron fist. Partly for that reason, China has more nuclear plants on order than any other country – 30 at last count.

>>> Most Asians have grown up accustomed to having directives given from a patriarchal top echelon. Non-conformity is frowned-upon. In other words; the government decides the flavor of the month, and its citizens better accept it, or suffer consequences.

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8. Yellowcake is not a Kid's Treat

Yellowcake is refined uranium (U_3O_8) that is the fuel for a nuclear reactor. Most of the world's uranium is mined in one of five countries: Australia, Canada, Namibia, South Africa, and Kazakhstan. Which ones will Thailand purchase from?

Mined uranium comes in several forms, or isotopes. For starting a nuclear chain reaction in a reactor, the only useful isotope is uranium-235, which accounts for just 7 out of 1000 atoms in the mined product. The other isotopes are useless except to tip armor piercing bullets and missiles. In other words, once the uranium is freed from the sand and rock, it will initially need to be refined to get the 0.07% that's useful.

Several further steps of processing are still needed – to get the ratio up to 0.5%. This is done by separating isotopes in an enrichment process that achieves the higher concentration. That's when you get Yellowcake. If there's a glitch in any of the many steps of that process – no yellowcake comes out the other end of the conveyor belt. Compare that, to what's needed to process the fuel for solar generated power. No contest. Just low-cloud daytime skies, and you're generating power.

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