2011:9 Sida Review

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Review of the Greater Mekong Sub-Region Regional Power Trade

Final Report

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ACRONYMS

ADB	Asian Development Bank
AFD	Agence France de Développement
ASEAN	Association of Southeast Asian Nations
BOT	Build – Operate – Transfer
CA	Concession Agreement
CEERD	Centre for Energy Environment Research and Development
CEP	Core Environment Programme
CSG	China Southern Power Grid
EDC	Electricité du Cambodge
EDL	Electricité du Laos
EGAT	Electricity Generating Authority of Thailand
EIA	Environmental Impact Study
EOC	GMS Environment Operations Centre
EPPO	Energy Policy and Planning Office
ERAV	Electricity Regulatory Authority of Vietnam
ERC	Energy Regulatory Commission
ESMAP	Energy Sector Management Assistance Programme
EVN	Electricity of Vietnam
FS	Feasibility Study
GHG	Greenhouse Gas
GMS	Greater Mekong Sub-Region
IFC	International Finance Corporation
IFI	International Financing Institution
IGA	Inter-Governmental Agreement
IPP	Independent Power Producer
kV	kilovolt
MoNRE	Ministry of Natural Resources and Environment
MOU	Memorandum of Understanding
MRC	Mekong River Commission
NESDB	National Economic and Social Development Board
NPT	National Power Transmission Corporation
NTPC	Nam Theun Power Company
PDP	Power Development Plan
PPA	Power Purchase Agreement
RETA	Regional Technical Assistance
RPCC	Regional Power Coordination Centre
RPT	Regional Power Trade
RPTCC	Regional Power Trade Cooperation Committee
RPTOA	Regional Power Trade Operating Agreement
SEA	Strategic Environmental Assessment
SAPP	Southern Africa Power Pool
Sida	Swedish International Development Cooperation Agency
SOE	State-owned Enterprise
THPC	Theun Hinboun Power Company
TOR	Terms of Reference
TSO	Transmission System Operator

1. EXECUTIVE SUMMARY

Asian Development Bank (ADB) has actively supported the regional integration and economic development in the Greater Mekong Sub-region (GMS), including building institutional and physical infrastructure for regional power trading, since the early 1990s. Sida has been a partner to the GMS Power Trade process since 2008, providing a grant financing of USD 5 million for ADB's Regional Technical Assistance 6440 -"Facilitation of Regional Power Trading and Environmentally Sustainable Development of Electricity Infrastructure in the GMS".

Sida has initiated a review of its support to RETA 6440, but at the same time the review mission has been advised to look at the actual RPT process as a whole. The main objectives of the review, as described in detail in the Terms of Reference (Annex 1) are the following:

1. To review and assess the progress of the RPT process so far;
2. To briefly review and assess the outputs and outcomes of RETA 6440;
3. To give recommendations on the way forward.

The review has been carried out by a team of three evaluators during October/November 2011. The field work included visits to four (out of six) GMS countries, plus a visit to ADB in Manila (see Annex 2). More than 60 persons were interviewed in actual meetings or through telephone or videoconference (see Annex 3). The team had a chance to attend the meeting of the Regional Power Trade Coordination Committee (RPTCC) in Ho Chi Minh City on November 9-11, and present its initial findings to the participants.

The economic development and energy situation in the six GMS countries differ greatly: China (Guangxi and Yunnan provinces), Thailand and Vietnam are large developed countries, which are in need of imported energy, whereas Myanmar, Laos and Cambodia are economically small developing countries with a very large potential for hydropower generation (Myanmar and Laos especially). The current situation with the power trade is that most of the cross-border sales are Independent Power Producers (IPPs) selling power directly to the neighbouring country through a transmission line dedicated for their own use only.

Important documents in the RPT process have been the Inter-Governmental Agreement (IGA) from 2002 and two subsequent MoUs from 2005 and 2008. The IGA was to implement the Policy Statement on Regional Power Trade endorsed in 2000, and to establish a framework for the advancement of regional power trade in the GMS. The RPTCC was established as a high-level body to coordinate the successful implementation of the regional power trade. The MoU-1 sets out the guidelines and conditions to be followed in bilateral trading, and the MoU-2 is so-called Road Map for reaching more advanced stages of the power market and trade.

