Towards more sustainable energy futures for the Mekong Region: Policy options for development donors

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Abstract

Today's Mekong Region is the site of a number of contrasting visions for energy systems development. Those include common regional markets for energy, linked by long-distance pipelines and power lines. Contrasting visions from civil society organizations include independent regulation of the energy sector in the broader public interest, integrated energy services planning, and more concerted support for renewable energy that is decentralized and devolved. Civil society organizations also prescribe performance-based regulation of power utilities.

Barring major external shocks or internal challenges, policy continuity, not major institutional and planning practice reform, will be the most likely energy storyline during the next decade. Such a scenario reflects the magnitude of imported and indigenous fossil fuel dependence and the closed nature of energy planning. It also reflects the longstanding prevalence of a cost-plus utility model for energy organizations, whereby profitability hinges directly on gross revenues, with limited incentive to invest in energy savings. "Business as Usual" also reflects the lack of clear commitments to incorporate "external" social and environmental costs.

The interlocking institutions and interests driving the region's dominant energy trajectory mean that well-intentioned interventions – such as various "clean energy" initiatives – will achieve only limited and incremental sustainability outcomes.

Development donors face a basic choice: they can continue to support and take guidance from existing multilateral energy initiatives, or they can define a more rigorous and effective role for themselves as agents of sustainability. The first option may lead to incremental changes in uptake of renewable energy and energy efficiency, but is unlikely to result in significant change in governance of the sector.

A more transformative contribution to sustainable energy systems for the Mekong is possible. Key components of that assistance would include **pro-sustainability regulatory reform** and vigorous support for **participatory integrated planning**.

1. Introduction

In early 2004, a number of World Bank directors met with Thai sustainable energy advocates to discuss the Bank's role in the Nam Theun 2 hydropower project. The advocates argued that small-scale power generation and energy savings options within Thailand existed. NT2 was ecologically destructive and not really needed. The advocates further argued that NT2 would delay the adoption of small and profitable RE for years to come. Later that year, after receiving expert estimates of renewable energy and energy efficiency alternatives, Bank staff responded that the Thai market for electricity was growing so strongly, there was plenty of room for NT2, for energy savings, and for small renewable options.

Contrasting visions and quantitative scenarios exist for the Mekong Region's energy future. The exchange above also reveals the importance of choice and possibility in the Mekong Region's energy futures.

As of September 2007, Australia has not articulated a distinct, coherent energy sector assistance strategy for the Mekong region. It has signaled a willingness to co-finance the energy programs of multi-lateral development banks such as ADB (2007a). It has also registered support for the Asia-Pacific Partnership on Clean Development and Climate (2007). The ADB energy strategy and the AP6 partnership include a number of important priorities. However no multi-lateral energy initiative takes on one of the most fundamental obstacles to sustaining energy services: the rate-of-return or "throughput" incentive. This channels electricity organizations to selling energy, rather than energy *services*, in order to return profits (Moskovitz 1989; US-DOE and US-EPA 2006). Eliminating it requires an order of magnitude strengthening of regulatory frameworks, as opposed to more modest regulatory assistance contemplated by ADB (2007a: 28).

This paper briefly reviews forces influencing growth and evolution of the region's energy systems, particularly electricity generation. Many of the examples are taken from Thailand and from the power generation sector. Thailand is a net energy importer, with significant experience in energy efficiency, and recent ambitious targets for renewable energy.

AusAID – or any other Mekong development assistance donor – faces a basic choice – it can continue to support and take guidance from existing clean energy and renewable energy initiatives, or it can define a more distinctive role as an agent of change.

The first option is by far easier. Development donors can follow the lead of multi-lateral programs led by ADB, AP6, APEC, or ASEAN. This choice will produce incremental and meaningful changes in the uptake of RE and energy efficiency, but will not make any transformative change in energy governance. The region's energy organizations would continue to run without the benefit of public-interest regulatory bodies and civic participation, without integrated energy services planning.

We argue that the most distinctive role a donor can play in the region is to focus on getting two very basic institutions right: performance-based regulation of energy

suppliers, and integrated planning.

