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**Thailand's Politics of Power System Planning and Reform**

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# 1 Introduction

Long before the first charge of dynamite was set on the bed of the Mun river, before Pak Mun dam closed its gates and the Assembly of the Poor rose to prominence, Thailand's most controversial hydropower dam existed as an abstraction, as a series of numbers, drawings, and equations that coalesced to establish it as the least-cost option to expanding peak-demand electricity supply in Thailand.<sup>1</sup>

My purpose in this paper is to chart and explain changes in the politics of electricity supply planning, from the self-regulation era of the 1960s–1970s, to the period of increasing inter-agency scrutiny that began in the late 1980s, through to the current period of open challenge to planning practices by Thai civil society actors.

*I ask: What patterns exist in Thai electricity supply planning and politics? What roles do knowledge and knowledge-brokers play in conflicts over policy formation? By what mechanisms has a civil society “sustainable energy” network attempted to influence planning practices and policy, with what outcomes, and what emergent consequences?*

Electric power system planning is a social practice that produces an expert knowledge discourse. Planning practices are not well understood by generalists. They rely on discourses difficult to access in terms of both standing and specialization. Their premises are often not questioned by experts. On the other hand, planning practices also include simple assumptions and beliefs that prove to be vital in buttressing political positions. Understanding how this combination of lay and expert discourses has been deployed and challenged addresses the question of what role knowledge plays in policy making.

Since the early 1980s, states worldwide have undertaken various forms of energy sector privatization. In the 1990s in Thailand, there have been countervailing pressures from civil society for social and environmentally friendly reform, particularly after the financial crisis which erupted in 1997. Both pressures continue as of this writing, in the context of the Thaksin administration's attempt to privatize EGAT, and resistance from the EGAT union and civil society.<sup>2</sup> Pressure to maintain the status quo from EGAT's union has produced a fascinating political dynamic

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<sup>1</sup> Pak Mun was commissioned in 1994 against significant local and trans-local resistance, which continued for another decade (Foran 2006).

<sup>2</sup> In other countries, e.g., India, civil society mobilization occurred earlier (Dubash 2002).

where competing agendas have been voiced, including a “sustainable energy” reform agenda.

However, Thailand’s electricity planning, and its overall industry structure, impede sustainable energy futures. By sustainable energy I refer broadly to a suite of renewable energy sources, energy conservation, and deliberative and participatory processes. Along with the historically closed planning processes, a small sustainability agenda can be detected among Thai state agencies, including initiatives to increase renewable energy and energy efficiency (C. E. Greacen 2005a).

Third, regarding knowledge and policy, civil society and state experts wielded distinct and competing knowledge discourses. The political dynamic in the most recent period has not been (solely) one of state vs. civil society, but rather polarized struggle combined with less visible but equally important cooperation. Hajer’s (1995) concept of “storyline” is a useful heuristic device for mapping the narrative content of these differences (Foran 2006: chapter 2). However, to gain a finer-grain understanding of actual knowledge/policy dynamics it needs to be supplemented with Keck and Sikkink’s (1998) concept of advocacy networks.

My fourth and most important argument is that the structure of planning matters as much as the structure of the industry as a whole. In Thailand, the political agenda has been dominated by concern and conflict over the future structure of the electricity supply industry: what mix of private ownership, what degree of vertical integration (e.g., Amranand 2003). This “privatization debate” distracts from what I see as an equally important concern of who gets to plan and strategize, and how.

Although planning practices are embedded in and shaped by the prevailing industry structure, nonetheless, reform advocates can isolate the planning problems, both analytically and pragmatically. One can have privatization without planning reform, and vice versa. Civil society advocates know this. Yet for reasons partly beyond their control (having to do with the power of discourse coalitions) privatization has monopolized public discussion, resulting in a truncated and inadequate planning reform debate.

Following an overview of the structure of Thailand's electricity supply industry, I survey contemporary power system planning, providing the reader with a sense of the expert knowledge discourse that has come to be contested by civil society actors. I trace the trajectory of the dominant electricity supply-expansion agenda, and

compare it to the broader agenda of integrated resource planning (IRP; Swisher et al. 1997) that asks how to manage rising demand by overall least- economic cost planning, including investments in energy efficiency.<sup>3</sup>

EGAT's Power Development Plan (PDP) emerges from a closed planning process that begins with a national load forecasting sub-committee and ends with approval by the Cabinet. The process has extremely limited civil society participation, no oversight by parliament, and limited participation by other stakeholders of. Of all the agencies involved, EGAT plays a major role in shaping the details of what appears in the PDP, particularly plant size, fuel source, and location. These conditions prevailed in the 1980s, at the time Pak Mun was identified as a potential addition to the Thai power system. They prevail today. The continuity surrounding the PDP process is remarkable considering the dynamism surrounding EGAT. The paradox is partly explained by the fact that most of the attention put on EGAT and the energy sector during the past decade has been couched in terms of the social costs and benefits of *particular* plants, and in terms of privatization.

To their credit, EGAT and other agencies have given increasing attention to the concern of how to supply energy services in a manner that is cost-effective and environmentally sensitive. However the incentive structure still discourages more significant investment in energy conservation. I conclude by describing recent attempts by civil society advocates to reform EGAT and the power system planning process.

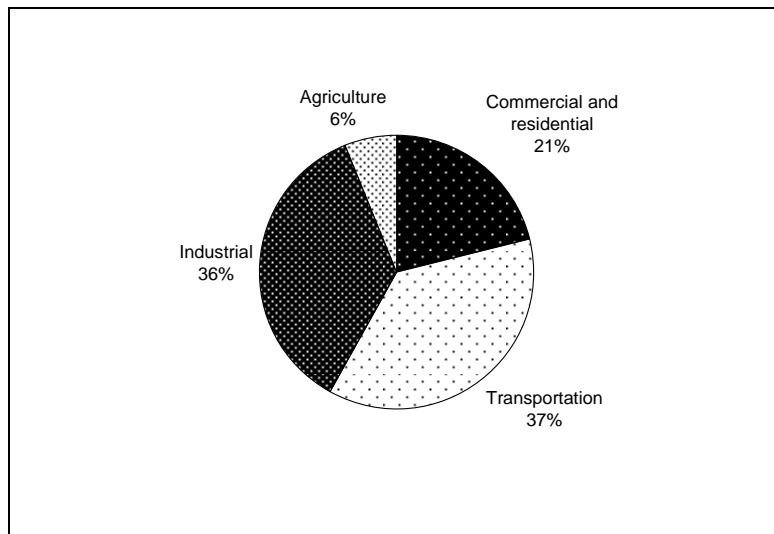
## **2 Energy sector and industry structure**

Figure 1 shows Thailand's total primary energy consumption. About twenty percent of total primary energy use is for electricity generation. Thailand consumes one million barrels of oil equivalent per day (0.75% of world consumption) (Lertsuridej 2004). Figure 2 shows the composition of energy sources used in electricity generation. Thailand first began to generate electricity in 1897, for limited public consumption in Bangkok. During the 20th century, the dominant source of

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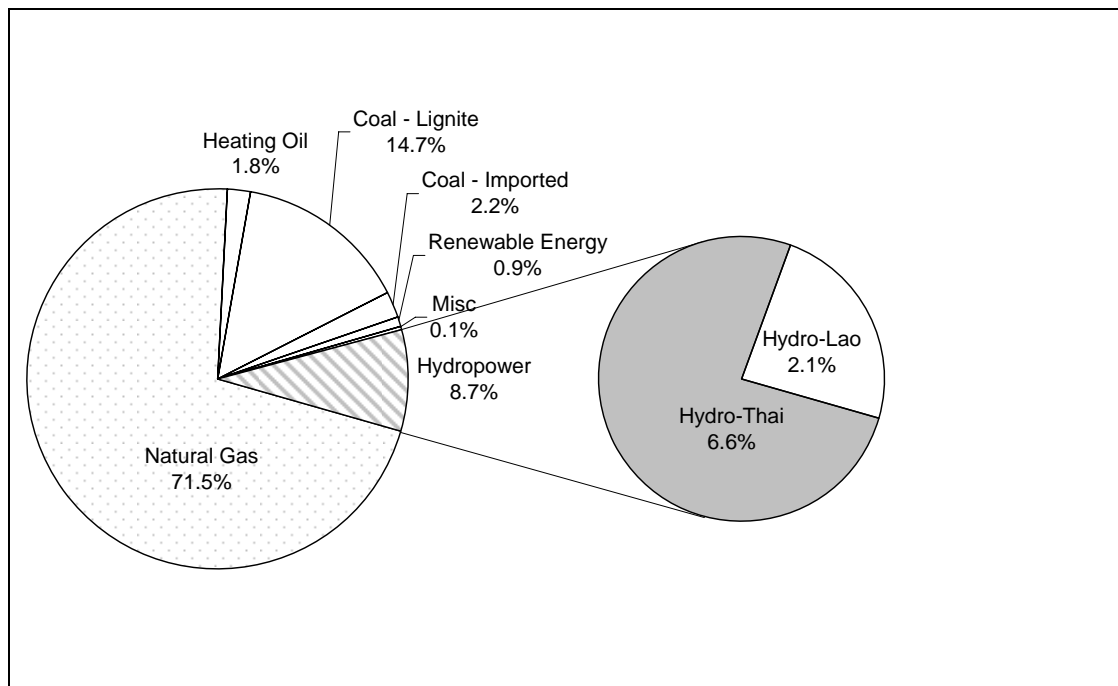
<sup>3</sup> The IRP framework is comprehensive enough to include quantifiable social and environmental costs.

**Figure 1 Total primary energy consumption by end-use sector**



Source: Lertsuridej (2004).

**Figure 2 Proportion of electricity generated by different fuel sources**



Source: data from EGAT (2003).

energy shifted from wood, to imported fuel oil, to lignite coal. High-polluting lignite remained dominant (e.g., from Mae Moh, the nation's largest coal plant, in Lampang) until the discovery of natural gas in Thailand in the early 1980s led to new gas-fired plants.

The overwhelming share of natural gas in the fuel composition has led to policy debates, initiated by NEPO, the National Energy Policy Office, in the 1990s. Figure 3 shows the projection of peak power consumption over a 15-year planning horizon (EGAT 2003). Planners project the annual peak will occur in April, the last month before the southwest monsoon arrives, and a month of school holidays. The need to supply enough power for instantaneous peak demand periods drives new capacity planning. In Thailand “peak demand” is defined as the top 15th percentile, that is, the year's top 1,314 hours of demand. In 2003, the difference between the maximum power demanded, and average demand during the rest of the year, was approximately 26.5 percent (EGAT 2004a). Figure 3 also shows how reliability (in the form of a socially-constructed margin between supply and demand) is built into forward planning.

Figure 4 depicts the structure of the electricity supply industry and shows how Electricity Generating Authority of Thailand, a wholly-owned state enterprise, is involved in production, transmission, and real-time system operation. EGAT was formed in 1968, joining Thailand's existing large power stations. In the past, EGAT had a monopoly on production. During the 1990s, as demand rose rapidly, the pro-market NEPO pushed EGAT to share production with private sector “independent power producers” (IPPs). EGAT's share of total generation capacity now stands at about 60%.