The conclusion of the Review Team, regarding the progress and status of the RPT, was that although some progress has been achieved, the regional power market is not really closer than what it was when the IGA was signed in 2002. This is mainly due to the lack of transmission infrastructure in the smaller countries, and the absence of a legal and regulatory framework in some of the countries. All the countries are not necessarily ready to proceed in the direction of a free electricity market.

The private sector currently plays a major role in the development of new generation capacity in the area. This situation is causing additional challenges to the RPT: the IPPs have typically Concession Agreements (CAs) and Power Purchasing Agreements (PPAs) for 25-27 years, and dedicated power lines for the evacuation of power to the neighbouring country. The transmission line can have available spare capacity for trading, but the agreements limit the use of the line for any third party access.

RETA 6440 had two components: "Facilitation of development of the RPT," and "Capacity development for environmental impact assessment of power projects." The Review Team reviewed the objectives of RETA 6440 (11 in all) and found that the objectives were not particularly well-formulated, and at least some of the countries complained that they did not have a chance to discuss the contents. Also it appears that the two components of RETA 6440 were not adequately integrated, and even the modules of Component 1, obviously done by different consulting firms, seem to lack internal consistence.

Component 1 of RETA 6440 included five different modules, the first module being the Update of the GMS Regional Master Plan. The following modules consisted of separate studies, 1...5 pieces in each module. The main studies in Component 2 were dealing with SEA and EIA/EMP analysis, as well as a Recommended Environmental Management and Monitoring Plan (EMP) and Social Development Plan (SDP). Furthermore an Update of the RPTCC Road Map for Cross Border Trade was prepared as a joint exercise for Component 1 and 2.

Several of the original objectives of RETA 6440 relate to capacity building. This was mainly achieved through various workshops and study tours. Whereas the study tours, especially the one to Southern Africa Power Pool (SAPP), were considered useful, it remains an open question whether the large workshops using primarily lectures plus some group discussions would count as "capacity building".

The objectives of RETA 6440 were obviously too many for one project, to be implemented effectively in short time. An issue mentioned by a number of GMS country representatives is that while the knowledge and expertise of the consultants was appreciated, it was also felt that they did not have adequate grounding in the real situation of the GMS. Thus, much of their knowledge could not be "transferred" and applied. Comparing the results and the original expectations of Sida (Assessment Memo, October 2007), the conclusion was that only one out of seven expected outputs was completed in full, the other outputs were not really achieved.

The consultants of RETA 6440 have worked hard and produced a vast amount of useful documentation. At the same time the project did less than expected to facilitate the process of working toward a regional power market, mainly because of the initial design of RETA itself. The conclusion is also that the MoUs and the Road Map were also not adequate in defining concretely what steps would need to be taken where, by whom and when. Thus, after over ten years of ongoing discussions on a regional power market, Stage One has not yet been reached fully.

The RETA 6440 Consultant Team has made a long list of recommendations and sub-recommendations, but the most important one by far is the set of recommendations to set up a GMS Regional Coordination Centre, or as it is now referred to: GMS Regional Power Coordination Centre (RPCC). The consultants recognised that without a permanent secretariat on power trade, the many different studies and recommendations that were made would not be effectively followed up.

It is expected that the RPCC, by virtue of being funded by the member countries, will be able to engender a higher sense of ownership and commitment to the process of establishing a regional power market than has been the case to date. An important point on the RPCC functioning that has not been included is the capacity building and institutional development aspects (the consultant team only recommended capacity building to enhance planning skills in the GMS, which is only a small part of what is required). The major challenge in establishing a GMS Regional Power Market is the difference of the energy sector development, including the structuring of markets in each country and the lack of an institutional set-up (e.g. regional cooperation between independent regulators and independent TSOs).

A Regional Power Market cannot operate without an adequate transmission infrastructure, so substantial expenditure is needed, especially in the smaller countries (Myanmar, Laos and Cambodia). Institutional and regulatory frameworks are also in vastly different stages from one another.