2. Mekong Region energy systems

A number of basic social forces currently drive the Region's energy systems. They can be summarized as follows:

(1) High dependence on indigenous and imported fossil fuels

Coal, oil, and gas play a dominant role in the primary energy mix of Asian countries (USAID 2007). This dominance will grow in the future as commercial energy replaces renewable energy in the household sector.

The Mekong Region, along with India and China, is on a fossil fuel fast-track. The oil import dependency of Southeast Asian nations will increase from 9 percent to almost 70 percent, with most imports to come from the Middle East (USAID 2007: 26).

In Thailand more than 91% of electricity generation comes from fossil energy (EGAT 2007). The dominant fuel for electricity generation is natural gas (two thirds of total energy). Mainstream planners in Thailand consider that one of the most important choices for fuel-diversification (and thus energy security) is to reduce the proportion of natural gas for electricity generation. They would replace it with coal and hydropower, to the extent politically feasible. (Most of the hydropower would be imported from neighbors; coal would be imported to supply new domestic power plants.) In addition, nuclear has emerged on the Surayud government's policy agenda, with a declaration to commission a new nuclear power plant of 2000 MW capacity by 2020.

Southeast Asia leads the world with its >6% growth rate of electricity demand (USAID 2007: 23). Work in progress commissioned by ADB estimates that the region's energy demand grew 6.8% per annum 2001–2005, and projects it as continuing to grow *between six and seven percent* per annum until 2025. The need for new fossil energy plants and refineries is likewise enormous (ADB 2007b).

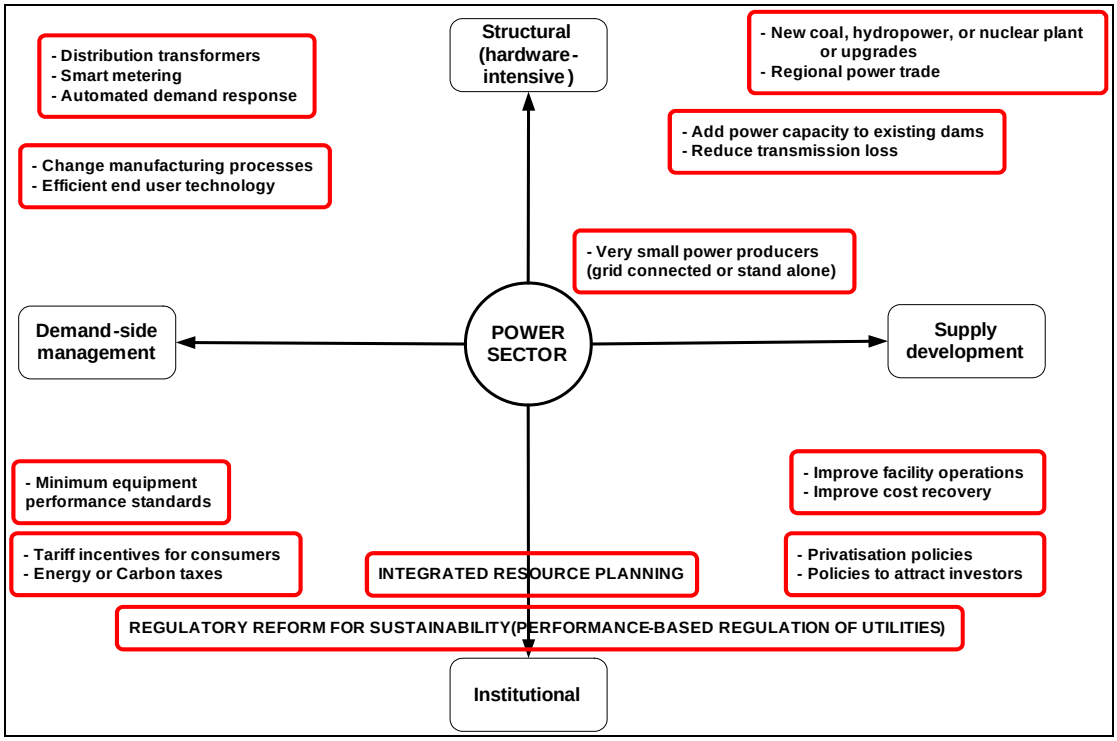
(2 Institutional preference for large scale, supply-side options

Figure 1 maps a variety of options available for planners to meet energy services, on both the supply side and demand side.