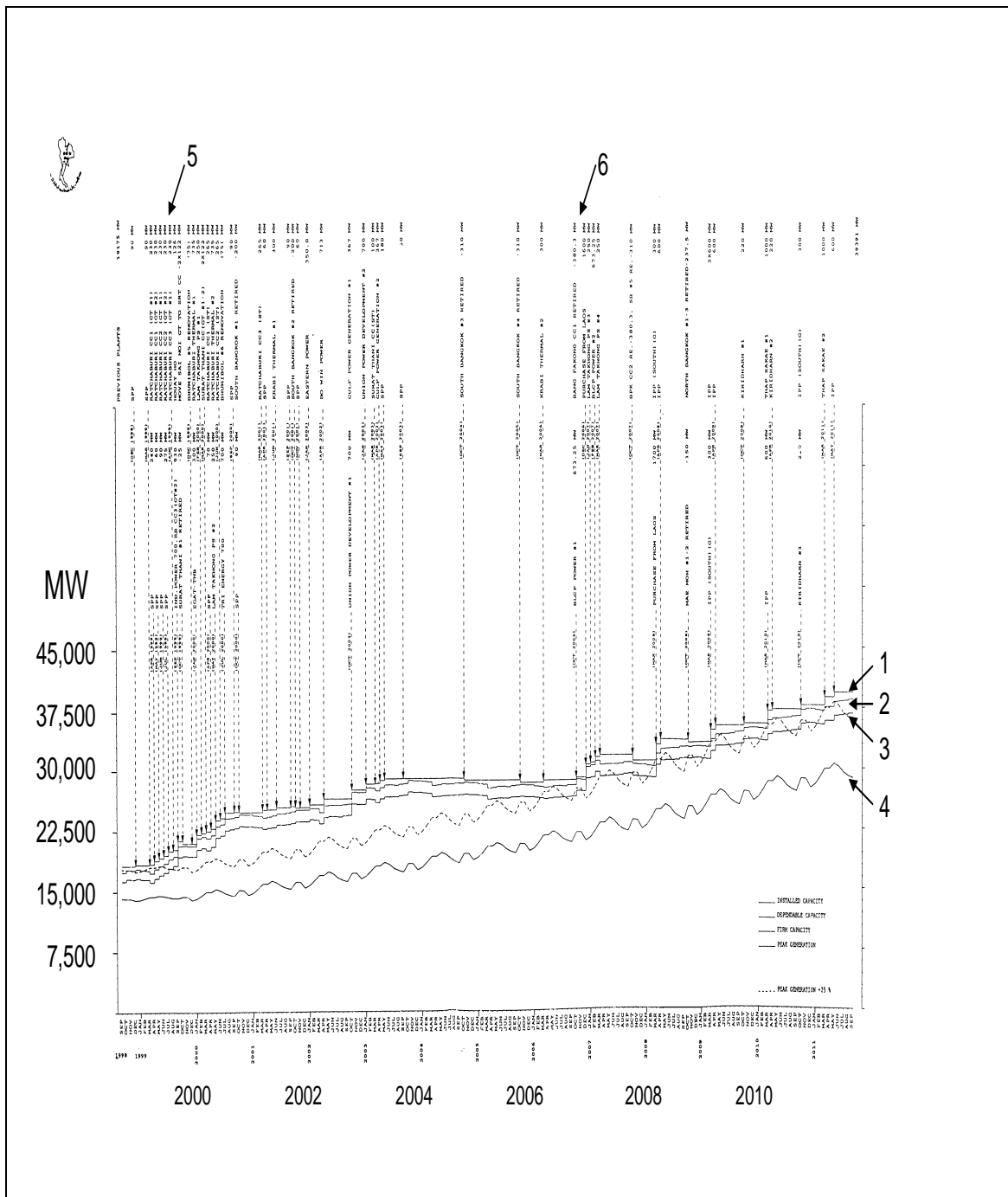
In 2005, renewable energy sources (rice husks, sugar cane residues, pig manure, wind, solar, and micro-hydroelectric power) from mostly private producers provided about 600 MW, or less than three percent of total peak power demand (C. E. Greacen 2005b). Private producers operating non-renewable, but high-efficiency natural gas co-generation plants provided another approximately 1,700 MW (Suvit, interview 22/9/04).

During the past decade, interest in selling energy by small and very small power producers (SPPs and VSPPs) has grown, however their ability to negotiate access to the grid and entry to the market is dwarfed by the power EGAT wields as essentially the nation's single electricity wholesaler.<sup>4</sup> EGAT is a “cost-plus” (or “rate-

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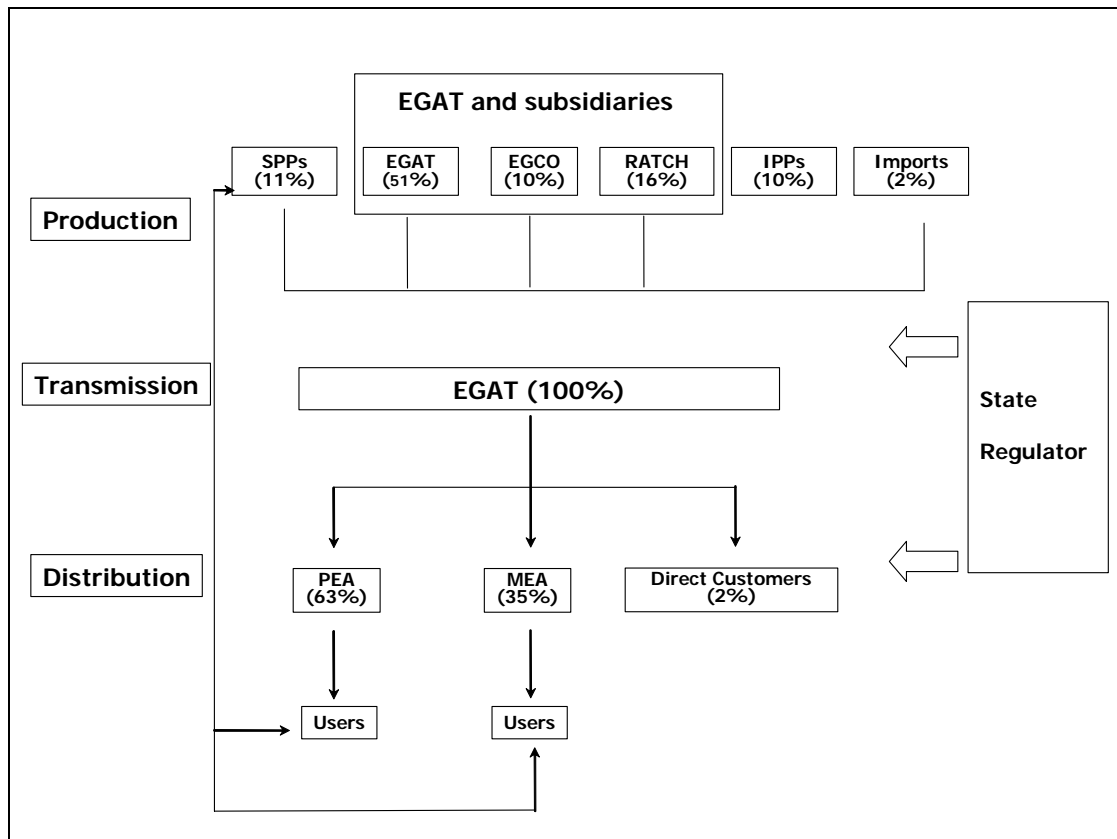
<sup>4</sup> SPPs are less than or equal to 90 MW in capacity; VSPPs are less than or equal to 5 MW. Direct sales to large industrial customers and some government agencies comprise only a small proportion of total sales, so EGAT is essentially a single buyer.

**Figure 3 Trajectory of power demand and supply**



Source: adapted from EGAT (1999). Lines (1–3) are forecasts of supply, in order of increasing engineering reliability: (1) *rated capacity*; (2) *dependable capacity* (% of rated capacity, based on historical performance of different power plant types; 85%–98% for fossil fuel plants); (3) *firm capacity* (total dependable capacity minus dependable capacity of two largest units in system). Line (4) is *demand forecast*. Dashed line = demand forecast plus 25% *reserve margin*. In EGAT’s formulation, firm capacity should not fall below dashed line. Arrows (5–6) indicate hydropower imports from Lao PDR: (5) Huay Ho (126 MW, 1999); (6) “generic” project (1,600 MW, 2006).

**Figure 4 Thailand's electricity supply industry**



Source: adapted from Witoon (2004).

base”) utility: it is guaranteed revenue to cover its costs plus a certain profit margin. While EGAT itself is currently 100% state-owned, it also has subsidiary corporations: EGCO, the Electricity Generating Company, and Ratchaburi Power Generation Company, which are owned in part by private shareholders. The overall image is of an agency invested with multiple duties and authorities (Table 1). One sees how multiple actors shape policy, and do so in the absence of an independent “regulator:” an institution that balances the needs of the electricity industry with an evolving public interest, for example, in reasonable tariffs and social and environmental safeguards (Throgmorton 1996; World Resources Institute 2004; see Section 3.1). Missing from the above structure, with few exceptions, is parliamentary review of major decisions. With this basic structure, Thailand resembles countries such as Indonesia, with the exception that

**Table 1 Jurisdiction over electricity sector policy-making**

<b>Duty:</b>	<b>Agency:</b>	<b>NESDB</b>	<b>MOF</b>	<b>MOEN</b>	<b>EGAT</b>	<b>MEA &amp; PEA</b>
Social policy		<b>x</b>		<b>x</b>		
Investment planning		<b>x</b>	<b>x</b>	<b>x</b>	<b>x</b>	<b>x</b>
Fuel type				<b>x</b>	<b>x</b>	
Demand forecasting				<b>x</b>	<b>x</b>	<b>x</b>
Rate setting				<b>xx</b>	<b>x</b>	<b>x</b>
Technical standards				<b>x</b>	<b>x</b>	<b>x</b>
Permission to build				<b>x</b>	<b>x</b>	
Generation					<b>xx</b>	
Transmission system control					<b>xx</b>	
Distribution / Retail						<b>xx</b>

Source: Witoon (2004). Notes: ‘**xx**’ indicates main responsibility; MOF = Ministry of Finance; MOEN = Ministry of Energy; MEA = Metropolitan Electricity Authority; PEA = Provincial Electricity Authority.

Indonesia leads Thailand in moves to create an independent regulator (Seymour and Sari 2002).

### **3 Thai planning practices, 1960s–1980**

This section begins a detailed examination of planning practices and governance. I focus on three concerns: Who plans? How do actors conceive and craft their planning practice, in terms of objectives, constraints, and methods? Third, how are Thai planning practices embedded in larger contexts of national and global economic change? I follow the history of planning practices, beginning when Field Marshal Sarit Thanarat courted large-scale U.S. development planning assistance for Thailand shortly after seizing power in 1957.