Thus, the big question that remains is whether a regional power market is achievable as it was conceptualised in the mid- to late-1990s. GMS country representatives with whom the Team spoke all say that this regional power market is a distant goal. Whether it is 20 years or 30 years in the future, it is clear that it will not happen without many national and regional efforts. In the final analysis, the countries with hydropower to export — Laos, Cambodia and Myanmar — stand to lose the most if a regional power market is not put in place.

2. INTRODUCTION AND BACKGROUND

The concept of Regional Power Trade (RPT) was initiated as one of the core issues under the Asian Development Bank's (ADB) support to both the regional integration and economic development of the Greater Mekong Sub-region (GMS).[1] This began in the early 1990s. An important milestone for regional integration was the signing of the Inter-Governmental Agreement (IGA) on Regional Power Trade in the GMS in November 2002. This agreement has been followed by two Memorandums of Understanding (MoUs), in 2005 and 2008. These two MoUs encompass a Regional Power Trade Operating Agreement (RPTOA) and a Road Map with milestones to achieve a regional power market. There is high-level commitment from GMS Ministers to guide their countries to greater participation in a regional power market. Nonetheless, this goal remains to be achieved in the long term.

ADB's facilitation support to establishing a regional power market largely encompasses a series of regional technical assistance projects (RETAs) that have been co-financed by Sida and the Agence France de Développement (AFD). Some related lending for power generation and transmission has also taken place. ADB Manila has been acting as a secretariat for the RPT from 2002 to date. The World Bank Group has also played a role in the form of studies, capacity building and lending activities in the GMS. Other forms of support to facilitate the development of RPT have included the establishment of an RPT Coordination Committee (RPTCC) with regular meetings and attendant Working Groups (Focal and Planning). The RPTCC is now in process of discussions to establish a Regional Power Coordination Centre (RPCC) in one of the GMS countries. The establishment of an RPCC would be an important step in the long process to achieve a regional power market in the GMS and the Association of Southeast Asian Nations (ASEAN).

2.1 Sida Support for the GMS RPT

Sida is the sole donor to the Regional Technical Assistance (RETA) 6440 and from 2007 – 2012 has supported it with a grant of USD 5 million, although the actual implementation time for major project activities with a consultant team on the ground was only two years: November 2008 with the first kick-off meeting to October 2010 and the final presentation of RETA 6440 results and recommendations. Activities with remaining funds in 2011 and 2012 have, as main activities, included the financing of a consultant to follow up the establishment of the RPCC, and two studies on planned regional transmission lines (wheeling charges for the Nabong-Udon Thani between Laos and Thailand and an upgrade to a full EIA for the Ban Hatxan-Pleiku between Laos and Vietnam).

RETA 6440 has two main components: Component One was to facilitate the further development of RPT through a series of studies that are in line with the milestones contained in the RPT Road Map, and Component Two focuses on environmental issues with studies done on the "state of the art" in the GMS on, among others, Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA). Capacity building was also provided. The RETA also included provision for a separate "Package III" to conduct interconnection feasibility studies.

Sida has commissioned a review of its support to RETA 6440, but which focuses in equal measure on the actual RPT processes to date. The actual achievements of RETA 6440 and of the RPT process are to be seen also for the lessons they generate in terms of similar processes that Sida may support

[1]The term "GMS" denotes its member countries Cambodia, Laos, Myanmar, Thailand and Vietnam plus two southern States of China: Yunnan and Guangxi.

elsewhere. Whether, and how, RETA 6440 will be followed with further Sida funding for the RPT process in the future remains an open question, and is partly dependent on the findings of this review mission.

2.2 Review Mission TOR2 and Methodology

The overall objectives of the review as provided in the TOR are threefold:

1. To review and assess the progress of the RPT process so far in relation to the IGA, MoU-1 and 2[3], Development Matrix and Road Map;
2. To briefly review and assess the Outputs and Outcomes of the RETA 6440 against the targets set in the Design and Monitoring Framework;
3. To give recommendations on the way forward for the process, with sustainability in focus (Institutional, Financial, Environmental and Social).