Most of the options identified by planners come from the category of *large-scale, supply-side, structural* measures. Planners perceive that large-scale supply is the most cost-effective way to meet rapidly growing demand. For instance, the computer optimization models used by Electricity Generating Authority of Thailand (EGAT 2007) include only the following options to meet rising demand:

700 MW Coal-Fired Thermal Power Plant
700 MW Gas-Fired Combined Cycle Power Plant
230 MW Gas Turbine Power Plant
1,000 MW Nuclear Power Plant

Figure 1 Options for power system development



Source: Adapted from Practical Action Consulting (2006)

Other options, such as <1–100 MW scale biomass, combined heat and power (CHP) generation, or large hydropower, do find their way into Thailand's final Power Development Plan, but only after the main optimization analysis is done. In other words, they are not evaluated side by side with the fossil and nuclear options.

Another powerful driver of supply-side solutions stems from the fact that the region's energy organizations operate according to a traditional rate-of-return or "cost-plus" utility model. Under this structure, profitability hinges directly on gross revenues. There is limited incentive to invest in energy savings, and maximum incentive to invest in generation plants owned by the utility.

In Thailand, EGAT serves as a single buyer of bulk electricity. Two other utilities distribute that electricity to end-users. Unless able to generate their own electricity on site, end-users cannot "choose" their electricity technology.

(3) Renewable energy and energy efficiency are on regional policy agendas, but still assigned a lower priority than large scale, fossil technologies.

Renewable energy. In recent years, the status of renewable energy has improved in the GMS. In Thailand there is a discernable degree of support for renewable energy (RE) within EPPO, the Energy Policy and Planning Office. EPPO has been influenced by policy analysis recommending price supports ("feed-in tariffs") to internalize environmental and social costs of fossil energy. Other drivers include generous estimates of biomass feedstock potentials in Thailand.

Notwithstanding the presence of feed-in tariffs, independent analysts have voiced a number of concerns about bureaucratic or non-transparent decision making by the utilities, leading to difficulty obtaining renewable energy licenses (Greacen 2005a; Greacen and Footner 2006; Jepsen, Møller et al. 2006).

A study by USAID reviewed six Asian countries, and noted they have developed policies conducive to renewable energy.[1] China is expected to lead in production of RE in Asia by 2020. But in 2030 the overall scale of renewable energy supply among the six countries is still dwarfed by consumption of coal, oil, and gas (USAID 2007: 23).

> The development landscape for renewable energy technologies is a rapidly evolving one and is attracting intense interest from a range of players including large commercial banks, investment banks, large energy equipment manufacturers, and niche players . . . [however] without a sustained effort to promote wider adoption, the overall contribution of renewables to Asia's energy mix is unlikely to rise above 5 percent by 2015.
>
> USAID (2007: 40–41)

Energy efficiency. The situation with energy efficiency is somewhat different. Some countries (Thailand) have significant experience implementing energy savings programs, others (Vietnam, China, Lao) are just beginning. Technical expertise alone, however, is insufficient to guarantee strong ongoing energy savings. High priority on policy agendas appears to be as important. In Thailand, energy conservation analysis and proposals were crafted with enthusiasm beginning in the late 1980s, and competently implemented during the 1990s. Yet by 2007, it is clear that energy conservation has not been systematically pursued to the limits of its potential (Foran 2006; Foran, du Pont et al. 2006). We noted that EGAT's power development planning does not evaluate demand and supply side options on an equal footing (see EGAT 2007). As with renewable energy, targets and programs energy efficiency are selected in a more informal manner, in a way which fluctuates between governments.