### **3.1 System expansion and “self-regulation”**

Modern power system planners address two interacting problems: estimating future demand (“load”) and figuring out how to meet that demand most economically. Critical issues include the options planners include as solutions to meeting demand. Do they look primarily at investing in new discrete power plants, or do they also look at investing in energy conservation through more efficient lighting, more efficient motors, and other programs? Table 2 below traces power system evolution in the U.S. and Thailand.

Immediately after WWII, less than ten percent of the Thai population had access to electricity, and lived mostly in urban centres. System expansion to meet a felt need for electricity was on the state's agenda. Energy conservation would not rise to prominence on any public agenda until the 1973–74 oil crisis (C. E. Greacen 2004).

When the World Bank completed its development mission to Thailand in 1959, it recommended, in line with its free market policy preferences, the closure and sale of most state enterprises and factories (Phongpaichit and Baker 1995). It exempted electricity supply and distribution – Bank planners in that era saw them as industries involving public goods and “natural” monopolies, hence best suited to a regulated utility model. Accordingly, EGAT was formed in 1968 to exercise unified control over Thailand’s main power stations (Bhumipol Dam and several lignite plants in the North and South), control previously decentralized to the regional/individual power plant level. By then, the Metropolitan and Provincial Energy Authorities had been distributing electricity to urban and rural customers for about a decade. As a regulated state-owned utility, EGAT would be required to serve the nation’s total demand for electricity. Customers, including the two retail electricity utilities, would pay EGAT for the cost of all these investments, including a modest return on investment. EGAT, the MEA, and PEA were structured as “cost-plus” utilities, the dominant organizational model at the time in the North (Greacen and Greacen 2004). It was a structure well-suited to a context of steady economic growth and expansion of access to electricity.

During the 1960s and 1970s, expanding population growth, a repressive labour regime, strong foreign investment, and tariff protections produced rapid economic growth in Thailand. Both manufacturing and agricultural exports grew by just under

10% per annum during the fifteen years spanned by Thailand's first three five-year national development plans (1961-1975).<sup>5</sup> EGAT's task was to prepare Power Development Plans (PDPs) that would support the economic growth envisaged in the national Plans. The PDP is a schedule of investments in new generating capacity – in other words, a schedule of additions to the system, driven by a particular electricity consumption forecast. As well, the schedule shows removals of power plants from the system for maintenance or decommissioning. The time scale involved is monthly, over a fifteen-year time horizon (Figure 3). The PDP includes cost data.

### **Governance issues**

A society might have strong incentives not to pay more for electricity than is reasonable, and not to invest in more generation capacity than needed. The first concern – paying excessively for supply – derives from the fact that electric utilities have near-monopoly control of production and distribution. High energy costs impede economic growth. The second concern – over-investment – arises whenever the utility has a cost-plus incentive structure. Over-investment diverts capital away from other investment priorities, leads to higher electricity rates (tariffs), and degrades more natural resources (IIEC 1991).

As an organization able to pass on its costs to its customers, EGAT does not have a particularly strong incentive to minimize its costs of production. Yet its over-investment eventually feeds back, indirectly, as higher capital costs for alternative investments. A second disadvantage (particularly relevant in today's context), is that overinvestment may lead to weakened competitive position vis-à-vis private sector suppliers. Such concerns have not been publicly articulated by state actors (cf. Amranand 2003).

During the 1960s–70s economic boom however, such governance issues were not on the agenda. If electricity rates were unacceptably high for rural households, then the solution was to subsidize rural consumers.<sup>6</sup> Overall, the key to containing the basic contradiction between the public's material interests (as captive consumers) and

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<sup>5</sup> U.S. planners advising the newly formed National Economic Development Board (NEDB, later NESDB) wrote the first three national plans (Phongpaichit and Baker 1995, Ch. 4).

<sup>6</sup> This was done by charging everyone within a given customer class a uniform tariff.

those of the cost-plus utility (as captive suppliers)<sup>7</sup> lies in appropriate oversight or “regulation” (World Resources Institute 2004; Throgmorton 1996).

**Table 2 Institutional change in power systems, United States and Thailand**

U.S.	Key projects / events	Thailand	Key projects / events
<i>From Introduction of Electricity–WW II</i>			
Explosion of interest in urban electrification for trolley lines, 1890s	Folsom Dam on American river supplies electricity 22 miles to Sacramento, 1895		
New Deal era: large federal dams promoted for power and irrigation in West	Hoover Dam Grand Coulee Tennessee Valley		
<i>Post–WW II</i>			
	1959 – Upper American River, (staircase of 11 major dams, 6 powerhouses, 24 miles of tunnels)	Late 1950s – urban and rural electrification grows	
<i>1960s</i>			
7–8% electricity demand growth forecasted by big utilities → interest in nuclear power as cheaper than fossil fuel	1963 – First nuclear power plant, 1963 (ordered by New Jersey utility, built by General Electric)	1969 – EGAT established; rapid system expansion; self-regulation	1960 – Mae Moh lignite-fired thermal plant (13 MW)  1964 – Bhumiphol Dam (548 MW)

<sup>7</sup> The utility is captive in the sense that it is expected to supply no less than the total quantity demanded. In return, the utility is granted a monopoly on bulk power sales.

(Table 2 continued)

U.S.	Key projects / events	Thailand	Key projects / events
<i>1970s</i>			
First and second oil crises: rapid economic growth in U.S. tapers. Parallel rise of post-War industrializing economies in Europe, and Japan, South Korea, Taiwan.			
<p>Electricity rates double in the USA</p> <p>Consumer campaigns to open access to regulatory bodies</p> <p>Milestone environmental legislation passed:</p> <p>National and California Environmental Quality Acts</p>	<p>California's regulator requires utilities to implement conservation programmes</p> <p>Several dozen new plants proposed</p> <p>Mechanisms for utilities to recover program costs developed</p> <p>1979 – Three Mile Island nuclear plant incident</p>	<p>Period of rapid system expansion, self-regulation</p>	<p>Major expansions to Mae Moh</p> <p>1971 – Sirindhorn Dam (36 MW)</p> <p>1972 – Chulaborn Dam (40 MW)</p> <p>1974 – Sirikit Dam (375 MW)</p> <p>1980 – Srinakharind Dam (720 MW)</p> <p>1984 – Vachira-longkorn Dam (300 MW)</p>
<i>1980s</i>			
	<p>1984 – utility energy conservation peaks in CA, then sharply declines due to insufficient incentives</p> <p>Nuclear accidents: 1985 – Rancho Seco; 1986 – Chernobyl</p> <p>1989 – Sacramento voters vote to shut down Rancho Seco</p>	<p>Self-regulation with increased scrutiny after creation of NEPO</p> <p>World Bank urges privatization of EGAT</p>	<p>4/1989 – EGAT submits Pak Mun Dam project for review by Thai cabinet</p> <p>9/1989 – IIEC conducts 10-day intensive energy conservation planning study tour for Thai utility managers</p>

(Table 2 continued)

U.S.	Key projects / events	Thailand	Key projects / events
<i>1990s</i>			
<p>1989–95 – Second wave of CPUC energy conservation reform in CA: <i>utilities’ profits tied to energy conservation performance targets</i></p> <p>1995 – CA electricity supply industry begins neoliberal restructuring; reduces DSM incentives; experiments with short-term contracts</p> <p>2000–01 Western energy crisis: price increases and blackouts caused by drought, underinvestment, and flaws in CA market design</p>	<p>Utilities such as PG&amp;E provide consumer rebates for energy efficient appliances</p> <p>After 1995 – decline in DSM investments</p>	<p>8.5% electricity demand growth forecasted 1990–2001; 9.8% growth rate forecast for large commercial buildings</p> <p>Utility energy conservation programs (DSM) launched</p> <p>Emergency borrowing post-1997 financial crisis renews World Bank and IMF pressure for privatization</p>	<p>4/1989 – Pak Mun Dam approved by Thai cabinet (136 MW)</p> <p>1990 – National Energy Policy Committee orders “DSM Master Plan,” World Bank funds Plan.</p> <p>1991 – World Bank approves Thailand 3rd Power System Project, including funding for Pak Mun Dam and Mae Moh scrubber installation</p> <p>11/1991 – IIEC completes Plan</p> <p>1993–97 – EGAT implements revised DSM plan</p> <p>1994 – EGAT commissions Pak Mun Dam</p>
<i>2000s</i>			
<p>2000s – revival of interest in renewables and IRP</p>		<p>2004 – Privatization attempt by Thaksin government backfires</p>	<p>2005 – Lao PDR’s Nam Theun 2 project (1,070 MW) approved by World Bank</p>

Principal sources: U.S.: Smeloff and Asmus (1997); Swisher et al. (1997); Northwest Power Planning Council (2005); Burr (2003). Thailand: EGAT (2000a); IIEC (1991).

What today's analysts call "good governance" meant, in that era, predicting and providing electricity to underwrite economic growth (C. E. Greacen 2004, Sukkumod, n.d.). The first agency that attempted to regulate EGAT was the National Energy Authority (NEA). The NEA had been formed 15 years earlier than EGAT, with a broad mandate to plan and regulate power generation. It once operated hydropower stations and regulated small-scale electricity suppliers throughout Thailand,<sup>8</sup> but its portfolio declined when the government transferred power plant operations to EGAT and allowed PEA, a rival utility, to craft the country's rural electrification policy. In practice NEA found itself unable to exercise significant oversight over utility planning:

By the 1970s . . . key decisions about where to build generators and wires [transmission lines] and how to operate the system were made by utilities themselves. The utilities refused to share key information with the NEA which would have allowed the NEA to effectively serve as a regulatory body. As it became clear that the NEA lacked data, analytical capability, and enforcement authority, the NEA became simply an energy data-collection agency . . . the three utilities (EGAT, MEA and PEA) were essentially allowed to self-regulate – with the exception of basic financial requirements set by the Ministry of Finance. (C. E. Greacen 2004)

These financial requirements followed World Bank guidelines to ensure the utility did not run out of cash and was able to service its debt. The first requirement was that EGAT finance 25% of any new capital investment, by increasing rates. The second requirement was that EGAT's income before interest and taxes exceed its current debt obligations by 50%.

The agency most able to constrain EGAT's "self-regulation" was NESDB. After approval by its Board of Directors, EGAT sent the PDP to NESDB for review, but the PDPs during that era did not receive any particular interest from the government. What mattered more was the budget for each discrete power plant proposed, which NESDB also reviewed prior to submission to the Cabinet. Although NESDB was meant to serve as a regulator, it felt to a newcomer that some staff people acted more like mouth pieces for EGAT, advocating for the utility's designs (interview, Dr. Wanchai, former planner 20/10/04).

Although EGAT's planning was indeed reviewed by a separate agency, in a

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<sup>8</sup> These took the form of private, municipal, and cooperative utilities, typically powered by diesel generators. The structure was not unlike Cambodia's current supply structure (C. Greacen, pers. communication).

context of rapid economic growth, the prevailing mentality was one of inter-agency cooperation to meet national development goals. Lacking power engineering analytical staff, NESDB's main contribution as a regulator would have been to certify the validity of the nation's electricity demand forecast ("load forecast"). During this period, EGAT took its forecasts from a "load forecast working group," a group composed of relatively low-level representatives from the three power utilities and NESDB, without specialist advice. The working group fitted statistical regressions with time (year) as the independent variable, and demand as the dependent variable, extrapolating future demand from the past data. Although planners now look upon at this method as "quite archaic," it sufficed in a context of a stable economic structure with agriculture at the base of the economy, in a context of predictable energy prices (interview, Dr. Prasit, former planner, 27/9/04; Dr. Wanchai, 20/10/04).

