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Analysis and Recommendations for the ADB's Greater Mekong Subregion Energy Sector Strategy Study

EXECUTIVE SUMMARY

This paper provides analysis and recommendations regarding the Asian Development Bank's (ADB) Technical Assistance (TA) entitled 'Developing the Greater Mekong Subregion (GMS) Energy Sector Strategy'. The ADB approved the TA in January 2006. This paper evaluates whether the resulting GMS Energy Sector Strategy is likely to be sustainable, equitable, and economic, as well as supportive of good energy practices such as promoting energy efficiency, demand side management, and environmental and social safeguard measures. This paper is prepared in response to the ADB's invitation for comments on the TA design extended at the First Planning Workshop held in Bangkok on 31st July 2006.

1. GENERAL RECOMMENDATIONS

The ADB has attempted to incorporate a participatory process into the TA design, and this does represent a step forward when contrasted with traditional energy planning practices in the region. However, the process recommended by the ADB has several major shortcomings, including:

- the TA steering committee is formed only of Government representatives, and not multiple-stakeholder groups
- representatives from all legitimate stakeholder groups have not been invited into the process
- the influence of the ADB's management during the TA's development and implementation cannot result in an objective outcome endorsed by all stakeholder groups

IRN's main conclusion is that the TA's participatory mechanisms are inadequate to ensure a socially equitable and environmentally sustainable Regional Energy Sector Strategy. Suitable multi-stakeholder participatory models do exist, such as the framework developed by the World Commission on Dams (WCD). Combined with other recommendations made in the WCD, including a comprehensive evaluation of all potential supply side and demand side options, the resulting multi-stakeholder process is known as a Comprehensive Energy Options Assessment (CEOA). In January 2006, 30

NGOs, mostly from the Mekong Region, called upon the ADB to support a CEOA process for the GMS.

IRN recognizes, however, that it is now too late to cancel the present TA. Furthermore, the consultants may conduct some valuable analysis that could feed into a CEOA process if changes are made to the design. Therefore, IRN makes the following general recommendations:

- The ADB should commit to support a Comprehensive Energy Options Assessment for the Greater Mekong Subregion in the immediate future
- The present TA should not attempt to prepare a definitive Regional Energy Sector Strategy. Instead the TA outputs should be considered as an element of the ADB's input into a CEOA for the GMS.
- The TA should adopt the specific recommendations made within this paper.
- The ADB should provide clarification on the proposed consultation process under the current TA, including explanation of how participant's comments will be considered within the final reports of the TA.

2. SPECIFIC RECOMMENDATIONS

Internalization of external costs

The TA design recognizes that non-monetary external costs, such as transboundary, environmental, and social costs, should be integrated into the overall calculation of costs and benefits associated with each potential regional energy scenario. Whilst this is laudable, IRN's analysis of the methodologies proposed by the TA identifies them to be neither systematic nor rigorous. The TA misses an opportunity to take advantage of several recently developed, credible analytical tools suited precisely to the TA's objectives. In addition, there would appear to be an inequality between effort expended on collecting technical energy data and that expended on data regarding social and environmental impacts.

IRN concludes that the TA outputs would significantly benefit from increasing the depth and quality of the external costs analysis. Therefore, IRN makes the following recommendations:

- Allocate greater time and resources to the collection of credible social and environmental data
- Develop a rigorous methodology for internalizing non-monetary external costs using the concurrent application of appropriate tools including: Cost Benefit Analysis (Economic/ Financial Assessment); Environmental, Social, Poverty and Technical Assessments; Sustainable Development Indicators; and Multi-Criteria Analysis

Evaluation of demand side potential

The TA plans to evaluate the potential for energy efficiency (EE) and demand side management (DSM) in the GMS region and incorporate this into the Regional Energy

Sector Strategy. In spite of initial discussions at the First Planning and Consultation Meeting, however, there remains a lack of clarity on the process by which the consultants will undertake this task. Of concern, it would appear that EE and DSM will not be treated as a separate factor in their analysis. Instead EE and DSM potential will be bundled into the total power demand forecasts for each country. As a result, when it comes to calculating the least cost energy solution for the GMS only supply-side options will be optimized.

This approach is not in-line with best international practice, known as Integrated Resource Planning (IRP), which considers a full range of feasible *supply side* and *demand side* options that are then measured up against agreed planning objectives, as well as aiming for lowest economic cost.

In evaluating demand side potential for GMS, IRN recommends:

- The potential role of EE and DSM should be extensively researched for each GMS country
- In evaluating supply side and demand side energy options the principles of Integrated Resource Planning should be applied

Data quality and disclosure

All data contains some degree of error, and predictions of future trends are particularly prone to uncertainties. Ascertaining data of a particularly high quality is vital for computer modeling applications. More specifically, with regards to the present TA the accuracy of data used will determine the degree of uncertainty in the computer model results, and this in turn will reflect the amount of trust that can be placed by decision-makers in any particular policy scenario derived from the computer program.

There is, however, considerable uncertainty at present regarding how much data exists, how much data will be made available to the TA, and the quality of this data. Furthermore, the TA's data quality control mechanisms are yet to be proven. Therefore, it is of great importance that all stakeholders are able to scrutinize the data utilized in this TA to ensure that it is realistic and provided by credible sources.