(4) Low quality energy governance prevails

Meaningful participation. Elite-driven decision-making is common in the region, with limited or negligible public input into a range of important and sensitive issues, ranging from power station siting to major privatization initiatives (Foran 2006a; Nakhooda, Dixit et al. 2007).[2]

Thai governments has had significant and recurrent problems with gaining public acceptance of new power stations and gas pipelines (Janchitfah 2004; Foran 2006a). Coal is particularly controversial, but even small-scale biomass plants have proven difficult.

These difficulties are driven by the lack of impartial local consultation processes,

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[1]China, India, Malaysia, Thailand, Philippines, Vietnam. See USAID (2007).

[2] In the US, participation in the affairs of energy organizations occurred as a response to crisis in public utility financing, in the wake of the first and second oil-crises.

occasional corruption of local government, and the perception by civil society organizations that environmental impact assessment processes have little bearing on decision making.

Governance reform framed as privatization and integration. In the past, a number of actors including Thai state agencies, World Bank and ADB, assigned high priority to privatization of energy organizations such as EGAT and Petroleum Authority of Thailand, in the name of greater efficiency and lower costs to consumers. Governance reforms thus focused on market-oriented solutions (Greacen and Greacen 2004).

Resistance from civil society has led to recognition by ADB, in its recent energy strategy documents that privatization (1) is controversial and (2) is insufficient to solve all needs (ADB 2007a). Multi-lateral donor attention has shifted instead to integration of energy infrastructure and the eventual creation of a common market.

Missing from most of discussion in the Mekong is acknowledgement that independent public interest regulation (regulatory functions) is actually required (Greacen 2005b; Greacen and Palettu 2007). By contrast, regulatory bodies in OECD countries have served as critically important venues for the public to voice concerns not just about fair tariffs, but more fundamental concerns about the priorities of energy planning (Throgmorton 1996; Foran 2006b).

(5) Perverse incentives of energy organizations are major obstacles to sustainability

Energy utilities in the region operate as virtual monopolies. While obligated to serve all customers, they also have the privilege of earning a profit on their investments. Under this traditional model, all utility costs are periodically submitted for review to an authority (the regulator), and if approved, the organization will be permitted to recover its costs, plus a profit margin, by passing them on to captive customers. Regulation involves balancing the key interests of the consumer (e.g., reliable energy services), the supplier (full recovery of its costs, a stable policy environment), and that of society (e.g., controlling environmental and social impacts of energy production).

Utilities face a number of perverse, but well-known incentives:

> * Each KWH a utility sells, no matter how much it costs to produce or how little it sells for, adds to earnings.
>
> * Each KWH saved or replaced with an energy efficiency measure, no matter how little the efficiency measure costs, reduces utility profits.
>
> * The only direct financial aspect of regulation that encourages utilities to pursue cost effective conservation opportunities is the risk that if they fail to satisfy regulators costs may be disallowed.
>
> * No matter how cost effective, purchases of power from cogeneration, renewable resources, or other non-utility sources add nothing to utility profits.
>
> (Moskovitz 1989)

Unless such "throughput" incentives are directly addressed, utilities clearly have little incentive (beyond public reputation) to cooperate on energy efficiency and renewable energy. They have little incentive to implement integrated demand and supply least-cost planning. Many alternative incentive schemes exist (Joskow 1986; Mann 1996). In general, removing the throughput incentive can be done incrementally:

Thailand's EGAT is already allowed cost-recovery. While regulators in OECD have worked on fixing perverse incentives (some since the mid-1980s), there has been almost no public discussion of this issue in the Mekong Region.