To sum up this era: the two and a half decades following the rise of national development planning (1960s–mid-1980s) were the "boom" period of electricity supply expansion. Lightly-regulated utility planners submitted system and project plans for approval, which readily ensued. The World Bank, through "concessionary lending," played a key role in securing the involvement of a variety of foreign lenders, which included Canadian, Japanese, German, and OPEC sources (Greacen and Greacen 2004). By protecting domestic manufacturing from foreign competition, national policy favoured industrialization, and utility sales benefited.

#### **4 Thai planning practices, 1980s–2004**

The next two and a half decades (1980s–2004) constitute a qualitatively different period of system and planning evolution. This busy and contested period begins with the second OPEC energy crisis. Following the Thai financial crisis it continues with institutional upheaval, more open debates on the future of EGAT, backlash, and vociferous demands from segments of civil society for expanded participation in shaping the electricity industry. In this section I review the effects of introducing energy conservation into utility planning. I also note the influence more incremental – almost mundane – refinements to planning practices have had on the politics of planning today. Choosing such a long period, however, requires that we first discuss the impact of "external" economic shocks on planning.

In 1981, the majority of lending for energy projects was by commercial banks,

as opposed to low-cost loans from World Bank and counterparts. Half of foreign credit to Thailand went to the energy sector (Phongpaichit and Baker 1995, Greacen and Greacen 2004). By this time, tensions had emerged. After the second energy crisis (1979–80)<sup>9</sup> newly tapped natural gas from the Gulf of Thailand began to flow. Thailand's fuel import bill nonetheless tripled, rising to 30% of all imports by 1982 (Phongpaichit and Baker 1995, Greacen and Greacen 2004). (Electricity generation would later switch to natural gas as its main fuel source, but Thailand continued to rely on fuel oil in the short term.)

By the 1980s agriculture, the mainstay of the economy, had suffered a decade-long decline in terms of trade. The low value of national exports, combined with high public debt (in large part to service the energy sector) threatened the government with a financial crisis, and the administration – rather like the Latin American nations experiencing similar conditions – responded by approaching the World Bank and IMF for credit. The Bank and IMF supplied the credit, but under the condition that Thailand conduct “structural adjustments” aimed at boosting exports and trade, reducing welfare-oriented subsidies, and allowing the private sector greater role in what hitherto had been state-owned enterprises. Electricity prices jumped two and a half times, but otherwise, what Phongpaichit and Baker describe as the Bank's “enormous pressure” for economic policy change otherwise resulted in minor reforms (1995: 148).

Labour unions and allied academics resisted this early attempt to privatize EGAT, but few would have been able to sense the sea change involved in the Bank's turn towards neo-liberal model of global economic development. The context in which such models emerged was that of rising oil prices, slowing growth in OECD countries, and popular and elite disaffection with big government in the U.S. and UK (Brenner 1998; Kingdon 2003). Weakened OECD growth triggered international banks to lend to large developing countries (such as Brazil and Mexico). However, when these debtors, faced with OECD protectionism and declining agriculture commodity prices, incurred debt and balance of payment crises, the stage was set for neoliberal structural adjustment policies, one component of which was cutting government expenditures and privatization (Hewitt 2000).

What consequences did rising energy prices and World Bank scrutiny have for

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<sup>9</sup> The period after production from revolutionary Iran fell and OPEC cut back on production, before its members broke ranks to sell more oil to the world.

Thai power system planning practices? Certainly, private investors did not take control of EGAT. However, other agencies, including the World Bank energy sector staff in Thailand, attempted to induce EGAT to approach its planning practices with more economic and accounting rigor: first, as a result of increased economic volatility and lower growth in the mid-1980s, NESDB appears to have increased its scrutiny of PDPs, and initiated requests for revisions.

During the period 1985–88, the NESDB sent six Power Development Plans – previously approved by the EGAT Board of Directors – back to EGAT for revisions. Two were eventually approved by Cabinet. The budgets associated with these PDPs differed by as much as 54.1 billion baht (\$US 2.16 billion). Each revision was triggered by the national Board’s preference for an alternative demand forecast. The Board helped select a new chairman for the load forecast working group. It also judged that the second forecast used techniques that were “not good enough” (EGAT 1992). This more assertive oversight was triggered in part by the entry of an energetic and talented economist. During this period, Dr. Piyasvasti Amranand began assisting NESDB reviewing PDPs. By 1986, the Oxford-trained economist headed a new regulatory agency, the National Energy Policy Office (NEPO) (Greacen and Greacen 2004). As a result of NEPO’s oversight and veto authority, both the load forecasts and EGAT’s PDPs became more detailed (Dr. Wanchai, interview 20/10/04).

Secondly, EGAT and other utility planners began to introduce a number of technical refinements to their practices. Table 3 summarizes these changes of practice, their potential implications, and the actual socio-political changes to date. Some of these changes – the advent of least-cost planning criteria, and of more detailed load forecasting – would have been initially welcomed by the World Bank and NEPO, but regarded disinterestedly by non-technical actors. Some refinements, while lying politically dormant for years, have the potential to catalyse further debate.

For instance, EGAT currently stipulates that its system should have 15% more dependable capacity than the expected annual peak power demand. This *reserve margin* – required of all generating systems – allows for planned and emergency power plant shutdowns. The size of the reserve margin varies by country and is a socially-constructed function of the maximum expected *unplanned* power outage (hours per year) deemed acceptable. EGAT’s however uses a rule-of-thumb-based reserve margin (currently 15%). The utility has never explicated its connection to Thailand's maximum expected unplanned outage level of 24 hours per year. However,

a more transparent *loss of load probability* (LOLP) analysis could replace rule of thumb selection of the system minimum reserve margin (Wang and McDonald 1994). Of course, the larger the reserve margin, the more generation capacity is required.

#### **4.1 The context of technical refinements**

What political and economic contexts enveloped these refinements? By the late 1980's the Thai economy was growing more strongly, thanks in part to an influx of foreign direct investment from Japan (Phongpaichit and Baker 1995). Demand for electricity rose even faster than GDP growth (EGAT 1993). Power shortages and rotating blackouts were common (Greacen and Greacen 2004). The World Bank anticipated that energy sales and power demanded would more than double by 2000 (World Bank 1990).

Faced with these prospects, EGAT in 1991 was planning to triple its generating capacity to 23,000 MW in 2006 (Busch 1991). The organization would need to spend approximately \$US 30 billion during the 1990s to finance this expansion. At the same time, EGAT's debt rose to uncomfortably high levels: 57% of its \$US2.04 billion budget went to servicing foreign debt (Greacen and Greacen 2004). During this period, with post-Cold War political détente in Thailand, and with bilateral aid, a current of support for sustainable development and environmental conservation emerged. The politics of new power plant construction became openly contentious. A small, yet ambitious segment of conservation-oriented NGOs clamoured to participate in policy discussions around specific controversial power plants, including the proposed Nam Choan and Pak Mun hydropower dams.

Yet EGAT's system planning discourse was becoming less accessible to concerned activists. By this time EGAT would claim that each new power plant was the "least-cost" alternative to rising demand. The data they showed NEPO and the World Bank would support this claim. The discussion would then turn to financial technicalities of putting a deal together. The case rested on these terms: that the need

**Table 3 Important planning practice refinements, 1980s–present**

<b>Practice</b>	<b>Prior Method</b>	<b>Refinement / [Source of Refinement]</b>
Load forecasting	<i>Macro econometric regressions</i>  <i>Expert choice between “high,” “low,” “medium” GDP growth scenarios</i>	Survey-based end-use modelling – household appliances, commercial floor space [supported by Canadian Institute for Development Assistance in 1991]  GDP projections by industrial sub-sector  Probabilistic scenarios [World Bank Nam Theun 2 analysis, see Segal (2004)]
Determining reserve capacity (total system dependable capacity minus system peak load)	Arbitrary methods:  <i>(1) System (minus two largest units) must meet annual peak</i>  <i>(2) Rule of thumb<sup>1/</sup></i>  25% (pre–1988) 15% (1988–98) 25% (1999) 15% (early 2000s)	Probabilistic standard: total power outages in system not to exceed a pre-determined national standard of 24 hr in one year. Requires <i>loss of load probability</i> (LOLP) calculations (= probability of demand exceeding supply during any one hour of the year).  Reserve margin can be derived from LOLP analysis and no longer needs to be set arbitrarily. LOLP requires detailed analysis of plant operating histories.

Sources: EGAT (1993b; 1999); IIEC (1991); interviews. Notes: <sup>1/</sup> Based on: [(total dependable capacity divided by annual peak) – (1), expressed as percentage]. Prior methods still used today in conjunction with refinements shown in italics.

was undeniable, given steady rising demand, and that the solution was the cheapest, given the available alternatives. The debate would remain constructed in narrow terms for outsider critics of Thai power planning, until a striking new policy initiative emerged.

#### **4.2 EGAT’s economic analysis and the rise of an electricity conservation agenda**

In 1991, the International Institute for Energy Conservation (IIEC), a technically-oriented NGO based in Washington D.C., with a three-year-old regional office in Bangkok, made a compelling case to EGAT and the government for a massive increase in funding for energy conservation. IIEC proposed that the three

utilities – EGAT, MEA, and PEA – spend 4.57 billion baht (\$US 179 million) to reach out and offer a suite of conservation programs to all categories of customer. Programs ranged from subsidizing more efficient lights and motors, to consulting services for architects planning new buildings. IIEC argued that:

The average long-term cost of these energy savings to the utilities is 0.49 baht per kilowatt-hour. When these costs are compared with EGAT's current long-term cost of 1.08 baht per kilowatt-hour to produce new electricity supply, it is clear that the least-cost investment for the utilities is in energy efficiency. (IIEC 1991: 2)

IIEC also argued that the ten-year potential for energy efficiency investments would obviate the need to build 2,000 MW of power plants, saving the Thai government 59 billion baht (US\$ 2.36 billion).

In order for IIEC to make these kinds of provocative arguments, the authors needed to know EGAT's long-run marginal cost. EGAT was willing to supply that figure, indicating good rapport, and an early display of enthusiasm for the concept of energy conservation. Equally important, EGAT was able to *derive* that figure – indicating the capacity for complex iterative computation.