IRN recommends:

- Significant effort should be expended to determine accurate energy demand forecasts for each GMS country, in particular for Thailand and Vietnam which are the region's largest energy consumers
- Data quality control mechanisms should be proven to effectively exclude weak data
- All data utilized by the study should be publicly released to ensure transparency and accountability
- The assumptions, conditions, and error for each energy scenario's computer simulation should be publicly disclosed in a readily understandable format

Assumptions towards regional integration

Throughout the TA there is an assumption towards promoting regional integration in the energy sector. Yet it remains unproven that regional integration of the energy sector is either the cheapest or most effective way of providing energy services to the people of the Mekong region. On the contrary, several recent studies have demonstrated that only marginal economic benefits are associated with regional integration of the power sector and that even these marginal benefits are accompanied by considerable risk and uncertainty.

IRN also questions the promotion of regional integration of the energy sector in the absence of strong environmental and social safeguards that would be required to mitigate transboundary, environmental, and social risks.

IRN recommends:

- Regional integration should not be promoted until it has proven to be the best solution for the region through a CEOA process.
- The TA should explore effective regulatory and policy tools that would ensure protection of the environment and livelihoods before any further high-risk energy sector development projects are considered.

Private sector involvement

IRN questions the ADB's assumption that increasing the role of the private sector will lead to improved efficiencies in the energy sector that will benefit consumers. Whilst the private sector may promote efficiency on the supply side, under the present conditions found in GMS it is unlikely that these benefits will be passed on to consumers in the form of lower energy bills. Furthermore, increasing the role of the private sector is unlikely to result in the promotion of demand side efficiency and its associated benefits, because private sector companies generate profits only from selling energy. Only the presence of strong, independent energy sector regulators in the region can ensure both demand side and supply side efficiency, and ensure that risks and benefits arising from energy sector developments are equitably distributed amongst different stakeholder groups.

IRN recommends:

- ADB should not promote further access by the private sector to the energy sector in the absence of independent, empowered regulatory bodies.

Decentralized energy production

In particular within Laos and Cambodia there is the potential for decentralized energy to play an important role in providing economical modern energy services to rural communities. Clarification is therefore required from the TA's consultants regarding whether their computer model is able to objectively evaluate the role that decentralized energy production can play in meeting the energy needs of the rural poor.

Background and context

Brief overview of the TA

'Developing the Greater Mekong Subregion (GMS) Energy Sector Strategy' (TAR REG 39002) was approved by the Asian Development Bank (ADB) in January 2006 and will cost US$1,000,000[1]. Its main output is the development of a 'Regional Energy Sector Strategy for the GMS Subregion 2006-2020' that is intended to be endorsed by high-level government authorities at the GMS Energy Sector Forum to be held in December 2006. The Austrian consultants 'Integriertes Resourcen Management' (IRM) have been selected to carry out the Technical Assistance (TA). A final draft report is planned to be submitted by the consultants in February 2007.

Civil Society Call for a Comprehensive Energy Options Assessment

In January 2006, thirty NGOs, mostly from the Mekong region, called on the ADB to work with regional governments, donors, and civil society to undertake a participatory assessment of the region's energy needs and the best options for meeting these needs. The letter identified the main shortcomings of regional energy planning to date and urged the ADB to adapt the proposed TA for Developing the GMS Energy Sector Strategy into a Comprehensive Energy Options Assessment for the GMS region in-line with the World Commission on Dams' recommendations[2].

In response, in March 2006, ADB management assured co-signatories of the letter that a fully participatory approach would be implemented by the TA, and therefore no design changes were necessary[3]. ADB management stated that '[the letter's] suggestions regarding developing realistic demand projections, identifying energy efficiency potential and feasible renewable energy options, integrating environmental and social challenges into the least-cost plan, and adopting economic values rather than financial ones were very much in our mind when we prepared the TA design, and will certainly guide our thinking during the study period'.

Since this time, the ADB held the First Planning Workshop in Bangkok on 31st July 2006, which was entitled 'Balancing Energy and Environment for Sustainable Development in the Greater Mekong Subregion'. At the workshop, participants were presented with the project inception report and comments were solicited[4]. Written comments were also encouraged to be submitted in response to the TA, and this paper has been prepared in response to the ADB's invitation.

[1] ADB will provide US$ 900,000 as a grant. GMS countries will provide US$100,000 in kind.
[2] 'Call for a Comprehensive Energy Options Assessment for the Greater Mekong Subregion', letter addressed to Mr. Rajat Nag, Director General, Mekong Department, ADB. 10th January 2006. (http://www.irn.org/programs/mekong/powergrid.php?id=060113reg.html)
[3] ADB response by Mr. John Cooney, Director, Infrastructure Division, Mekong Department. Letter addressed to Ms. Aviva Imhof, Campaigns Director, IRN. 10th March, 2006. (http://www.irn.org/programs/mekong/pdf/powergrid/060320adb.pdf)
[4] Unfortunately, participants were not provided with copies of the Project Inception Report in advance of this meeting, thus limiting their ability to comment extensively directly on the project design

Detailed comments on the TA design and Project Inception Report

Meaningful participation is not integrated into the TA

Whilst the TA design is certainly *consultative* in design, it is clearly not *participatory* when compared against the recommendations of the World Commission on Dams (WCD)[5]. The WCD is especially relevant to the current TA because the ADB and its development partners already heavily promote hydropower development in the Greater Mekong Subregion[6]. As recently as August 2006, Tim Cullen, former Chief Spokesperson of the World Bank, writing for the ADB's 'Water for All' e-newsletter stated 'the Commission's work still stands as a model of comprehensive international decision-making and consultation'[7]. Furthermore, reflection on the meaning and implications of the WCD recommendations is ongoing in the region. Recently, Government officials of the GMS countries collaborated on a project supported by IUCN leading to a publication entitled 'Mekong Region Water Resources Decision-Making: National Policy and Legal Frameworks *vis-á-vis* World Commission on Dams Strategic Priorities'[8]. The publication arose from a desire by National Working Groups partnering with IUCN on dissemination of the WCD to identify aspects of national legislation and regional agreements that complement the WCD Strategic Priorities as well as gaps in legal regimes at both national and regional levels. Many elements of policy and legal instruments were identified to be consistent with the WCD Strategic Priorities; although there was also recognition that implementation of these must be strengthened in many cases.

