

Decentralized Energy in Thailand: An Emerging Light

Thailand's power sector is struggling with contradictory development models. Plans to increase Thailand's dependence on large polluting fossil-fuel power plants and hydropower schemes that will endanger the region's rivers are being countered by good policies to promote clean, decentralized energy. The outcome of these competing models could determine Thailand's ability to meet the major challenges of a changing climate and the protection of critical natural resources.

Chris Greacen and Sheila Bijoor of the Thailand-based group *Palang Thai* suggest reforms that would help Thailand realize its great potential for clean, renewable energy and give independent, decentralized energy producers a real chance to compete with the big energy monopolies.

First – the good news. Clean, distributed generation is much easier to build, operate, and integrate to the Thai grid than it was before.

Thailand's foray into distributed generation began in 1992 with the passage of regulations that allowed grid interconnection of small-scale renewable energy and fossil-fuel fired combined heat and power (CHP) generators up to 90 megawatts (MW) in size. As of March 2006, this Small Power Producer program had contributed nearly one gigawatt (GW) of renewable energy capacity to Thailand's total peak load of 21 GW. If efficient decentralized CHP fossil fuel plants are also included, this figure increases to 4 GW.

Furthermore, in May 2002, Thailand was the first developing country to adopt net metering regulations (known in Thailand as the Very Small Power Producer Program) that provide streamlined interconnection arrangements for even smaller renewable energy generators under one megawatt in size. In the first four years, 13 MW were connected to the grid through this program. The law was recently revised to qualify projects up to 10 MW in size. These regulations provide higher rates for renewable energy, meaning that investors may find that

smaller, cleaner projects are better investments by offering lower risk, fewer headaches and higher returns than large-scale centralized generators. Initial response to the "10 MW VSPP" program has been good, with 34 new generators signing up with plans to generate 181 MW.

In 2003, the government set a target that 8% of all commercial energy would come from renewable energy by 2011. In 2003, the Thai Ministry of Energy estimated that Thailand's potential renewable energy resources exceed 14,000 MW. To put this in perspective, Thailand's total installed generating capacity in 2006 was 26,457 MW. The Government has also recognized the need to improve energy efficiency. As of March 2006, Thailand's Demand Side Management program had reduced peak electricity demand by just over 1,300 MW.

Vested interests and a poor planning process

Despite these positive signs, Thailand's power planning process still strongly favors investment in new centralized, large-scale power plants. It begins with forecasting. Thailand is notorious for overestimating future electricity demand; since 1993, 12 out of 13 forecasts have predicted demand that failed to materialize. The forecast is prepared behind closed doors by the Thai Load Forecast Committee, which bases it primarily on economic growth forecasts from a research institute that is funded by the state's three electric utilities. Inflated demand forecasts have created a false sense of urgency to build new power plants and resulted in overinvestment, the cost of which is ultimately borne by Thai consumers.

One reason for the chronic overinvestment is that the utilities actually have a built-in incentive to overestimate power demand. Their profits are set according to a "cost plus" structure, in which profits are stipulated by the government to be equal to



This biogas digester produces 500KW for a Thai farm.

Photo: Eppo

a certain percentage of the total expenditure. This system provides an incentive for heavy investment in electricity infrastructure, even if it occurs at the expense of consumers who pay unnecessarily high tariffs. Furthermore, the cost-plus incentive scheme gives the Electricity Generating Authority of Thailand (EGAT) little incentive to promote energy efficiency because it earns less money when customers save energy. As one Thai energy activist put it, "To have the utilities' profits tied to how much they spend is really backward. It almost seems like an Enron kind of situation." Citizens' groups are pushing for the establishment of an independent regulatory authority to help curb some of these abuses. Currently, Thai utilities are largely self-regulating.

Another problem is that EGAT is also responsible for developing Thailand's Power Development Plan (PDP). The PDP is decided in a closed, non-participatory process, much like the electricity load forecast. This is problematic because the utility's core business is building and operating big centralized power plants. EGAT controlled 47% of the electricity generation market share in 2006 as well as owning and operating Thailand's electricity transmission network and acting as the single buyer of electricity in Thailand. This raises a conflict of interest, as it presents EGAT with an economic incentive to restrict access to the transmission network for other independent power producers.

Exaggerated demand forecasts and EGAT's monopoly position have led to the creation of PDPs that focus on large, EGAT-owned (or

Distributed Generation: Generally small-scale electricity generation that occurs at or near the site of ultimate consumption as opposed to most electricity, which is large-scale and generated at a remote site and transported by long-distance transmission lines to the consumer. Advantages of distributed generation can include reduced losses through transmission systems, greater overall efficiency of fuel consumption, reductions in disruptions to electricity supply, and greater ease in electrifying areas far from the grid.