Swisher and co-workers' *Tools and Methods for Integrated Resource Planning* (hence after, "IRP Manual") explains the importance of the long-run marginal cost for utility planning:

The principal goal of traditional power planning is to meet the projected demand for electricity at the least cost . . . [by determining] the least-cost plan for increasing the power supply capacity . . . The main cost criteria in an expansion planning is the revenue requirements, which must be sufficient to cover all utility costs and an acceptable return to investors. (Swisher et al. 1997: 129)

"Acceptable" returns refer to interest rates and other financial conditions negotiated between utilities and investors such as commercial banks. Traditionally, banks have been willing to lend to state-owned utilities at lower interest rates, because these loans are underwritten by governments. According to conventions in energy economics, the "revenue requirements" include both sunk costs that have not been fully depreciated (for example, Pak Mun Dam), as well as a suite of fixed and variable costs. The least-cost plan is a schedule of future investments:

These future investments should be discounted to their present worth [present value] to reflect the time value of money . . . and they should be compared

according to their *long-run marginal costs* . . . . the long-run marginal cost governs the planning of new resources . . . . In traditional power planning the least-cost plan should also have the lowest tariffs. (Swisher et al. 1997: 129–130)

To re-cast the discussion slightly: as utilities plan to expand supply, they can choose, in theory, from a number of different types of power plants. Note that expanding power supply cannot be done by running existing plants longer hours. To run existing power plant for longer would generate more *energy*. It would not solve the problem of consumers, system-wide, simultaneously turning on electrical devices. This occurs during specific periods of the day and year and is referred to as "peak demand." For all practical purposes, energy cannot be stored. Utilities need to supply the peak amount of energy demanded at any given moment.

Traditionally, expanding supply has meant building new power plants, as opposed to solving customers' demands for specific end-services (such as a 27° Celsius office temperature, or given level of illumination for a department store display). The utilities classify their power plants according to function: some plants run all year on low-cost fuel to meet what is called "baseload" demand, other plants can be fired up much more rapidly, and are used only to meet peak demand because their fuel costs are much higher, even if their capital costs are lower. Utilities planning to expand their supply must invest therefore in a portfolio of different technologies which have different costs. They must know in some fine-scale resolution how power demand fluctuates: typically they gather data on total system peak power demand for each one of the 8760 hours in a year. This enables them to graphically visualize demand, by constructing ranked plots of power demand throughout the year, from yearly maximum to minimum. Such plots are called "load duration curves."

In order for EGAT to argue that its long run marginal cost was the lowest (and therefore the least-cost system expansion plan) it had to construct alternative investments scenarios, with each scenario consisting of a suite of power plants together capable of meeting the system's load duration curve. EGAT would then have had to compare the costs of these alternative scenarios or plans. Although the fundamental principles of least-cost planning had been well-established by the mid-1980s, external actors such as NEPO and the World Bank appear to have increased pressure to comply and to refine that compliance.

### **4.3 Thailand's Demand Side Management Plan**

By 1991 IIEC was arguing that the least-cost way to meet rising demand for energy services was for the government to invest in energy conservation. By the end of its five-year program, peak power demand would be 225 MW lower than it would if EGAT proceeded under the status quo, with no energy conservation. (The rated peak output of Pak Mun Dam is 136 MW, by contrast.) Annual energy consumption would fall by 1078 GWh (compared to an expected 286 GWh from Pak Mun). Critics of hydropower projects seized upon these findings. It is well worth tracing the effects of IIEC's initiative on the politics of electricity planning in Thailand.

In late 1989, following up on a well-received conference on energy efficiency strategies for Thailand it organized the prior year, staff from IIEC persuaded ten Thai utility and other energy policy staff to take an intensive study tour of U.S. energy conservation programs (Cherniack 1989). Six months prior to this, EGAT had submitted to the Thai cabinet a summary report outlining the features and benefits of the Pak Mun Dam multipurpose project. By the time of the tour, the U.S. utilities hosting the Thai visitors already had more than a decade of experience implementing energy conservation programs, most of which they termed "demand-side management" (DSM) programs – which we can define as *an intervention into end-user behaviour, by the electricity supplier, in order to raise the level of energy services<sup>10</sup> supplied per unit of electricity produced.*

On both the West and East Coasts, the Thai visitors found electricity utilities reaching out to the end-user with an array of energy-efficient technology: lighting, air-conditioning, refrigeration. Utilities were also offering subsidies for construction of highly efficient commercial buildings (buildings that significantly exceeded the building code standards). Significantly, the visitors also heard repeatedly about “integrated demand/supply least-cost planning.”

For example, the California Public Utilities Commission stated that it was the first regulator in the U.S. to “recognize energy conservation as a resource for future power planning that could be treated on an equal basis with increasing energy supply.” Mark Cherniack, the IIEC study tour leader, wrote that “the growing trend of these [regulatory] commissions is to require some type of integration of demand-side energy efficiency programs into the overall power programs of the utilities they

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<sup>10</sup> Examples of energy services include illumination, or regulated temperature.

regulate; about half of the commissions . . . presently have such a requirement” (Cherniack 1989). Three months after the study tour, the Thai agencies had initiated new projects, including new energy-efficient buildings planned for the utilities themselves, and the reduction of import taxes on efficient lighting.

When IIEC submitted its *Demand Side Management for Thailand's Electric Power System: Five-year Master Plan* a year later, it was more than a technical document. Certainly, the Master Plan contained technical detail. For instance, it contained five budgeted programs, including efficient air-conditioners for new homes, (for which consumers would get a rebate); financial incentives to appliance manufacturers to improve efficiency; and assistance designing new buildings.

The Plan also recognized the need for organizational change. In order to deliver programs to diverse end-users, it called for setting up a new organization, the Demand Side Management Office, comprised of 110 staff drawn largely from within the three utilities. The Plan also argued for increasing the priority of energy conservation on the national agenda. It issued the following kinds of explicit advice to the National Energy Policy Committee<sup>11</sup> for action at different levels, for example:

(1) Strongly promote the message within the government, and to the public and private sector, that the DSM program is a national development priority which will improve the environment and create a more efficient and competitive economy. . . .

(2) Advise the Ministry of Interior that complete cooperation is needed from MEA and PEA [the two distribution utilities] to meet the DSM objectives. . . .

(6) Advise agencies that all new government buildings should meet or exceed the energy efficiency levels in the proposed building energy standard. (IIEC 1991: 56)

The Master Plan appeared to catalyze broader institutional involvement. In November, 1991, the same month IIEC submitted the final draft to the three utilities, the Thai cabinet approved its US\$ 179 million budget. The following year, EGAT, the agency nominated in the IIEC Master Plan to host the DSM office, had written its own five-year plan to be implemented beginning in 1993. EGAT's plan boosted the IIEC Plan's budget by \$US10 million<sup>12</sup> and its target for peak capacity reduction by about 6%. EGAT raised its targets for electricity energy savings by 32% (EGAT

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<sup>11</sup> The NEPC was formed shortly before the creation of NEPO in the mid-1980s.

<sup>12</sup> In addition to this amount, the Global Environment Facility provided a US \$9.5 million grant. The Japanese and Australian governments also provided US \$25 and US \$6 million respectively (Singh and Mulholland 2000).

1993b). The prominence of energy conservation on the national agenda appeared to have risen, with international actors both reacting to and abetting this process. What was implemented?

By 1997, year five of the DSM program, EGAT's DSM office had surpassed its own targets. Investments in energy efficiency resulted in 305 MW of peak power capacity avoided. Annual energy savings were 1,705 GWh. The utilities failed to meet some particular goals, but surpassed others. IIEC had anticipated that "the modest savings goals of 225 MW for the initial five-year program could be surpassed by dedicated utility effort." In any case, the international energy conservation community considered the program an exemplary case study (Swisher et al. 1997: 115). Careful technical analysis had laid the groundwork for significant conservation achievements.

#### ***4.4 The promise of integrated resource planning***

Notwithstanding these achievements, the promise of energy conservation to revolutionize energy planning has not been systematically explored by Thai utility planners. The promise held out by IIEC was that the power utilities could reach out, to hundreds of thousands of consumers nationwide – both households and commercial customers – and motivate them with consumer rebates and free consulting services to invest in energy-efficient technology. It was a decentralized alternative to traditional highly centralized electricity supply planning.

More importantly, the IIEC plan was very explicit about the economic potential of energy efficiency investments. It laid down a clear decision rule: "the plan recommends that the utilities pay for DSM measures with a cost of saved energy below 1.56 baht per kilowatt-hour." To elaborate, the Plan clearly demonstrated what investing "in the least-cost energy resource" meant. It computed the cost of energy conservation both in terms of the "cost of avoided peak power" (in baht per kilowatt) and the "cost of saved energy" (baht per kilowatt-hour).

The first cost is the cost of reducing peak power demand through energy conservation. IIEC calculated this to be 20,300 baht/kilowatt (the ratio of its total 5-year program cost divided by the peak power saved). By contrast, it stated that EGAT's cost of building a new lignite-fired plant (without emission controls) was 37,800 baht/kilowatt.

Similarly, to buttress its argument, IIEC cited how much it cost EGAT to

produce wholesale electricity (in terms of long-run marginal energy cost). That figure was 1.08 baht/kilowatt-hour. IIEC further argued that this cost needed to be adjusted upwards, because of transmission and distribution losses. For each unit of power consumed by the end-user, EGAT needed to generate 1.14 units to cover transmission and distribution losses. Since IIEC's programs reduced demand and hence did not require a reserve margin, IIEC argued that EGAT's marginal cost therefore needed to be adjusted upwards by 15% for a true comparison. Summing these two adjustments, IIEC noted that for 100 MW of delivered power, EGAT had to install 129 MW of capacity. Finally, IIEC argued that conservation programs did not generate pollutants. By contrast, the societal cost of these harmful emissions – although not recognized by Thai law at the time – should be added to EGAT's cost. It cited 15% as the mid-range of cost “credits” used by North American utilities (IIEC 1991: 2–3) when comparing DSM with conventional supply. Making all these adjustments, the societal cost of producing a unit (kilowatt-hour) of electricity was actually 1.56 baht. *This was more than triple IIEC's budgeted cost of saved energy, at 0.49 baht per kilowatt-hour, with no difference in level of energy service.*

In short, IIEC's proposal was an argument for “integrated resource planning” (IRP). This rather vague-sounding term refers to the systematic comparison of a suite of alternatives that meet demand for energy services. IRP emerged in the early 1970s following the first energy crisis. The heart of IRP involves generating technically viable<sup>13</sup> alternatives that are compared, ranked according to cost, and combined. In the case of energy conservation programs, which involve persuading customers to change behaviour, some assessment would need to be made as to the likely “market” response.

#### **4.5 Analysis: politics of Thai electricity conservation**

In Thailand, energy conservation analysis and proposals were crafted with enthusiasm beginning in the late 1980s, and competently implemented during the 1990s. And yet, by the beginning of the current decade, there is a distinct sense that energy conservation has not been systematically pursued to the limits of its potential. I can cite the following examples. An EGAT Power Development Plan from the early

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<sup>13</sup> Some energy efficiency programs, like ceiling insulation, reduce peak power demand more than others, such as installing more efficient air conditioners (IIEC 1991: 17).