The WCD recommendations provide a process-orientated framework for regional energy planning. Regarding participation in the process, the WCD states that a 'Rights and Risks' approach is necessary for identifying all legitimate stakeholder groups that should have a formal role in negotiating development choices and agreements. In a region as vast as the GMS, meaningful participation would best be implemented in a multi-stakeholder, multi-level process[9]. Stakeholders likely to be affected by energy developments, such as communities dependent on the Mekong River's resources, should be included in the development of any regional energy strategy.

An important starting point in developing this participatory process would be the establishment of a balanced, multi-stakeholder steering committee acceptable to all

[5] World Commission on Dams, (2000). 'Dams and Development: A New Framework for Decision Making' *Earthscans Publications Ltd. London, UK.*

[6] Notable pro-hydropower activities include support for the Nam Theun 2 Hydropower Project and other dams in Laos, the Regional Power Interconnection and Power Trade Arrangements initiative of the GMS , and the Mekong Water Resources Assistance Strategy (MWRAS) in cooperation with the World Bank and the Mekong River Commission

[7] http://www.adb.org/Water/Articles/WCD.asp

[8] Oliver, R.A.R., Moore, P., and Lazarus, K. eds. (2006) 'Mekong Region Water Resources Decision-making: National Policy and Legal Frameworks *vis-á-vis* World Commission on Dams Strategic Priorities', IUCN, Bangkok, Thailand and Gland, Switzerland.

[9] Professor Mohan Munasinghe in his keynote presentation at the TA's first planning workshop also recommended to the ADB the need for a multi-stakeholder, multi-level consultation process, in the context of the 'Sustainomics' paradigm and the Action Impact Matrix methodology. Professor Munasinghe also recommended the use of 'neutral forums to provide sustained inputs to decision processes'.

participants and composed of regional governments, donors and civil society that would oversee and implement the regional energy planning process. Establishing a multi-stakeholder steering committee ensures transparency and inclusiveness that lends legitimacy and buy-in to the process by all participating stakeholders. Once formed, the initial task of the multi-stakeholder steering committee would be to define an agreed-upon methodology for a participatory regional energy needs and options assessment process.

In direct contrast, the TA's steering committee is formed of members from the Energy Sector Forum (ESF), a regional inter-governmental group formed under - and receiving support from - the ADB's GMS program[10]. Civil society and other stakeholders are not invited to attend these meetings. Whilst the ESF is yet to hold its inaugural meeting, its precursor, the Electric Power Forum, vigorously pursued the regional integration vision led by ADB with no input from civil society and other stakeholder groups, and allocated very little time to investigating energy efficiency measures, demand side management, and renewable energy alternatives.

There are other issues that arise from this inbalance in the TA steering committee. ADB staff designed the TA with no stakeholder participation, thus pre-determining the format and agenda of the study[11]. Likewise, ADB staff selected the TA consultants without consultation with external stakeholders. ADB is also the Executing Agency, and the TA secretariat is formed of ADB staff rather than independent consultants. Finally, the ADB staff handpicked the membership of the Expert Panel with no stakeholder consultation. Under these circumstances it is difficult to see how an objective and credible study can be conducted without the undue influence of the ADB's own development agenda.

In presenting the design of the TA's consultation process, the Project Inception Report (PIR)[12] would appear to identify three formal consultation stages, namely at 'information gathering' (*stage 1*), 'feedback on scenario results' (*stage 3*), and 'dissemination' (*stage 5*). The PIR provides very limited details on how the consultations will be conducted. Consultations are implied, however, to not be inclusive of all stakeholders. For example:

- Regarding the 'feedback on scenario results', the PIR writes that 'After the model runs are complete … [results] will have to be discussed and analyzed. At this stage of the project work, IRM, the domestic experts, local policy makers and potential investors will assess the MESSAGE results…'.
- Regarding the 'dissemination', the PIR writes 'A draft final report summarizing all project findings will be prepared and presented to the ADB as well as to officials of the GMS countries for review. *Their* comments and recommendations will be reflected in the final project report [emphasis added]'. In contrast, the PIR

[10] Governmental officials that are members of this committee include representatives from each GMS Government's Ministry of Energy and electricity utility.
[11] It should be noted that at the time of development, the ESF was yet to be formed. Presumably the Electric Power Forum, which focuses on the Power Sub-sector rather than the Energy Sector, was consulted in its place. The ESF will hold its inaugural meeting in October 2006.
[12] Integriertes Resourcen Management, (2006). 'Developing the Greater Mekong Subregion Energy Sector Strategy: Inception Report – Discussion Draft', *Asian Development Bank, June 2006.*

> goes on to write 'Other *dissemination* activities will include the preparation of one or more presentations *summarizing the findings* of the project for use at seminars, workshops and other similar activities [emphasis added]'

There is no reference to multi-stakeholder consultations within the PIR, although this is contradictory to the TA report, which writes 'The TA will be implemented in a fully participatory way and will include national and regional workshops and consultations with energy experts, government officials, civil society organizations, private sector, other aid agencies, and regional groups'. Ms. Rita Nangia, TA Project Leader and Director, Special Projects Southeast Asia Department, at the TA's First Planning Workshop stated that there would be three regional workshops (Planning workshop, Results workshop, Draft Strategies workshop), although further details were not provided. These workshops are not noted in the process described in the PIR. The proposed national and regional workshops, however, are to be organized by regional government counterpart agencies and are therefore unlikely to provide a neutral forum for discussion. No mechanism to ensure that all stakeholders' inputs into the process are openly considered and accounted for is detailed.