The specific issues to be addressed within the review include the following:

- The overall relevance of the Development Matrix;
- The relevance of the RETA 6440, and of its recommendations;
- The achievement of the two MOUs against set targets;
- The integration of poverty, social and gender, plus environmental issues in RPT processes to date;
- Stakeholder contributions to a successful process in future;
- Commitment and ownership of GMS countries in the process;

The Review Mission Team consists of the following three persons:

- *Mr. Juhani Antikainen, Team Leader:* Power system specialist involved with international power and interconnection projects for more than 30 years. His experience includes numerous transmission and distribution projects in Africa, Middle East and Asia.
- *Dr. Rita Gebert, Co-Team Leader:* Specialist on governance and socio-economic issues with over 22 years of project and evaluation experience. She has worked extensively in the countries of the Mekong region and has professional experience in all of the GMS countries.
- *Mr. Ulf Møller, Power Trade Expert:* He has broad experience from the Nordic and European energy markets. He also has extensive experience in power development and trade issues in many non-European countries.

The review methodology started with the preliminary study of available documents, telephonic briefing with Mr. Göran Haag, drafting the Inception Report, and having briefing meetings with ADB in Manila. The Inception Report was finalised in Manila. The review team also had to spend much time throughout the mission to contact different stakeholders for meetings. This required e-mails and follow-up by phone in many instances.

Given the large volume of documents that had been produced under the RETA 6440, not to mention other sources, the Team had to continue to spend time trying to read and digest these documents in order to understand the process of establishing of regional power trade in a context of extreme complexity and fluidity. The team has emphasised qualitative discussion processes with a variety of stakeholders in the GMS countries.

[2]TOR = Terms of Reference. They are attached at Annex One.

[3]MoU-1:"Guidelines for the implementation of the regional power trade operating agreement (RPTOA)– Stage 1," 5 July, 05
MoU-2: "Road Map for implementing the Greater Mekong Sub-Region cross border power trading", 31 March, 2008.

These have included the following:

- GMS member country Ministries responsible for the energy sector;
- GMS National Secretariat representatives;
- GMS member country utility representatives;
- Electricity/energy regulators;
- International and national Non-Governmental Organisation (NGO) representatives working on environment and/or the energy sector;
- Independent Power Producers (IPPs);
- International Financing Institute (IFI) representatives;

In spite of the difficulties in contacting the different stakeholders and short time available, the Team managed to cover the majority of the stakeholders quite well. Meetings with international and local NGOs gave valuable information on the integration of poverty alleviation, social, environmental and gender issues in the RPT process.
The Team was fortunate to have the chance to attend the RPTCC meeting in Ho Chi Minh City on 9 – 10 November and was able to present its findings and elicit useful feedback from the many participants there.[4]

3. OVERVIEW OF GMS REGIONAL POWER TRADE

This chapter provides a brief overview of regional power trade in the GMS, including its general relevance, its instruments and institutions and what progress has been observed to have been made to date.

3.1 Power Systems in GMS Countries

The GMS countries differ from each other greatly when it comes to the size of the economy, i.e. load demand, and in their potential for domestic power generation. China (Yunnan and Guangxi), Thailand and Vietnam have the largest power demands, whereas Myanmar is roughly 1/10 of the demand of a large country and Laos and Cambodia less than half and less than one third of Myanmar respectively. RETA 6440 gives the following load projections for the GMS region:

[4] List of Persons Met, the Mission Schedule and a List of Documents consulted are to be found in Annexes 2,3 and 4.