1990s contains a clear introduction to IRP. The authors knew exactly what was entailed:

To integrate a DSM program as a candidate plant in the generation planning, the potential savings of energy and capacity as well as the hourly load pattern of electricity savings must be estimated together with the cost of the DSM program. This requires research into customer behaviour and response to utility initiatives such as program marketing and financial incentives. (EGAT 1993b: 37)

The following paragraph shows a palpable reluctance to consider DSM as a "candidate plant":

*There is greater risk to invest in the DSM programs than to invest in new power plants. Therefore unless the potential and costs of DSM program are confident [sic], effective IRP will not be achieved. . . . if the total savings of 238 MW and 1427 GWh hour per year by the proposed DSM programs in the Master Plan . . . are fully achieved, the quantity of the savings represents about 1.7 percent of the total peak generation requirements only and should be treated as extra power reserve margin [the margin between installed capacity and anticipated peak power demand] to the electric system. (EGAT 1993b: 37; emphasis added)*

Representing power or energy savings as quantities that should be assigned to a reserve margin (set by EGAT and NEPO at 25% or 15%; see Table 3) is not illogical. However, it undermines the purpose of IRP. Energy conservation specialists view efficiency programs as potentially able to *erase* portions of the reserve margin entirely, not fill them in. What is the difference between these two constructions?

The key difference is that the efficiency proponents, unlike EGAT, are willing to accept that energy efficiency can increase reliability, not reduce it. For example, in 1991, John Busch at Lawrence Berkeley Laboratory ran a "production-cost" simulation model to study the effect of alternative load scenarios (including energy conservation) on the operation of the Thai power system. He used engineering models, comparable to those used at EGAT, and found that the probability of forced outages among power generation plants in the system actually *decreased* when energy efficiency scenarios were pursued, such as standards for new buildings (Busch 1991). This interpretation flatly contradicts EGAT's interpretation that DSM programs are inherently "greater risk" than new power plant construction. Although Busch worked with EGAT during his Ph.D. data collection in 1988, and presumably would have disseminated his 1991 analysis, his findings appear to have been ignored by the planners.

By 1999, EGAT still had not move decisively to implement IRP. The Power Development Plan for that year states that:

An analytical framework and a procedure for integration of DSM into the system planning process *are expected to be established in the near future*. Electric Power Research Institute (EPRI) [U.S.-based, funded by member utilities in North America] *will be retained* to develop a framework within which DSM will be integrated. The framework will specifically address the methods for the following items . . . Integration of process and market evaluation results . . . Sensitivity analysis . . . Financial analysis of DSM . . . (EGAT 1999: 29; emphasis added)

I attended two public seminars in August and September 2004 where senior engineers from a Thai utility made presentations. One engineer presented his organization as doing IRP, in his introduction, but gave no further details. He focussed on the privatization debate currently engulfing the industry. The second engineer, a planning specialist, did not mention IRP at all. When queried, he reasoned that the utility had already taken large energy efficiency programs into account by revising its demand forecast downwards – the rationale we just visited in the PDP 92-01. This is not, strictly speaking, IRP as introduced above (systematic comparison of alternatives, followed by combination on base of cost). When pressed on that point, the presenter agreed. The Ministry of Energy’s strategic plans contain no mention of IRP.

### **Fragmented authority and capacity limitations**

Three separate energy efficiency/energy conservation programs exist, with weak interaction. In 1992 – a decade prior to the establishment of the Ministry – the Department of Energy Development and Promotion (DEDP; now DEDE)<sup>14</sup>, was mandated by the energy conservation and promotion act to be the lead implementation agency. The Act also set up an energy conservation fund, but NEPO acquired control over that fund. Independent analysts have criticized NEPO’s decision to pay electricity industry privatization studies from that fund (Greacen and Greacen 2004).

Meanwhile, DEDE (pragmatically) passed responsibility for actual DSM

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<sup>14</sup>DEDP, a descendent of the National Energy Authority, is now the Department of Alternative Energy Development and Energy Efficiency (DEDE).

program implementation over to EGAT, and started its own energy efficiency programs, currently relying on IIEC and Danish consultants for technical assistance (Dr. Wisai, interview 10/9/04; Vongsoasup et al. 2004). DSM staff at EGAT say much of the detailed data on customers resides with the MEA and PEA, yet these utilities have even weaker incentives than EGAT to invest in energy efficiency (Chamnarn, interview 24/9/04).

At the level of Ministerial policy making and implementation, the new Ministry of Energy has issued highly aspirational renewable energy targets, not fully backed by convincing strategies (C. E. Geacen 2005b). In 2002, the Ministry of Energy announced, that by 2011, eight percent of its total primary energy target would be sourced from “new and renewable” sources (a category that excludes large hydropower). According to DEDE, the lead agency, Thailand would meet this target by promoting renewable sources, on the one hand, and promoting energy efficiency, on the other. Critics argue that today no plan exists capable of implementing this lofty target (C. E. Geacen 2005b).

On the other hand, independent analysts complain that EGAT’s role as monopoly buyer gives it de-facto power over the rate at which supply contracts are issued to all new entrants, including small (<90 MW) and very small (<1 MW) potential suppliers of renewable energy. An optimist might demur, arguing that the current scattering of programs will make a difference – in other words that another period of progressive reform is about to commence. However the supply expansion paradigm still dominates:

In August 2004, at a public meeting over the proposed Nam Theun 2 hydropower plant, Mark Segal, an independent economist, asked to evaluate whether supply from Nam Theun 2 was least-cost, argued in the affirmative, especially when the comparison was with natural gas turbines (Segal 2004). He did not ignore the potential of energy efficiency and DSM, but assigned it to its traditional role of reducing the final demand.<sup>15</sup> In a meeting with Bank directors in early 2004, sustainable energy advocates argued that the Bank’s investment in a large-scale hydro project would shoulder small renewable options out of the Thai market.

A final issue is that of development of in-house capacity to conduct requisite analyses. In the early 1990s, that capacity did not exist: IIEC supplied it in the form of

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<sup>15</sup> I wrote a courteous letter to the Bank, arguing that Segal’s least-cost analysis, despite its sophisticated cost-risk approach, was not, by definition, an integrated least-cost analysis.

the DSM Master Plan. In 2004, much of the capacity to conduct multi-sectoral analysis still resides at IIEC or other non-state actors – not at EGAT, nor at DEDE, nor elsewhere in the Ministry of Energy. Danish energy consultants advise DEDE to the point of maintaining a second office at DEDE.

In sum, we see fragmented responsibility, with no strong actor conducting comprehensive policy analysis or performance evaluation at the scales demanded. In 2004–05 reform advocates have called for a new, independent, and strong regulatory agency to diagnose institutional problems and compel utilities to conduct IRP (C. E. Greacen 2005a; 2005c). While attractive in principle, it is unrealistic to expect any single agency could transform electricity planning and policy without concurrent and radical change to the governance structure of other electricity agencies.<sup>16</sup>

## **Towards explanation**

I now turn to consider some possible explanations for the distinctive – yet distinctively limited – success of the energy conservation reform agenda to change Thai electricity planning practices. The most obvious starting point is the explanation that cost-plus utilities worldwide have very limited incentives to take energy efficiency investment seriously. Many cost-plus utilities find stronger incentives to sell more electricity rather than less. As the IRP Manual puts it:

Institutional and legal barriers impede rates that allow utilities to recover the cost of DSM programs. . . . *Profits also need to be decoupled from increased sales; utilities should not be penalized for lower revenues from successful DSM programs which increase the level of energy services provided to their customers.* These barriers are very strong and impede the elaboration of an IRP that will be put into practice (Swisher et al. 1997: 74–75; emphasis added).

Thailand's DSM program allowed EGAT to recover its expenses, such that the cost of DSM program expenses was revenue-neutral (du Pont 2002). EGAT however cannot earn a *profit* on DSM programs, as it does on building new supply. This is because EGAT's energy conservation expenses are not classified as part of its rate base, the set of costs for which utilities are allowed an authorized rate of return (Swisher et al., 86). In short, EGAT's profits remain tied to its energy sales. By contrast, in the early 1990s California's regulator allowed its privately-owned utilities

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<sup>16</sup> I thank Noel Rajesh for emphasizing this point.

to keep a portion of the net economic benefits of the energy efficiency programs they invested in. This decoupled the link between a utility's energy sales and *profits* (ibid., 88–91).

A general lack of incentive goes a long way towards explaining Thailand's limited adoption of DSM. However, we also need to understand how incentives are perceived and constructed. Table 4 presents the reflections of five practitioners, each with more than ten years experience working in Thailand.

Rather than only a deficiency of incentive, we see that in practice, the situation is more complicated. Planners and senior management believe aggressive implementation of DSM will lower total *revenues* – despite the program's revenue-neutral design (du Pont 2002). Utility accounting procedures appear to hinder more transparent communication. Manager Phumrerk told me that DSM program expenses are accounted for in the same way as public relations expenses are accounted for, as a line item expense. Actual program details do not appear as sub-line-items. The sense we get is of an organizational culture that has evolved to tolerated levels of ambiguity that functionally benefit its underlying *modus operandi*.

Finally, striking a blow against DSM from another direction, respondents indicate that senior management and planners persist in believing that DSM programs are not as reliable as tangible power plants. The qualitative difference in terms of reliability between a new power plant and new DSM programs strikes me as a worthy component of explanation, especially when considered with other data about the

**Table 4 Reflections on how DSM is perceived within a Thai utility**

Issue / Summary	Reflection
<p><b>Sales:</b></p> <p>DSM lowers sales, which is bad for the organization</p>	<p>The budget for DSM programs comes from the central budget . . . the cost items are not clearly specified . . . people looking at the accounts perceive that if they don't conduct DSM programs there will be more money left over . . . besides, total sales will fall . . . at any rate we can't demonstrate how DSM is good for the organization . . . the organization still views that all the energy it produces gets consumed, the more sales the better . . . It's a problem all over the world. (Phumrerak, 24/9/04; emphasis added)</p> <p>The fact that the DSM office hasn't been closed is because the Ministry sees its value, they see that the organization is good at doing programs. But senior management don't particularly support it, they think that selling electricity is better than working on DSM. (Chamnarn, 24/9/04)</p>
<p><b>Profits and accounting:</b></p> <p>DSM lowers profits (in the context of ambiguous accounting)</p>	<p>People in the organization have been socialized according to business principles . . . they emphasize making profits, they don't consider the larger [societal] context . . . even though the cost of programs can be passed on [to the customer] lower sales will lead to lower profits . . . DSM for this organization is really about building a positive public image. (Phumrerak, 24/9/04)</p> <p>(Interviewer) Has anyone actually calculated the impact upon profits?</p> <p>Nobody has analysed the impact upon net profits . . . there are many complications involved in analysing profits and losses . . . does the organization want to maximize its profits, or does it want to pursue the highest benefits for the country? IRP has still not happened because they look at maximizing profits . . . . Actually, DSM should be the first priority . . . especially in the context of increasing energy prices . . . . It certainly is a common benefit, but is not clear that it is a benefit to the utility as an organization. (Phumrerak, 24/9/04)</p> <p>Financial matters haven't been that important to the utility. For two reasons. First, they are a monopoly, second, because the tariffs guarantee that they'll have money to pay back their loans . . . it's clearly written in the structure of the base electricity rate . . . . However when the load didn't grow as they thought it would, they found themselves losing money, for example when they predicted eight percent, but it grew at six . . . . [In any case] they view that if they have financial problems, the government will support them . . . . That was true especially in the past when the government guaranteed their loans so that their loans were public debt, now however government must increase equity in order to reduce public debt . . . . There is still plenty of protection for them. (Dr. Prasit, 27/9/04)</p>