There is also no commitment made in the PIR regarding what information/ data collected in the course of the TA will be made publicly available. Public scrutiny of data that forms the basis of the modeling aspects of the TA would be pre-requisite to meaningful participation. The PIR also implies that the selection of scenarios to be run by the MESSAGE program - which determine the scope of options available for discussion later in the TA - will be left to the consultants and not developed in a participatory manner. Regarding the scenarios, no details are provided of how many scenarios will be run nor whether the data assumptions for each scenario will be made publicly available. Finally, the use of commercial software (MESSAGE) rather than software in the public domain precludes evaluation of the consultants' modeling results by independent modeling experts[13].

In the absence of a meaningful participatory process, institutional and regulatory bias at both a regional and national level will fundamentally influence the outcome of the TA. The ADB's E-Paper on Dams and Development acknowledges that "Investing more time up front in deciding on policy initiatives, determining investment strategies and selecting appropriate project interventions can yield significant benefits in reducing social and environmental costs later in the project cycle." [14] The ADB has an opportunity now to put this commendable principle into practice by revising the current TA and supporting civil society's call for a Comprehensive Energy Options Assessment to be conducted for the GMS region.

Internalization of external costs

Critical to the 'least-cost plus' approach proposed by the TA is internalization of external costs. Yet accurately ascribing monetary values to environmental, transboundary and

[13] A widely applied public domain software package, already used by various groups in the Mekong region, is the Long-range Energy Alternatives Planning (LEAP) model

[14] http://www.adb.org/water/topics/dams/dams0225.asp

social impacts resulting from energy production is an almost insurmountable task. The limited state of current scientific knowledge, for example on the cumulative transboundary impacts of proposed dams on the Mekong River's hydrology and socio-ecological systems, precludes accurate economic valuation. If valuation of environmental and social impacts is applied inconsistently between different energy technologies, with some evaluated more comprehensively than others, this then will skew the overall least-cost analysis.

In the absence of reliable economic valuation of environmental and social impacts, *qualitative yet systematic and consistent* methodologies must be uniformly applied for objective comparison of energy technologies for a particular system. The use of non-monetary indicators are central to this analysis and a suite of standardized, integrative analytical tools are available for this task. Professor Munasinghe, in his key-note presentation on the 'Sustainable Energy Development' framework, outlined many of these tools that should be used concurrently, and include[15]:

- Cost Benefit Analysis (Economic/ Financial Assessment)
- Environmental, Social, Poverty and Technical Assessments
- Sustainable Development Indicators
- Multi-criteria analysis

The selection of appropriate, location-specific indicators is critical to successful analysis. Also important to the analysis is the full participation of stakeholders who provide the values system within which the indicators are evaluated[16].

In contrast to this rigorous approach that integrates monetary and non-monetary analysis within a systematic framework, the PIR is ambiguous on its analysis of social and environmental factors. The consultants' proposed methodology seems to be:

1. Development of scenarios using 'qualitative descriptors' ('favorable', 'high', 'low') to develop a story line. The consultants will choose numerical inputs for the MESSAGE computer program corresponding to each qualitative descriptor, although no explanation is provided as to how one will be equated to the other. The program will then be run to determine least-cost energy strategies under each scenario.
2. 'After the model runs are complete…IRM, the domestic experts, local policy makers and potential investors will assess the MESSAGE results from various socio-economic and environmental perspectives. These include social equity (e.g., poverty alleviation, job creation, relocation of populations), pollution (e.g., acid

[15] The World Commission on Dams is also instructive in this regard, recommending that Strategic Impact Assessments for Environmental, Social, Health and Cultural Heritage issues be conducted as a part of the Comprehensive Options Assessment process[15]. The report also goes on to recommend: Multi-Criteria Analysis; Life-Cycle Assessment; Distributional Analysis of Projects; methodologies for the Valuation of Social and Environmental Impacts; and recommendations on how to improve Economic Risk Assessment.
[16] Professor Munasinghe provided case studies where this methodology has been applied at different scales (global, national, sub-national, and project)

> rain and greenhouse gas emissions), deforestation, desertification, and the probability of natural disasters…'.

No reference is made in the PIR or TA report to the systematic application of non-monetary indicators and associated analysis tools. As such, the social and environmental analysis as proposed under the TA would appear entirely *non-systematic* and *dependent on the subjective opinions of hired experts*. Overall, there would appear to be a bias towards computational modeling and financial analysis in the methodology, over incorporation of environmental and social impacts. It furthermore appears that significantly more effort is being expended gathering energy statistics and economic data than environmental and social impact data.

The proposed methodology therefore appears neither rigorous nor substantive in its treatment of environmental and social impacts arising from energy sector strategies, and it is difficult to see how the study will integrate economic, social and environmental factors to arrive at credible recommendations.