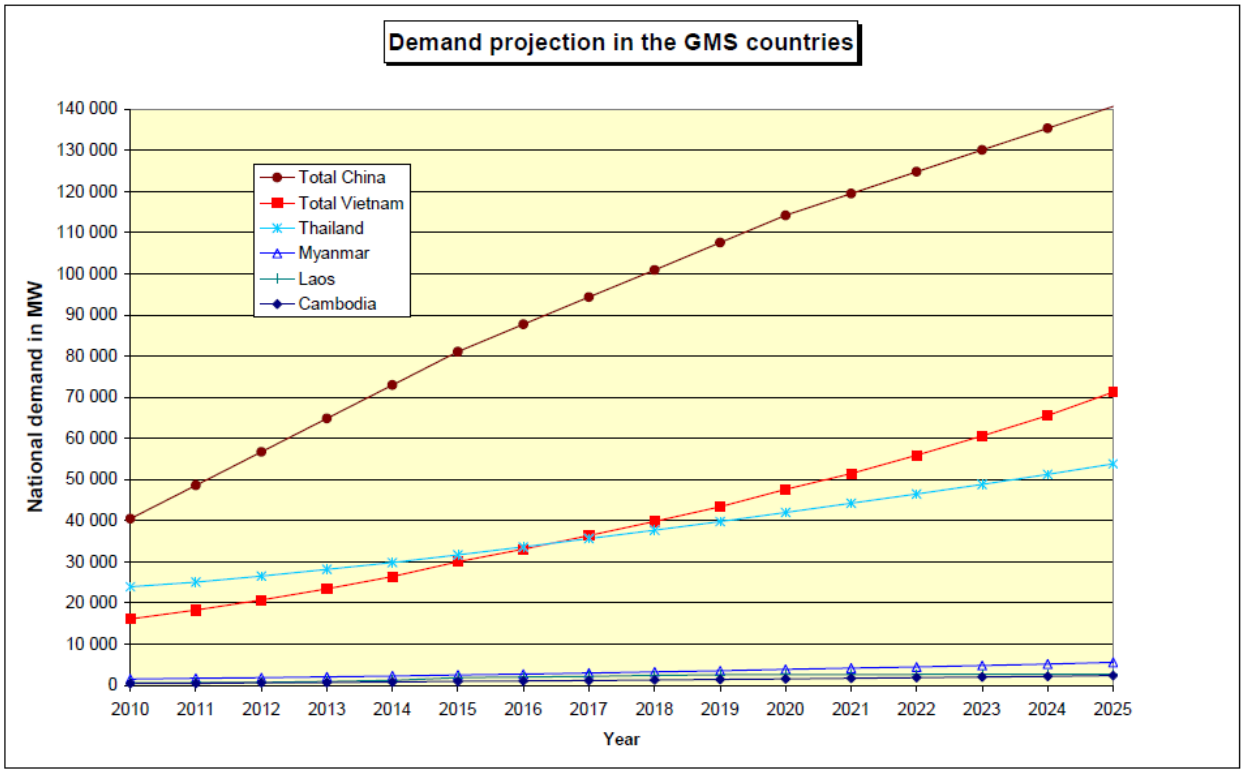


Figure One: Estimated Power Demand in GMS Countries (RETA 6440)

Because of the large power demand, it is expected that China, Thailand and Laos will be power importers in the future. Their total demand is estimated at 96% of the whole GMS area in 2025.

The potential exporters are Myanmar, Laos and Cambodia. The estimated hydro potential that could be available for export is in the order of 44 GW, from which 28 GW in Myanmar, 14 GW in Laos and 2 GW in Cambodia.

Typical organisational set-up is a vertically integrated power utility (or Ministry in case of Myanmar), owned by the government. Unbundling, i.e. separating generation, transmission and distribution functions, has partially taken place in China and is under development in Vietnam.

3.2 General Relevance of GMS RPT

There is undoubted high overall relevance of GMS RPT — the experiences of other regional power markets and pools show that potential benefits are there — but the tremendous differences among the six GMS countries mean that the relevance becomes relativised. That is, when we see the huge differences in the levels of development, including the relative development of their respective energy sectors and demand for energy within the countries, the overall regional relevance has become less clear when compared to the relevance for the individual countries.[5] As the regional relevance in terms of overall cost-benefit analysis has not been well-established to date,[6] for most of the member countries there is far greater clarity of benefit in import or export regimes that occur on a bilateral basis. This even extends to a country like Laos that could benefit greatly from a liberalised regional

[5] This observation was made by a large number of persons who met with the team.

[6] In fact, this was meant to be shown clearly by one of the studies conducted under RETA 6440. The report remains, however, on such an abstract level that it is hard to discern what the real benefits would be. See further discussion below.

power market. It now acts as a power supplier mainly to Thailand in the form of bilateral, IPP-dominated transactions based on long-term PPAs that do not necessarily accord adequate benefit to the Lao.