(Table 4 continued)

<b>Issue / Summary</b>	<b>Reflection</b>
<p><b>Reliability:</b></p> <p>DSM is not as reliable as new power plants</p>	<p>The planning division and most senior managers are not particularly confident that DSM programs will reduce demand . . . . [DSM programs] cannot answer concerns about reliability . . . “blackouts are not acceptable” remains the mantra. New power plants are tangible, unlike DSM. (Chamnarn, 24/9/04).</p> <p>[The organization] sees the role of DSM programs as increasing the reserve margin. (Phumrerak, 24/9/04)</p>
<p><b>Senior management support:</b></p> <p>Current management do not give DSM strong priority</p>	<p>The DSM program’s real start was in 1995 [under Sithiporn Rathanopas]. . . he was aggressive . . . Dr. Piyasvasti [head of NEPO] was also aggressive . . . in 1999 or 2000 Sithiporn left the utility to join a private power producer . . . since then there’s been a caretaker director . . . there’s not much creativity or energy . . . the program is going on autopilot . . . the staff are capable but management isn’t strong, there’s no strong commitment. (Dr. Wisai, 10/9/04)</p> <p>[After he was promoted] Sithiporn proved to be a good executive with hands-on background in experience in DSM. (Woranuch, 24/9/04)</p> <p>Decisive management could have addressed the above issues of DSM – its reliability, how to measure it, how to look at its costs. (Dr. Wisai, 20/11/05)</p>

Source: interviews with utility managers and industry analysts.

organization's incentives. In 2004, union members were adamant they will oppose any structural reform initiatives that do not give EGAT the right to build less than half of new capacity. We see how reliability functions to prop up the growth ideology.

It is worth noting that when it introduced the DSM Master Plan in 1991, IIEC was very clear and prescient about the discursive shifts required in Thai planning practices:

For DSM to succeed in Thailand . . . the utilities must believe in energy efficiency as a resource for the Power system. The utilities must think of investments in DSM as being just as important as investments in new power plants. Understandably, the utilities may find it difficult to accept that they should be the driving force for DSM. Some utilities in North America initially resisted the move toward DSM. Some considered DSM as a separate

activity that was unimportant, or perhaps harmful, to the utility's main purpose, or something that should be taken care of by a government agency. . . . Why did some utilities accept the idea of DSM more easily? These utilities made an important realization: they could lower their total costs by investing in the least-cost energy resource. . . .

Marketing is the key to the success of the entire DSM effort. Without a clear and attractive marketing campaign, people will not participate in DSM programs, and there will be no savings. The key to actual DSM savings is **marketing, marketing and more marketing**. (IIEC 1991: 26, 28)

The respondents I interviewed, by contrast, were equally aware that theirs was not a “marketing culture.” [Senior managers] have a “practitioner mentality,” said one utility manager. The mentality to which he refers resembles the one discovered by von Meier (1999), who calls it “operator culture.” Von Meier studied technology adoption in the U.S. electric power industry. She found two cultural groups: “operators” and “engineers:”

Operators of technical systems, be they power plants, airplanes or air traffic control, must keep the system working in real-time . . . Unlike engineering, where the object is to optimize performance, the goal in operations is to maintain the system the state of equilibrium . . . steering clear of calamities. An operating success is to operate without incident. . . . In contrast to the engineering representation, which was described as abstract, analytical, formal, and deterministic the operator representation of the technical systems can be typified as *physical, holistic, empirical, and fuzzy*. (von Meier 1999: 7–8)

To the extent that planners or senior management at EGAT indeed work in an organization with a dominant operator culture or practitioner mentality, their construction of the interests of the organization as a whole would be weighed by the goal of operating without incident. In that case, alternative scenario reliability analysis of the kind conducted by Busch (1991), an outsider based in California, might not seem very compelling.

In summary: while energy conservation opened up new possibilities for power system planners, it entailed new organizational challenges, including building both technical and marketing capacity. The most fundamental impediment appears to be the continued link between electricity sales and profits, in the context of dependence on capital markets. EGAT has proved competent at implementing DSM programs, yet has not changed its fundamental purpose.

## 5 The rise of a sustainable energy advocacy network

A small sustainable energy advocacy network exists today in Thailand. Despite resource and capacity limitations, it has been able to help local communities affected by existing and proposed power projects as well as publish policy narratives critical of Thai power planning governance. Table 5 compares its policy positions on planning with status those of status-quo practice.

The rise of the sustainable energy advocacy network has several origins. One key dynamic is local opposition to non-participatory power projects, supported by alternative development NGOs. Such projects included Nam Choan and Pak Mun in the 1980s and 1990s, as well as other large irrigation and hydropower dams proposed and built during the 1990s–2000s (Foran 2006: chapter 6).

Another related influence should be traced back to the establishment and increased authority of NEPO since the late 1980s, as a rival to EGAT in terms of policy analysis and solutions. By the mid-1990s, as civil society advocates increased their interaction with project-affected people, as NEPO analysts became increasingly critical of EGAT for systemic reasons, and as domestic and foreign NGOs began pressuring EGAT and the World Bank for greater accountability, an advocacy network emerged.

In the mid-1990s, NEPO advocated EGAT's privatization, sparking a backlash by EGAT's union in 1997, and forcing the Chavalit government to defer the issue (Watershed 1997). Efforts by NEPO to expedite private coal-fired power plants, along with EGAT's signing of power purchase agreements *before* holding hearings or environment assessment, contributed to strong local opposition to two coal-fired plants planned for Prachuab Kiri Khan province. Developers' public relations contributed to dividing local communities between a faction that viewed impacts in positive terms (construction jobs, land appreciation), and those who voiced concerns about impacts of pollution on orchards, coastal fisheries, marine mammals, and

**Table 5 Contested elements of power system planning, recent period**

	<b>Priorities / Practices / Alternatives</b>	
<b>Variable / Issue</b>	<b>Thai agencies</b>	<b>Sustainable energy NGOs</b>
Planning governance	<p>Six-step de-facto process with negligible public participation  <i>(TLFS → EGAT Planning Division → EGAT Board → NEPO → National Energy Council → Cabinet)</i></p> <p>[Key steps in italics]</p>	<p>Want significantly more access and power in planning process</p> <p>Constrained by expert knowledge and lack of access to certain technical data</p>
Demand estimation	<p>Thai Load Forecasting Subcommittee (TLFS)</p>	<p>Want more civil society role in TLFS; want updated, disaggregated forecasting methods and lower macroeconomic growth estimates based on maturation of economy</p>
Energy conservation	<p>3 programs:            EGAT – energy savings (demand-side management; DSM) programs for large buildings, also consumer appliance labelling            EPPO – public awareness / rebates for saving            DEDE – large buildings</p>	<p>See more potential for energy savings than do responsible agencies through rigorous use of Integrated Resource Planning (IRP) techniques</p>
Scale of new supply	<p>Favour increments of 700 MW combined cycle gas turbine (CCGT)            Favour large hydro for peaking power / but constrained by public            See limited technical potential in retrofits because of capacity mis-match</p>	<p>Favour small scale renewables</p> <p>Favour 150 MW of combined-cycle natural gas turbine for non-renewable energy</p> <p>Favour retrofit of existing old capacity wherever possible</p>

(Table 5 continued)

Location	Favour distributed generation (large regional nodes) Use existing poles and lines Community support	Favour distributed generation (small nodes)  Authentic community acceptance critical
Fuel source	Favour traditional local & regional fuels (natural gas, lignite, hydro) Reduce reliance on natural gas (NEPO/EPPO)	Favour more aggressive support for renewable energy (biomass, wind)

and tourism. NGO networks in Bangkok supported the latter faction. Intimidation of protest leaders was not uncommon (Surasom 2004).

After the financial crisis, NEPO continued to promote the Prachuab coal-fired plants. Sustainable energy advocates argued excess power generation capacity made these plants unnecessary (Anonymous-1 2002). The civil society advocates were assisted by some NEPO staff who disagreed with their agency's position. Foreign NGOs such as Probe International also joined the struggle by pointing to the conflict of interest between the government's investment in private projects, and its regulation of those projects' rates of return (Ryder 1997).

One of the current active nodes in the sustainable energy advocacy network is the Health System Research Institute (HSRI) in the Ministry of Public Health. HSRI's director Decharut Sukkamnoed is an economist with a wide-ranging interest in social and economic implications of conventional energy development, and was an important contributor to the Pak Mun research study conducted by Ubon Ratchathani University on behalf of the Thaksin government (Foran 2006: chapter 8). HSRI has organized public panel sessions focussed on energy and community health (broadly defined).

The sustainable energy coalition gathered momentum with the formation in 2002 of Palang Thai, a vigorous NGO working on energy policy. This small organization of articulate engineers was founded by Chuenchom Sangnarasri Greacen, a former NEPO analyst, and her husband Christopher, both of whom graduated from the Energy and Resources Group at University of California, Berkeley. Palang Thai

has contributed significant analytical capacity to other NGOs working mainly with local communities on discrete power project problems since the early 1990s, such as Alternative Energy Project for Sustainability (AEPS). Palang Thai regularly supplies technical advice to EPPO as well as other organizations. One of its early and notable contributions was to design policies and write legislation to allow small and very small power producers to sell excess electricity they generated to the grid.

Another active node in the sustainable energy network is the Confederation of Consumer Organizations (CCO). When electricity tariffs increased in 2001 by a noticeable 25 satang per unit, this small NGO organized a series of public seminars criticising the tariff structure. Critics drew attention to the “Ft” charge, a line-item on the electricity bill that supposedly captured the volatile cost of fuel used for generation. Since 1998, civil society advocates had attacked the Ft for concealing mechanisms to maintain minimum returns for EGAT and private producers even in the face of lower-than-expected demand (Sangarasri 1998; Sukkumod n.d.). They campaigned to abolish it. In response to the 2001 campaign, the Thaksin administration set up a multi-stakeholder process in which the CCO, HSRI, and other organizations, such as the Federation of Thai Industries (FTI), participated. In 2004, in the wake of EGAT union protests against the administration’s move to incorporate EGAT and sell 49% of its shares publicly, the CCO played a key role helping the Senate Committee on Public Participation design two participatory hearings to scrutinize and debate the future of EGAT (Saithan, interview 11/9/04).

Impetus for these hearings came from civil society advocates opposed to the government’s plans to push through the privatization of EGAT. The Thaksin administration had previously conducted a series of regional public hearings. Sustainable energy advocates denounced their narrow agenda and persuaded the Senate Committee on Public Participation to organize two broader and more deliberative hearings (interviews with Saithan, 11/9/04; Khamkrit, 13/9/04). At those June 2004 hearings, activists presented an alternative power development plan (Witoon 2004).