An integrated approach to energy planning is not adopted

At the First Planning and Consultation Meeting for the TA, there was considerable discussion regarding how Energy Efficiency (EE) and Demand Side Management (DSM) for the GMS region's power sub-sector would be incorporated into the TA's least-cost analysis. For energy efficiency, the IRM consultants explained that EE could be integrated into the MESSAGE model either as a low-demand scenario or improved technical efficiency of energy conversion technology. It was not made clear whether DSM would be treated in a similar manner.

However, the broader issue regarding from what source EE and DSM values would be derived remained unaddressed. The consultants appeared to imply at the meeting that values for DSM and EE would be accounted for by each GMS country's power demand forecasts, which would be provided by GMS government counterpart agencies[17]. In other words, it seems the consultants would argue that there is no need to disaggregate the DSM and EE data from the demand forecast. Yet not treating DSM and EE as separate variables within the analysis would result in a non-optimization of these variables in the final least-cost analysis.

It is commonly best international practice to adopt the practice of Integrated Resource Planning (IRP), which considers a full range of feasible *supply side and demand side* options and assesses them against a common set of planning objectives and criteria aiming for lowest economic cost[18]. Demand side measures are often cheaper and faster to come online than constructing new power plants, and entail negligible, if not positive, social and environmental impacts. Numerous projects and studies have demonstrated

[17] A power demand forecast represents a bundled account of supply and demand management factors, together with other growth variables, that result in a net prediction for future power demand.

[18] *e.g.* The Tellus Institute (undated) 'Best Practices Guide: Integrated Resource Planning for Electricity' www.goodcents.com/info/best%20practices%20guide_IRP%20planning.pdf

significant potential for energy efficiency and demand side management in the region, in particular in Thailand and Vietnam where energy demands are greatest[19].

In Thailand, for example, according to a recent EGAT study the cost of supplying energy by constructing new plants was 5.0 US cents per kilowatt hour compared with 1.3 cents per kilowatt hour by adopting DSM[20]. Thailand has implemented an Energy Efficiency program since 1995, and has several active research programs, for example the Energy Policy Research Project at the Joint Graduate School of Energy and Environment (JGSEE)[21]. A World Bank-commissioned report in 2005 placed the achievable amount of DSM and EE in Thailand by 2011 at 2,207 MW (peak) or 11,181 gigawatt hours per year[22]. In Vietnam, Electricity of Vietnam is presently implementing phase 2 of its DSM Program financed under a GEF grant[23], and a recent report from the project identifies significant potential savings[24].

The ADB itself claims to be supporting EE both under its 'Energy Efficiency Initiative' launched in June 2006, as well as through numerous other projects in the region such as PREGA[25]. Yet, despite significant potential for the region, the TA would appear to adopt a more traditional energy sector planning methodology by emphasizing the evaluation and promotion of supply side measures to meet the region's energy needs.

Limitations in the availability and quality of data

Models are only as good as the data that is analyzed. The availability, accuracy and quality control of data used in the study will be critical both to the computational modeling aspects, as well as the broader environmental and social valuation components. The PIR openly admits that the degree of detail of the study, as determined by the availability and comprehensiveness of suitable data, is presently unknown. Predicting future energy trends is inherently uncertain and the PIR itself identifies several data limitations and unknowns, such as the phenomenon of 'leap-frogging'[26]. Regarding quality control of the data to be provided by GMS countries, the consultants proposed two mechanisms, namely: Domestic experts and project country coordinators will verify

[19] However, for countries whose utilities are operating under monopoly conditions and cost-plus financing arrangements, such as Thailand, there is little impetus to implement demand side management programs or to improve system efficiency.

[20] Untitled EGAT study (2001) cited by Peter du Pont, Ph.D. (2006) 'An Overview of Energy Efficiency Programs and Opportunities in Thailand', presented at *Renewable Energy: Technology and Market in Southeast Asia* 6-7 July, 2006, Bangkok, Thailand.

[21] http://www.thaienergy.org/

[22] Danish Management Institute (2005), 'Nam Theun 2 Hydropower Project: Impact of Energy Conservation, DSM and Renewable Energy Generation on EGAT's Power Development Plan', prepared for World Bank.

[23] http://web.worldbank.org/external/projects/main?pagePK=64283627&piPK=73230&theSitePK=40941&menuPK=228424&Projectid=P071019

[24] Danish Energy Management (2006), 'DSM Screening Plan: Assessment of Priority DSM Measures for Vietnam for Vietnam's Phase 2 DSM Program 2004-2007', prepared for Electricity of Vietnam

[25] 'Promotion of Renewable Energy, Energy Efficiency and Greenhouse Gas Abatement' (PREGA) project, which conducted studies in 15 Developing Member Countries, including Cambodia, Laos and Vietnam.

[26] The recognition that development does not have to follow the same technological path as in other, further developed countries

accuracy of data; and plausibility checks would be conducted against global data. Whether these steps are adequate will be seen only once the TA is under implementation[27].

There are, however, some broader issues related to data accuracy that are already well-documented. Several commentators have identified that Thailand's base-case forecasts prepared by the Thai Load Forecast Sub-committee (TLFS) consistently overestimate actual power demand[28]. According to a recent analysis, all nine of the base-case forecasts prepared by the TLFS over the past 13 years have over-estimated current power demand, sometimes by as much as 48 percent. Furthermore, even the most recent forecast, issued in April 2006, has already over-estimated actual demand by 900 MW and will likely over-estimate future demand by at least 6000 MW, potentially leading to an over-investment of around 400,000 million Baht[29]. It is noted in the TA report that the TA 'will construct demand forecasts', although it is not made clear to what extent this will depend on national data or national demand forecasts[30]. Power demand in Thailand is one of the principal drivers for expansion of the regional power markets, and for that reason realistic projections are critical to avoid costly over-investment in infrastructure. It is important, therefore, that the TA incorporate realistic demand forecasts into the MESSAGE model. For Laos and Cambodia, where power markets are presently small but in transition, predicting accurately the long-term rate of growth is almost impossible.