The Review Team was informed by several sources that the RPT concept is supposed to be "based on hydropower." This would, indeed, have high relevance for the GMS in terms of reducing overall power generation costs and potentially avoiding greenhouse gas (GHG) emission (through the exchange of power from hydropower sources thus at least theoretically reducing the demand for some additional generation capacity from fossil fuels). Of course, while GHG emission reduction is for the common good, the reduction of economic costs for an importing country will only bring benefits to the exporting country if electricity prices are appropriately fixed to share the benefits. Moreover, other social and environmental costs also need to be factored into assessing the overall costs of hydropower.

Given the existing differences between the large, developed countries with their huge energy demands and the economically small, developing countries with their big potentials for hydropower production (Myanmar and Laos and to a lesser extent Cambodia), it is difficult to see how an equitable regional power market could be developed in anything but the long term.[7] This is partly due to the vastly changed investment situation in the region (see section on stakeholders below) by which the wealthier energy importing countries are also becoming the largest energy sector investors in the poorer producing countries. This factor combined with ongoing, subsidised power tariffs in the region is resulting in an unlevel playing field that prevents all GMS member countries from enjoying benefits equitably.

The current situation shows that the large, energy import countries are in a position to have a strong influence on the terms and conditions compared to the small(er) export countries (Laos, Cambodia and Myanmar). This represents a typical value chain whereby the producer ends up getting a low price even for a valuable product due to weak influence on the terms of trade. In this situation, Laos and Myanmar, less so Cambodia, with large, commercially viable hydropower potentials, stand to lose out on potentially huge benefits in the long term.

3.3 Instruments and Institutions

Over the years since the first agreement on the need to establish regional power trade at the GMS 1995 Electric Power Forum, the signing of the GMS Policy Statement on Energy in 1999 (endorsed 2000), and the ministerial IGA of 2002, the GMS member countries have been pursuing increased cross-border energy sales with each other on a bilateral basis. This pursuit has occurred without a coordinating regional institution to date, although two instruments guiding the process of establishing a regional power market are present: the MoUs signed in 2005 and 2008.

The development of the RPT process has been commonly described with Stages 0-3:

- Stage 0: Preparatory phase when the physical interconnections and other requirements for bilateral power trade are not yet in place;
- Stage 1: Country-to-country power transactions are possible on a limited scale;

[7] The economic differences between the GMS countries in terms of GDP are extreme. IMF data for 2010 show that China's economy is 18 times bigger than Thailand's (although Guangxi and Yunnan Province's combined GDP is about two-thirds that of Thailand's). In turn, Thailand's GDP is almost double that of the other four GMS countries put together!

- Stage 2: Trading will be possible between any pair of GMS countries, using transmission facilities of a third regional country;
- Stage 3: Full competitive regional power market.

The next step, presently under discussion but already agreed to in principle, is to establish a Regional Power Coordination Centre (RPCC). Whether this will be adequate to further the overall process of an equitable regional power market remains to be seen.

As is shown below, much of the energy sales that occur to date cannot be characterised as "trade" as such, as they most often occur in a context of "point-to-point" energy sales from an IPP to a utility with a dedicated transmission line for that Power Purchase Agreement (PPA). As far as the Team could determine, such arrangements do not allow third party access even when the transmission line may have excess capacity that allows for it technically.

3.3.1 IGA, RPTOA, MoUs and Road Map

The IGA signed in November 2002 was to implement the Policy Statement on Regional Power Trade endorsed in 2000, and to establish a framework for the advancement of regional power trade in the GMS. The first MoU was signed in July 2005 with a purpose to set the guidelines for power trade to achieve the so-called Stage One of regional power trade.

The IGA, under Article Two, defines the objectives of regional power trade as follows:

i) coordinate and cooperate in the planning and operation of their systems to minimise costs while maintaining satisfactory reliability; and
ii) fully recover their costs and share equitably in the resulting benefits, including reductions in required generation and transmission capacity, reductions in fuel costs and improved use of low-cost electricity sources; and
iii) provide reliable and economic electric service to the customers of each Party.

The IGA includes three important principles: Cooperation (the Parties "have equal rights and obligations, act in solidarity, and refrain from taking advantage of one another."); Gradualism (Parties consider the progressive development of RPT); Environmentally Sustainable Development (RPT operates within a framework of respect for environment).