### ***5.1 An alternative power development plan***

The “alternative PDP” was presented by Witoon Permpongsacharoen,

representing the National Economic and Social Advisory Council (NESAC). NESAC, a 99-member policy advisory council, is an independent agency mandated under the 1997 constitution, and Witoon heads a well-known environmental organization.<sup>17</sup>

The alternative PDP criticizes Thailand's electricity supply industry structure, its governance problems, as well specific system planning practices, such as demand forecasting, and the exogenous role of DSM (Witoon 2004; Sukkumnoed et al. n.d.). It also makes specific (normative) recommendations to EGAT's 2004 PDP which includes increasing the supply of electricity sourced from clean renewable energy, while cancelling plans that source energy from large hydro plants (Nam Theun 2) and large new plants in general.

The Alternative PDP met with a distinctly cool reaction from EGAT's powerful union, and no public reaction from EGAT's pro-union management (Vidhaya, interview 28/9/04; Prachseri, interview 27/9/05). Prior to releasing their plan, energy advocates had established a short-lived rapport with EGAT's union. The advocates opposed any privatization plan that did not make extensive governance reforms. The union opposed plans to downsize EGAT into separate transmission and generation companies, the latter of which would be forced to compete against private power producers. By late 2004, the Ministry of Energy made it clear there would be no radical unbundling of EGAT, thereby appeasing the EGAT union. In 2005, as the second Thaksin administration attempted to sell 25% of a largely-unchanged EGAT,<sup>18</sup> the sustainable energy network publicized in the print media its call for a strong independent regulator, with power to approve supply expansion plans, and for participation in long-term planning (C. S. Greacen 2005; C. E. Greacen 2005c; Janchitfah 2005).

## 6 Conclusion

This paper examined the actions and influence of civil society advocates in electricity conservation (early 1990s), and alternative system planning (late 1990s–2000s), in the context of dominant planning practices that I traced back to the 1960s. I

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<sup>17</sup> Project for Ecological Recovery (PER), active in the Nam Choan and Pak Mun cases (see Chapters 4 and 6).

<sup>18</sup> Revised downward, in the face of union opposition, from its original proposal to sell 49% of EGAT. The new public offering proposal placated EGAT employees by awarding them significant stock options.

asked questions about patterns in planning politics, about the role of knowledge and knowledge brokers, and about mechanisms by which reform advocates attempted to influence dominant practices.

Regarding patterns, a remarkable continuity in planning practices spans 1960s to 2005. This continuity exists notwithstanding the rise of NEPO in the 1980s, energy conservation in the late 1980s, and a sustainable energy advocacy network in the late 1990s. Planning practices contributed to a pattern in which high investment in supply expansion produces recurrent perceptions of capital shortages, which in turn inspired neoliberal arguments for electricity privatization, which we can trace back to the early 1980s in Thailand.

I credit the strength of institutional incentives for this continuity, but explicitly did not argue that incentive structures alone explain policy *continuity*. Incentives are discursively constructed by real individuals, who mix reflexive strategizing with taken-for-granted adherence to more basic norms (such as reliability or inevitability of economic growth). Nor are incentive structures (institutions) sufficient to explain the timing or content of the policy *changes* we reviewed. Policy scholars who regard institutional explanations as impoverished already know this (John 1998). Thai civil society advocates, who believe they must first change institutions in order to change planning practices, might by contrast find it liberating.

To understand the timing and content of policy changes, I use an approach to explanation which makes use of necessary and contingent social mechanisms (Foran 2006: chapter 3). Consider first mechanisms involving knowledge.

### **Knowledge dynamics**

More refined knowledge did not lead in a straightforward manner to more “rational” planning. Nor did it necessarily open up more public space to raise an issue. More detailed economic and engineering modelling did not have the simple effect of opening up planning practices to outside actors such as IIEC. As the cost-of-supply modelling became much more sophisticated in the late 1980s, it shielded EGAT from independent, potentially critical analysis. Similarly, EGAT staff produced a co-authored textbook on feasibility studies for hydropower design, legitimating their practices (Chulit 1989). As a state agency, EGAT’s knowledge systems were embedded in the institutional arrangements of electricity supply, contributing new

knowledge that buttressed those arrangements. Lebel et al. (2004) refer to this as a “state knows best” structure, where scientific knowledge, generated by state organs, animates command and control practices.

By the early 1990s, reflecting the rise of the environmental conservation movement, the politics of planning and new power plant construction became openly contentious. However those most motivated to question new power plants found EGAT’s planning discourse becoming more sophisticated. As more projects drew censure during this period, EGAT’s most prominent critics – such as Project for Ecological Recovery – would have found the organization unwilling to share information. Critics were forced to rely on intermediaries such as postgraduate students with common values, overseas analysts, and insider critics willing to share insight and data – even the World Bank itself, to the extent it allowed access to analyses conducted for its own due diligence. Given the paucity and transitory nature of these connections, it was easier for conservationists to fault with new proposals based on what they knew best: environmental and social (distributional) grounds.

The knowledge dynamics summarized above, and discussed elsewhere in this paper, contributed to changes in the policy domain of electricity generation. In order to see more precisely how, the next section reviews mechanisms of civil society influence and state reaction.

### **Social mechanisms of influence and control**

Civil society advocates attempted to influence dominant practices by several pathways: (1) Rationalist/technocratic pathway. Civil society actors with technical expertise helped state energy policy counterparts rationally define new agendas. These included demand side management in the late 1980s to early 1990s, grid access agreements in the early 2000s, and more recent technical policy analysis conducted by Palang Thai (C. E. Greacen 2005a). This pathway of influence also constituted an “epistemic community” (P. Haas 1992) within the larger policy domain – a community limited to technically proficient analysts with the social capital to access state-dominated spaces.

(2) Public agenda setting pathway. Some analysts published information and analyses that, when disseminated by other organizations, allowed activists to frame issues in a more accessible manner (e.g., Anonymous-1 n.d.; Palettu 2003; du Pont

2005). Some of these actors contributed analyses and debating points to prepare activists for key exchanges with elites from opposing policy coalitions.

Such debates, however, gained status and attention to the extent they were sponsored by authoritative public institutions such as NESAC, and the Senate. Since both organizations are large, advocates first needed to create conducive micro-political settings (e.g., by lobbying the chairman of NESAC, and lobbying the Senate Committee on Public Participation to review earlier Ministry of Energy hearings).

Civil society advocates met with counter-mechanisms of control or domination. One general mechanism that limited the influence of activists is what I refer to as “institutional reframing.” Organizations adopted new policy initiatives if they did not significantly threaten key interests and taken-for-granted structures. For example, EGAT’s new DSM program was innocuously reframed during the 1990s as good for EGAT’s organizational image (as opposed to being good for society, a component of least-cost planning, or helping EGAT reduce capital investment). In the context of record petroleum prices in 2004, recent national renewable energy targets improve the Ministry of Energy’s image, despite significant design and implementation problems (C. E. Greacen 2005b; Prachseri, interview 27/9/05).

Conversely, after sustainable energy advocates sharpened their criticism of status quo governance – offering a sweeping set of reforms at the Senate Committee on Public Participation hearings in June 2004 – they were rebuffed or “counter-framed<sup>19</sup>” in negative terms by EGAT staff (e.g., at a public meeting organized by the World Bank on Nam Theun 2, 31/8/04).

In summary, technical expertise possessed by some members of the advocacy network allowed both incremental reforms favourable to sustainable energy, as well as, by the late 1990s, the launching of a far more contentious agenda involving broad-scale changes to EGAT’s governance. The diversity of the issues involved (from governance to modelling to grid access standards) suited an advocacy network (Keck and Sikkink 1998). That structure, with its diverse membership and opportunities for key individuals to exercise multiple forms of agency, to a certain degree dissipated intra-network conflict.

The progressive reforms achieved by the advocacy network occurred however in a larger context of unsustainable energy use. This leads us to consider the larger

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<sup>19</sup> By counter-framing I refer to rhetorical action deployed to repress or subvert activist framings (Foran 2006: chapter 9).

discursive divisions that exist around electricity supply. Discourse coalitions use simplified and institutionalized “storylines” (Hajer 1995).

Maarten Hajer uses the term “discourse coalition” to refer to “the ensemble of a set of storylines, the actors that utter those story lines, and the practices that conform to these storylines, all organized around a discourse”<sup>20</sup> (1993: 47). Once actors commit to a story-line, that story-line channels their resultant strategic actions (1995: 264).

Applying this framework, Hajer found that the politics of acid precipitation played out very differently between the Netherlands and the U.K. Both countries achieved problem closure by adopting pragmatic and symbolic end-of-the-pipe solutions. The prevailing construction of air pollution as an urban and human health problem – as opposed to a rural or environmental problem – shaped the politics of the U.K. debate (1993: 57). Hajer identified a “pragmatist” discourse coalition. It included the British electricity generating board, and its central story-line on acid rain was one of scientific and economic prudence. Against this he found an “ecological modernization” coalition – including Friends of the Earth, and the House of Commons Select Committee for the Environment. Its central story-line was that of “sustainable development.” Key tenets included taking a precautionary approach to reducing emissions.

The powerful pragmatist coalition insisted that one scientific actor, the Royal Society of London, preside over a problem they defined as requiring, in light of the cost of pollution control investments, evidence based on adequate data and reductionist demonstrations of causality (Hajer 1993: 48–52). The British electricity board funded a cross-national study under the auspices of the Royal Society and its Swedish counterpart. Evidence from the study linked sulfur emissions to acidification in Norway. Other analyses showed that by making limited retrofits and phasing-in new power plants, the U.K. could meet its prior commitments to reducing SO<sub>2</sub> emission. The Thatcher government acted on the basis of these framings.

Hajer’s findings of close connections between elite actors and science-based policy raise striking parallels with this study. In both cases, storylines provide a template for actors to assimilate new experience, including data and technical knowledge discourses. One consequence is that new experience is usually dwarfed by

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<sup>20</sup> Hajer’s concept of *discourse coalition* is thus much broader and more diffuse than Sabatier’s *advocacy coalition*, in which actors share a non-trivial degree of coordinated action in the pursuit of core beliefs.

the basic storylines coalitions operate with.

EGAT's storyline is that of the cost-plus utility, guaranteed an adequate return on investment. In this storyline, system expansion is both beneficial and an inevitable result of economic growth. In this context, new data produced by more transparent accounting might make DSM more visible to EGAT senior management. However as long as energy conservation means profit losses for the utility, such data make little difference. Calls for increased transparency instead further a market liberal reform agenda.

### **Macro-scale consequences**

Market liberals now want EGAT to increase the proportion of capital it sources from equity markets. There is not a little historical irony in this, and it escapes all but the most critical observers. The irony is that the fundamental driver of financial un-sustainability comes from continued investment in expansion plans that arguably are *not* least-cost. In so doing, the utilities siphon capital away from the very markets they are embedded in, inspiring calls for privatization, and setting them in contention with project-affected people.

With their obsession on solving short-term capital problems, market liberals fail to see that no amount of financial restructuring can rescue an intellectually defective organizational strategy. The supreme irony, I argue, lies in this failure of construction. Organizations like EGAT and the Ministry of Energy treat energy conservation and renewable energy as an after-thought, an accessory to their main business of planning and financing conventional engines of capacity. EGAT's strategy obstructs transition to futures that are equitable, desirable, and technically and ecologically sustainable. Instead, such transitions require vigorous and sustained debate on the sector's current construction of profits and reliability.

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