In order for the model to appear credible to observers, the TA should disclose all data utilized by the study, such as assumed demand forecasts, energy production costs for each technology, rates of market penetration, and internalized external costs. The cumulative magnitude of error of the results of the MESSAGE model arising from the degree of error in the datasets should be clearly presented, together with model sensitivity analysis. This will clarify the degree of uncertainty of the model results which must be borne in mind when evaluating the computer model results for each scenario and the associated policy recommendations. The likely magnitude of uncertainly of the computer model results should be presented in a way easily understood by lay-persons not familiar with computer modeling techniques.

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[27] Whilst data quality would be an issue under any regional energy planning exercise conducted, including under a Comprehensive Energy Options Assessment (CEOA), it is arguable that under a CEOA overall data quality could be expected to be significantly improved because there would be greater buy-in from stakeholders (increasing cooperation in data provision) and wider diversity of opinion and expertise (acting as an improved data vetting and evaluation mechanism)

[28] *e.g.* see Permpongsacharoen , W. (2004) 'An Alternative to Thailand's Power Development Plan (PDP)', The National Economic and Social Advisory Council.

[29] The TA report (paragraph 6) states national level energy forecasts in the GMS region to be rising at between 7% and 16% per annum. However, in the case of Thailand, which is the main market for export-driven electricity market growth in the region, EGAT recently revised its anticipated growth rate to only 4.5% this year down from 6.5% ('Power demand forecast cut' by Yuthana Praiwan. Bangkok Post. 2 August 2006)

[30] Recall from above, ADB management in the letter addressed to IRN on 10th March 2006 wrote 'developing realistic demand projections… were very much in our mind when we prepared the TA design, and will certainly guide our thinking during the study period'.

Assumption that regional integration is the least cost approach

Despite the TA's mandate to assess *whether* regional cooperation is the best least-cost approach, according to the TA report the stated aim of the TA is 'to develop a regional strategy to expand cooperation among the GMS countries' and therefore pre-supposes any conclusion that might be derived from the least-cost analysis. In fact, there is a clear assumption within the language of the TA report that regional energy cooperation will be the resulting least-cost option identified by the consultants as most favorable[31].

This bias towards regional integration is also consistent with ADB's core approach to development. For example, the ADB's 2000 Energy Policy review recommended as one of four operational priorities promoting regional cooperation[32]. However, a Special Evaluation Study on ADB's Energy Policy prepared by the ADB's Operations and Evaluation Department writes that 'Regional co-operation in energy transmission and sales have commenced but with only limited success'[33]. The Position Paper goes on to write 'Regional Technical Assistance (RETAs) grants for international trading of energy have total $11.1 million and $11.8 million in the periods 1995-1999 and 2000-2005, respectively, with few tangible results'.

The ADB has promoted regional electricity markets or a 'Mekong Power Grid' (MPG) under the GMS program since the early 1990s. Whilst several regional agreements have been signed amongst GMS governments, progress has been slow and it is questionable whether the overall goal of regional power pooling is either realistic or economic. In an analysis commissioned by Thai NGO Palang Thai, Dr. Bretton Garrett, a Canadian electrical engineer of considerable experience, outlined several major concerns regarding the overall concept of regional power trade. Primarily, Dr. Garrett questioned the wisdom of committing to an expensive, long-term electricity trade arrangement without certainty of economic benefits[34]. For an investment of more than US$43 billion the total expected benefits would amount to only US$914 million, which represents a saving of just over 2% compared to the non-project scenario. Furthermore, because the costs of the hydropower schemes proposed under the MPG are at present unknown, the economic viability of the entire plan is based largely on speculation and assumption. Garret also points out that harmonizing electricity generation and transmission operations across the Mekong region presents a formidable technical and political challenge for the GMS countries. Failure to cooperate closely on both levels risks large-scale blackouts and damage to expensive equipment.

Whilst regional integration *per se* may not be a bad thing, in the absence of sufficient governance safeguards significant transboundary, environmental, and social risks are

[31] For example, in the design and monitoring framework of the TA, indicators include 'cross-border energy trading among GMS countries [is] increased by 10% during 2006-2020' and 'cross-border investment in energy infrastructure among GMS countries [is] increased by 10% during 2006-2020'.
[32] ADB, (2000). 'Energy 2000: Review of the Energy Policy'. Published by ADB, Manila.
[33] Schenck, R. (2006), 'Special Evaluation Study on ADB's Energy Policy – Position Paper' *Published by Asian Development Bank, June 2006*
[34] Garrett, B.W., (2005). 'Comments on Study for a Regional Power Trade Operating Agreement in the Greater Mekong Subregion, TA 6100-REG, Final Report', Discussion document commissioned by Palang Thai, Bangkok

incurred. Correctly, the TA report (paragraph 9) writes that 'There is also a need to enhance the institutional and policy framework to integrate environmental and social costs in energy projects at the regional level'. In the absence of such safeguards, it is irresponsible of the ADB to promote further high risk energy infrastructure in the region.