Actions	**Examples**
(1) Cost recovery. Allow utilities to recover the costs of their program spending on energy efficiency	EGAT
(2) Revenue recovery. Allow utilities to adjust their gross revenues to make up for lost energy sales	Many utilities in North America (e.g., California ERAM method; PG&E shared savings; Ontario Energy Board)
(3) Performance motivation. Allow other profit-making incentives	California – utilities allowed to retain a portion of the net benefits of energy

Sources: Moskovitz 1989; Mann 1996; Swisher, Jannuzzi et al. 1997

A Business as Usual storyline for the Mekong

An outline of the most likely energy development pathway for the Region emerges from the above trends and social dynamics. This outline or storyline suggests that barring major external shocks or internal political challenges, policy continuity, not major institutional and planning practice reform, will be the most likely energy storyline during the next decade. This scenario – "Business as Usual" – reflects the magnitude of imported and indigenous fossil fuel dependence and the closed nature of energy planning. It also reflects the longstanding prevalence of a model for energy organizations, whereby profitability hinges directly on gross revenues, with limited incentive to invest in energy savings. Business as Usual also reflects the current lack of explicit regional or national guidelines to calculate and incorporate "external" social and environmental costs.

3. A distinctive contribution towards energy sustainability

A number of "clean energy" programs operate in, or have been recently proposed for, the region (ADB 2007a; USAID 2007). Successful delivery is likely to make notable contributions to energy sustainability. Clean energy programs typically mix fossil and non-fossil, large scale and small-scale, demand and supply-side options.[3]
Many options are indeed necessary (JGSEE 2006). However, as projections from these programs and other sources indicate, the magnitude and scale of these program-

[3]An exception to this is the Promoting of Renewable Energy Technologies (PRET) project in Thailand (Jepsen, Møller et al. 2006)

level interventions is inadequate to put the region on a distinctly more sustainable pathway (EGAT 2007; USAID 2007).

Are alternative energy futures possible for the Mekong Region and if so how can they be identified, debated, and pursued? Is there a distinctive set of actions that a donor could fund?

Progressive policies and actions for a Mekong Region donor

Performance-based regulation for energy organizations
As noted above, the rate-of-return method used to regulate utility earnings provides strong incentives to maximize energy sales in order to maximize profits.

A strong need exists for alternative incentive systems, which are carefully designed to remove perverse and unintended incentives (Moskovitz 1989; US-DOE and US-EPA 2006; Greacen and Palettu 2007). This process will necessarily involve experts but requires meaningful public participation. Many stakeholders will need capacity building in basics of utility accounting and energy economics.

Integrated resource planning
IRP is an approach to planning that involves designing an integrated supply and demand-side plan that optimizes economic, social and environmental impacts (Swisher, Jannuzzi et al. 1997). Depending on the scale chosen, the plan can be conducted at the national level, or at the level of a particular electricity business (e.g., a utility that distributes electricity to retail users). Energy agencies in the Region with experience in demand-side management programs understand the theory and potential of IRP to transform conventional planning (Foran 2006).

Multi-stakeholder dialogue
One democratic way to identify, debate, and pursue alternative energy futures is via multi-stakeholder dialogue. Multi-stakeholder processes can have high transaction costs and necessarily involve some degree of power devolution. (By participating in dialogue state agencies implicitly withdraw the claim that they know best what people need for development.) Cost and power sharing are real impediments.

Notwithstanding these obstacles, a number energy-related and water-related multi-stakeholder dialogues have taken place during 2006–07 (IUCN, TEI et al. 2007; ADB 2007b).

The significant challenge of providing energy services for the region would seem to be an opportunity for more dialogue. As Figure 1 indicates, there is no shortage of topics. IRP and dialogue can complement each other.

4. Conclusion

To support the decision making of donors interested in energy-related development assistance to the Mekong, we identified two quite different courses of actions. The first consists of supporting **existing multi-lateral policy initiatives**. The second course concentrates on **institutional and planning reforms** for sustainability.
The second option is consistent with Australia's goals. As drafted these include:

> "integrating policies to *improve power sector efficiency, poverty and gender into planning and implementation*. . . . . Australia will also help build capacity for *targeted institutions* within partner governments"
>
> (Commonwealth of Australia 2007)

While efficiency has often been interpreted to mean removal of subsidies and other forms of de-regulation, this discussion paper suggests that a more vigorous interpretation is possible. Re-regulating Mekong energy organizations to more responsively deliver energy efficiency and incorporate renewable energy into their portfolios is what we suggest. Both courses of action are viable and worthwhile, but only the latter directly tackles some of the root drivers of inefficient and unsustainable energy system expansion.

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