For the purposes of establishing RPT, the principle of gradualism has been chosen. While this principle gives intrinsic recognition that a longer time frame would be required to establish regional electricity trade, subsequent instruments have not defined the time frame adequately, nor set concrete milestones to achieve certain, defined stages. This is despite the Road Map developed under MoU– 2. MoU – 1 sets out the institutional arrangements for RPT. It also sets out the guidelines and conditions that the transmission system operators (TSOs)[8] in the GMS member countries have to follow to conduct cross border trade bilaterally. By definition, Stage One is considered to be the period when only country-to-country power transactions, such as PPAs between parties or IPPs selling to a utility, are possible before a regional transmission network is established. It also says that cross border trading refers to "opportunity exchange of power between National Power Utilities of the parties using excess capacity of existing cross border transmission lines over and above the transmission capacity required for power transfers associated with PPAs."

[8] The six TSOs have been identified as follows: CSG: China Southern Power Grid, EDC: Electricité du Cambodge, EDL: Electricité du Lao, EGAT: Electricity Generation Authority of Thailand, EVN: Electricity of Vietnam, MEPE: Myanmar Electric Power Enterprise.

The guidelines under MoU – 1 include the following (not exhaustive) and would constitute, in essence, a Regional Power Operating Agreement (RPTOA):

- Communications and General Aspects of Transactions;
- Interconnection Control;
- Operational Coordination of Cross Border Interconnections;
- Cross Border Load Flow Scheduling;
- Metering and Billing Transactions;
- Penalties for Non-Compliance.

By 2008 it was realised that the GMS countries were not getting any closer to achieving Stage One of RPT, at least partly because the MoU – 1 had been drafted without the inclusion of timelines. Thus, in recognition that there were no timelines for to achieve Stage One, the MoU – 2 was drafted, agreed upon and signed in 2008. Its main purpose was to specify timelines — a so-called Road Map — "to fully achieve Stage One." Under Articles 3 and 4, the Road Map is defined in seven studies and an "Indicative Power Interconnection Master Plan" that should include "priority new interconnection projects for undertaking feasibility studies by 2009."

After completion of the seven studies plus Master Plan, this would then lead to "preparation for Stage Two." Stage Two in the process of achieving a regional power market is defined under MoU – 2 as "the moment when trading will be possible between any pair of GMS countries, eventually using transmission facilities of a third regional country. However, in this stage the available cross border transmission capacity is limited and based on surplus capacity of lines linked to PPAs."

It is laudable that the MoU – 2 defined necessary studies and the timeframe in which to complete them (with the exception of one, all by 2012). Nonetheless, the completion of a set of studies does not actually mean that Stage One has been reached. In fact, the Review Team suggests that the implementation of the two MoUs to date has not led to the GMS countries moving beyond what has been called "Stage 0."[9]
The RETA 6440 consultant team had prepared an updated Road Map that was presented at the RPTCC in October 2010. The consultants have done a good job to update the Road Map, although the final product still places much emphasis on studies rather than the concrete actions that need to be taken that will further a process of regional power market development. Nonetheless, associated with "Milestone Six" in particular, there is a list of crucial actions identified as "prerequisites for the GMS market."[10] (See Chapter 4.6.1).

3.3.2 RPTCC and Working Groups

The RPTCC was established as a result of the 2002 IGA in 2004. From July 2004 until November 2011 there have been 11 RPTCC meetings held in different cities of the GMS. This means an average of one to two meetings per year over the past seven years.

[9] "Stage 0" is set of activities for "Preparation for RPT," and is taken from the following ADB Technical Assistance Document dated14 October 2007: Technical Assistance for Facilitating Regional Power Trading and Environmentally Sustainable Development of Electricity Infrastructure in the Greater Mekong Subregion

[10] This new Milestone reads, "Implement the proposed recommendations of Step 1 [The Team is not sure what this Step 1 is exactly] related to the implementation of the Conceptual Design of the GMS Electricity Market."