EGAT subsidiary) centralized fossil-fuel plants and large hydropower imports from Burma, Yunnan and Laos. The most recent PDP includes 4,000 MW of nuclear generation by 2011. The heavy respiratory-health burden borne by local communities affected by coal-fired power stations means that coal plants are strongly opposed by local communities. The development of large domestic hydropower schemes has been equally controversial over the years, leading EGAT to look to develop new hydropower projects in neighboring countries where community opposition is stifled. Despite the fact that small consumers, such as residential and small business customers, comprise 98% of all electricity customers in Thailand, they have no representation in the planning process.

Remarkably, the software used by the Electricity Generating Authority of Thailand (EGAT) to develop the PDP is configured only to select among large coal, gas, fuel oil, and nuclear projects. Because hydropower projects are site-specific, they are not part of this software system. Rather, the decision to build hydropower is considered separately – on a basis that is as political as it is technical – and hydro projects are added separately to the PDP. Moreover, the PDP only considers capital and operating costs – not social and environmental costs, fuel price volatility, or the impacts of different options on the costs of delivering electricity to consumers. By ignoring the environmental and social costs of electricity production and distribution, Thailand is using a false accounting that will come back to bite it in the long run. The trend globally is to recognize and incorporate these costs.

Reforming the power sector

According to the latest PDP, over the next 15 years, Thailand's total generating capacity is set to increase from 28,535 MW in 2007 to 58,351 MW in 2021. Of this, most will be centralized fossil-fuel powered plants, 5,091 MW will be power imports, mainly generated by hydropower, 4,000 MW will be nuclear, and a mere 1,253 MW generated by decentralized generation (mostly fossil-fuel powered with a minority portion of renewables).

A number of studies by the Thai government, the World Bank, and Thai utilities have established that Thailand has significant potential for a variety of clean, cost-effective, decentralized power options. Using the comparatively conservative figures in these studies, and by adjusting the demand projection to a more realistic level, Thailand could readily meet its future growth in energy demand through a mixture of energy efficiency/demand response (saving electricity is almost always cheaper than building new power plants; Thailand could save an estimated 4,260 MW through such programs), much greater reliance on renewable energy (we recommend an increase of almost seven times official estimates), and decentralized combined heat and power generation. CHP significantly reduces overall fuel consumption by building power plants at scales and in locations where the "waste" heat they produce can be used productively; at least 1,700 MW could be installed under this timeframe.





None of these options are radical. Distributed generation accounted for more than a quarter of electricity generated by new power plants globally in 2005, and is the fastest growing trend in electricity. Distributed plants are generally faster to build than megaprojects – leaving less time for reality to diverge from forecast expectations, thus reducing the risk of overbuilding. And decentralized alternatives typically produce power where and when needed, reducing the burden on the grid. Thai energy efficiency programs have already saved several power plants worth of electricity, at a fraction of the cost, yet despite great potential for more savings, such programs play only a minor role in the current PDP.

An ever-strengthening movement of civil society organizations and

community groups are calling for reform of Thailand's power planning process. They are advocating for an integrated resource planning (IRP) process, as applied in the USA and Europe, which is a true least-cost planning framework. In IRP, demand-side management and clean decentralized energy competes on an equal footing with conventional centralized energy plants. Electricity infrastructure investments are chosen based on the criteria that they provide reliable electricity services at the lowest overall economic cost to society (including social and environmental costs as well as risk), rather than the lowest commercial cost to investors. Major decisions are made through a process that includes informed, rigorous and meaningful public participation. A competent, fair, and independent energy regulator would oversee the process.

Sadly, Thailand's most recent PDP adopts a non-transparent, business-as-usual approach that largely ignores the significant contributions that energy efficiency, combined heat and power, and renewables could make. Yet, with Thailand's multi-gigawatt renewable energy potential and as-of-yet unexploited energy efficiency measures, Thailand stands in a good position to adopt a truly sustainable and secure power system... someday. ■

For more information: www.palangthai.org. Download a Greenpeace report that gives a green model for Thailand's energy planning: <http://tinyurl.com/38y5u3>

Resource		Potential
	Biomass	7,000KW
	Solar PV	>5,000KW
	Wind	1,600KW
	Micro- & Mini-hydro	700KW

Thailand's renewable energy potential, as estimated by the Thai Ministry of Energy (2003).