

Analysis of Thailand's electricity planning process and demonstration of integrated electricity planning

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During the 1990s, when Thailand's EGAT built the controversial Pak Mun dam, it also began a successful energy efficiency program that it estimates as having saved 1613 MW (9300 million kWh) as of 30 September 2008. But during the next decade and a half (2007–2021), EGAT and Ministry of Energy planners declare that Thailand needs more large central power stations, and increasing quantities of imported electricity (EGAT 2008).

Does Thailand possess clean, efficient, electricity service delivery options—options that are perhaps overlooked or marginalized by the official planning process? This Report (Foran 2008) introduces integrated electricity resource planning (IRP), demonstrates how it might work in Thailand, and reviews governance challenges. IRP is a form of comprehensive options assessment. In this assessment, demand-side and supply-side options are given balanced treatment, with the objective of investing in the least-economic cost first. IRP can be done for energy and for water resources.

Who typically does IRP and in what context? Since IRP requires engineering and economic data, utilities typically do it. In North America they have been required to do so by strong regulators. IRP has not always been popular: during the 1990s, the belief that privatization makes detailed planning unnecessary prevailed. IRP can be designed as an integrated, participatory assessment, and in recent years a number of independent analysts have called for Thailand to initiate such a process.

As an input to such a process, the author asked *How much electricity (kWh, MW) from large stations could be avoided if Thailand were to attain its 'practically achievable potentials' in (1) energy efficiency (2) renewable energy and (3) CHP (combined heat and power)*. The timeframe for the analysis was 2008–2018 (plus 2008-2027 for renewable energy). 'Practically achievable potential' is a subset of commercially viable potential. It is an estimate, which suggests the need for dialog between different informed actors. Indeed, the analysis was intended to start useful conversations rather than state definitive answers.

The author took the Thailand power development plan (EGAT 2008) as a reference scenario. According to this reference case, electricity demand grows at 5.5% per annum from 2007–2021, and Thailand needs a total net new supply of 30,413 MW.

For each of the options: energy efficiency, renewable energy, and CHP, the author conducted literature review, and in the case of renewable energy, used a spreadsheet model to explore the effect of different financial parameters on rates of RE investment.

Based on applications submitted to the Ministry of Energy as of April 2008, but not yet included in the PDP, a near-term potential of 3023 MW exists for renewable energy and natural-gas CHP. Based on literature review (e.g., du Pont 2005; Foran, du Pont & Parinya 2006), the author estimated medium-term (that is, by 2018) achievable *energy efficiency* at 1366 MW savings. For *CHP* over the medium term, the estimate is 1382 MW. This is 30% of the potential among a set of existing Thai buildings which Gvozdenac et al. (2006) screened as technically suitable for CHP. For *renewable energy*, under a policy with base tariff set to 3.34 THB/kWh, plus a feed-in tariff equal to the current rate offered to Thailand's three Southern provinces, a total of 2142 MW renewable energy could be developed within 20 years. The estimates of achievable potential by 2018 sum to 4890 MW.

Adding the near-term potential with the medium-term potential, a conservative estimate of the 'clean domestic' options achievable by 2018, but not yet in the PDP, sums to 7912 MW (~33,000 GWh).

The figures that Thailand will actually achieve depend on successful implementation of Ministry of Energy's energy efficiency measures in commercial and industrial buildings, as well as on enhanced tariffs for renewable energy. Results depend on participation by the private sector, thoughtful incentives, and political commitment to more transparent and open planning. By simplifying power system planning, the analysis aims to start productive conversations about more sustainable options for meeting electricity services, and what can be realistically achieved.

The Report includes historical and institutional analysis. It is currently available in Thai (Foran 2008).

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