Will the private sector improve efficiency and pass on these benefits to consumers?
An important stated output of the TA is the identification of priority projects for private sector financing to enhance energy trade and investment in the region[35]. The TA report considers that 'at present GMS's various energy subsectors are dominated by public ownership'. The TA argues that private sector participation should be expanded both to mobilize financial resources and to enhance overall use efficiency, although this position is misleading. Whilst it may be true that the private sector will strive for efficiency to reduce their costs, under the current regulatory environment found in the GMS, there is little incentive for private producers to encourage consumer/end-use energy efficiency considering they get their profits from selling more power[36,37]. Strong, independent regulators with government oversight are the only way to prioritize energy efficiency over additional supply. Whilst the TA is charged with proposing regulatory mechanisms for regional energy markets, the word *independent* is ominously absent. There is also, furthermore, an increasing body of evidence to indicate that private sector energy companies operating in countries such as Laos and Burma are not adopting international standards of best practice[38,39].

Prior to promoting private sector investment in the energy sector through the current TA, the ADB should ensure that the appropriate national and regional policy, legal and regulatory frameworks are in place, together with monitoring and compliance

[35] Were market-mechanisms working correctly, there should be no need for the consultants to identify priority investment projects for the private sector.
[36] For example, a key concern of the MPG plan is the apparent inequitable allocation of risks and benefits between electricity producers and consumers. Dr. Garrett points out that whilst consumers would shoulder the initial cost and risk of investment in the construction of regional transmission infrastructure, in the absence of a competitive, regulated marketplace for buying and selling power through the MPG it will likely be the generation companies that reap any economic benefits from savings in generation costs. Absent from the MPG plan is the timely establishment of a truly independent regulator that would ensure that generation and transmission grid operators pass on any reduced costs to the consumer.
[37] Despite the presence of IPPs in Thailand, the Electricity Generation Authority of Thailand (EGAT) currently operates uses a 'cost plus' arrangement where there is little incentive for overall efficiency to be improved because the consumers are a captive market and therefore are forced to pay whatever the going rate is for electricity.
[38] For example, under the Nam Theun 2 project, supported by ADB, the Government of Laos adopted a 'National Policy on Environmental and Social Sustainability of the Hydropower Sector'. This policy was developed to ensure that subsequent investments in the hydropower sector in Laos, which it was anticipated the Nam Theun 2 project would promote, would be developed according to a minimum set of social and environmental standards. The policy commits the GoL and/or project developers to produce a full Environmental Impact Assessment, Environmental Management Plan and Resettlement/Social Development Plan for all large hydropower projects. In addition, these documents are to be disclosed publicly, and consultations must be conducted with all project-affected communities. Despite the advanced stage of development of Nam Ngum 2, Nam Ngum 3, Xe Kaman 3 and Nam Theun 1 hydropower projects, these documents have not to date been disclosed.
[39] In Burma, the proposed development of a cascade of hydropower dams along the Salween River for electricity export to Thailand, under public-private partnership, has exhibited dubious process to date.

mechanisms, to ensure international standards are adopted under which the private sector would operate.

Will the regional energy strategy prioritize the needs of the poor?
It is stated in the TA report that over 50 million people in the Mekong region presently lack access to electricity. In countries such as Cambodia, 70% of the rural population lack access. There is a strong link between access to energy services and improving livelihoods. Therefore, a priority of the regional energy strategy should be to provide energy services to the poorest of the region. The MESSAGE model appears to be adapted primarily to a centralized model of energy production and supply. Decentralized energy networks, commonly fueled by renewable energy sources, offer the most cost-effective solution in regions where populations are dispersed or access is difficult[40,41]. It is not clear, therefore, whether the model is capable of evaluating the potential for decentralized energy in the region, and if it is, whether suitable scenarios will be run.

The TA limits its effectiveness by not integrating with existing initiatives in the region
Considering the expansive scope of issues to be addressed by the TA the proposed time-line, totaling 10 months from June 2006, appears ambitious for a meaningful study to be prepared and agreed amongst participating stakeholders. Well-respected regional experts on energy sector planning highlighted at the First Planning Workshop that the TA makes no effort to build upon existing computer modeling initiatives, some of which have been on-going for years. It was questioned how such a short-term study will add value to these existing research programs, especially the national programs of Thailand and Vietnam.

Is the MESSAGE software the most appropriate for this study?
The decision to use the commercial MESSAGE software rather than the public domain software often used by researchers in the region (*LEAP*) calls into question the long-term usefulness of the project results. In particular, without paying for software licenses and gaining training in the use of MESSAGE, many GMS region energy planners and researchers will not be able to build upon the findings of this research by expanding the model's application.

Regarding the GMS power sector, much of the supposed future benefits from regional power trade and interconnection that is currently promoted by the ADB will be derived from power sharing due to differences in peak loads, in particular between Vietnam and Thailand. To model this requires software that can account for these diurnal differences.

[40] For example, the Renewable Energy Action Plan (REAP) was a document funded by the World Bank's Energy Sector Management Assistance Program (ESMAP) in order to encourage the generation of electricity from renewable energy sources in rural regions in Cambodia (http://www.recambodia.org/reap.htm)

[41] In a World Bank Press Review release (newsbureau@worldbank.org) on 7.9.06, World Bank Energy Director Jamal Saghir is reported as saying to Reuters 'Investments in offgrid energy generation projects are the quickest way to get electricity to the 1.6 billion people in the world without lights' and '[World Bank] have been very aggressively moving on renewable energy and energy efficiency, but the least-cost solution is not always affordable because the cost can be high in remote areas … On the other hand, sometimes it is the only solution for remote, small villages. I see a lot of offgrid renewable technologies for clinics, for health services, for lighting for education, and we should see more and more of this,'

The MESSAGE software does not appear to do have the capacity to model at this temporal scale, thus limiting its applicability.

Conclusions and recommendations

GENERAL RECOMMENDATIONS

Participation

The ADB is commended for recognizing the need for adopting a participatory process in developing the Regional Energy Sector Strategy. Furthermore, the development of a project website for information dissemination demonstrates an increasing commitment of ADB to raise awareness about its work with a wider range of stakeholders. However, in final analysis the TA consultation process is demonstrated to fall short of international standards that could be ascribed as truly participatory, such as those recommended by the World Commission on Dams. Central to the TA's shortcoming is the absence of a multi-stakeholder steering committee, present from the conception of the TA, to develop a participatory process. Other limits to participation include the non-consultation of all legitimate stakeholders identified through a 'rights and risks' assessment, and the absence of neutral meeting venues.

IRN recognizes that it is too late to cancel the present TA. Furthermore, some useful analysis may result from the current TA that could feed into a CEOA process if changes are made to the design. Therefore, IRN recommends:

- The TA should be revised to adopt the specific recommendations made within this paper.
- Clarification should be provided on the proposed consultation process under the current TA, including explanation of how participant's comments will be considered within the final reports of the TA.
- The TA should not attempt to prepare a definitive Regional Energy Sector Strategy as currently proposed. Instead the outputs of the TA should be treated as a precursor to a Comprehensive Energy Options Assessment for the GMS.
- The ADB should commit to support a Comprehensive Energy Options Assessment for the Greater Mekong Subregion in the immediate future in line with the recommendations of the World Commission on Dams, and as called for in January 2006 by 30 NGOs.

SPECIFIC RECOMMENDATIONS

Internalization of external costs

In identifying the need for the internalization of external costs, in particular transboundary, social, and environmental costs, the ADB has recognized the need to address inequities in energy sector development. However, the methodologies proposed in this TA are non-systematic and weak. Furthermore, there would appear to be an inequality between effort expended on collecting technical energy data and that expended on data regarding social and environmental impacts. The TA would benefit from

increasing the depth and quality of this analysis and IRN makes the following recommendations:

- Invest further effort in collecting credible social and environmental data that would appropriately inform the TA's analysis
- Develop a rigorous methodology for internalizing non-monetary external costs, using the concurrent application of appropriate tools including: Cost Benefit Analysis (Economic/ Financial Assessment); Environmental, Social, Poverty and Technical Assessments; Sustainable Development Indicators; and Multi-Criteria Analysis

Evaluation of demand side potential

GMS governments, the ADB, and its development partners have all articulated various commitments to Energy Efficiency and Demand Side Management. The TA is also charged with evaluating the potential for EE and DSM, and numerous comments were raised at the First Planning and Consultation Meeting regarding this task. There remains, however, a lack of clarity on the process by which the potential for EE and DSM will be evaluated. IRN recommends:

- The potential role of EE and DSM should be extensively researched for each GMS country, including pro-actively communicating with existing national level programs and research institutes
- In evaluating supply side and demand side options the principles of Integrated Resource Planning should be applied

Data quality and disclosure

Accurate, thorough data will be a vital factor in the TA's success. However, there is considerable uncertainty at present regarding how much data exists, how much data will be made available to the TA, and the quality of the data. Furthermore, the TA's data quality control mechanisms are not proven. Therefore, IRN recommends:

- Significant effort should be expended to determine accurate energy demand forecasts for each GMS country, in particular for Thailand and Vietnam
- Data quality control mechanisms should be developed and proven to effectively exclude weak data
- All data utilized by the study should be publicly released to ensure transparency and accountability.
- Assumptions and conditions for each scenario's computer simulation, together with sensitivity analysis, should also be publicly disclosed in a readily understandable format.
- The degree of uncertainty in the computer simulation results should be presented in a readily understood format, so as to reflect the degree of risk/ unknown in selecting particular policy scenarios.

Assumptions towards regional integration

The clear bias within the TA design towards promoting regional integration for the energy sector is not founded on rigorous analysis. This paper questions the ADB's assumptions towards promoting regional integration in the energy sector in the absence of strong environmental and social safeguards that would mitigate transboundary, environmental, and social risks. The paper furthermore points out that it remains unproven that regional integration of the energy sector is either the cheapest or most effective way of providing energy services to the people of the Mekong region. IRN therefore recommends:

- Regional integration should not be promoted until it has proven to be the best solution for the region through a CEOA process.
- The TA should explore regulatory and policy tools that would ensure protection of the environment and livelihoods before any further high-risk energy sector development projects are considered.

Private sector involvement

IRN questions the ADB's assumption that increasing the role of the private sector will lead to improved efficiencies that will benefit consumers. Only the presence of strong, independent energy sector regulators in the region can ensure both demand side and supply side efficiency, and ensure that risks and benefits arising from energy sector developments are equitably distributed amongst different stakeholder groups.

- ADB should not promote access to the energy sector by the private sector in the absence of independent, empowered regulatory bodies.

Technical capacity of the MESSAGE computer model

Several technical issues regarding the applicability of the MESSAGE model to the GMS energy system are raised in the paper which should be clarified by the consultants, namely:

- Is the MESSAGE model able to effectively integrate centralized and decentralized modes of energy production? How will the MESSAGE model evaluate the potential role of decentralized and renewable energy production, in particular in Cambodia and Laos?
- Is the MESSAGE model able to incorporate proposed benefits from power trading that is suggested to arise from diurnal differences in peak demand mainly between Vietnam and Thailand?