In addition to the RPTCC, a Focal Group and Planning Working Group have also been established, both in 2006. Although they are both defined under MoU – 1, their actual roles and responsibilities do not appear to be that clear. Of the two sub-groups, it appears that the Focal Group was considered the real "working group" in that its members were supposed to "implement the decisions of the RPTCC on a day-to-day basis in their respective countries and to act as the coordinating body of the RPTCC work programme in each GMS member country." It was left open for the RPTCC to decide if the Focal Group could "evolve into a Technical Secretariat." The meetings of these two groups have more or less always coincided with those of the RPTCC, but it is also not clear as to what kind of activities have taken place in the respective countries between the meetings, and the three bodies have more or less blurred into one over time.

From the various discussions that the Review Team could hold in four different GMS Member countries, it appears that the conclusion to date is that the RPTCC meetings have proven useful for networking and exchange of updated information as to energy plans. On the other hand, however, they are not seen as a particularly useful tool for facilitation of regional power trade since there were not so many concrete actions that arose from the meetings. Several persons observed that the attendees of the meetings changed quite a bit from meeting to meeting, meaning that there was inadequate continuity and depth of discussions. It was noted that some meetings were like "starting over again," as various issues known to some participants would have to be explained to newcomers.

All in all, the RPTCC and its constituent working groups represented a good way to start a process of regular discussion on the needs, general benefits and requirements of RPT. This has also served the purpose of both awareness creation and trust and confidence building among the participants on the good intentions of all GMS countries to cooperate more closely on energy-related issues. Despite this, however, the level of ownership and commitment among the GMS countries for these institutions remained relatively stagnant. Thus, it was recognised by the 9th RPTCC meeting that there is a strong need for a permanent secretariat to facilitate regional power trade on a daily basis.

Finally, although Sida's support for the facilitation of RPT included a component on "facilitating environmentally sustainable development of electricity infrastructure in the GMS," it is noticeable that representatives from GMS ministries of environment have not attended the RPTCC meetings. Members of civil society, such as national and international NGOs, have also not been requested to make any presentations at these meetings (this is the practice of the GMS cooperation as a whole).[11] Overall, none of the instruments on RPT provide guidance or give weight to environmental or socio-economic sustainability of either the energy sector in general or regional power trade in particular. The only exception to this is the principle of "respect for environment" mentioned under the IGA.

3.4 Progress of the RPT to Date

The first issue that arises in analysing the general progress in establishing the RPT is that none of the instruments have adequately defined a time frame for the establishment of a regional power market. This is partly to do with the underlying principle of "gradualism". The Road Map focuses mostly on studies that should be carried out, but shies away from concrete milestones against which the RPTCC members could measure real progress on the ground. Although the Road Map says that many studies and a Master Plan should have been completed by 2012, the concrete actions including, importantly,

[11] Representatives of the Mekong River Commission (MRC) and from the ADB-supported GMS Environment Operations Centre (EOC) have, however, been attending regularly.

the level of investments that would be required to start along the road to RPT were not clearly defined and documented.

The Team finds that while the concept of RPT has relevance in terms of potential economies of scale and relieving some demand for fossil fuels (through replacement by hydropower that is either imported or seasonally exchanged, for example), there are a large number of factors at play in the GMS which represent major challenges to the establishment of a regional power market. Some of the challenges, as will be argued below, are not external to the purview of technical assistance, but they need to be appropriately targeted. When the main challenges lie nationally — such as when power grids are absent or virtually absent or legal and regulatory frameworks are still in an absent or nascent stage — it may be necessary to focus assistance on a limited part of the GMS first rather than trying to conduct activities regionally. This is not acknowledged in the Road Map or other instruments.

In the final analysis, despite many good intentions and some clear advances in regional networking on energy-related issues, a regional power market is not really closer to being achieved now than it was when the IGA was signed in 2002. Indeed, there is a political-economic dynamism in the region that may potentially make socio-economically and environmentally sustainable regional power trading even more difficult to achieve than when it was first conceptualised in the GMS in the 1990s (more discussed under chapter 5: Challenges in Establishing a GMS Regional Power Market). Moreover, not all the GMS countries, including their national utilities, have the same level of commitments, or the same perception of potential gains from the establishment of a regional power market. Certainly, not all the countries would stand to benefit to the same degree from the implementation of a regional power market.

Slow progress in establishing a regional power market is not unusual; one need only look at the long years involved in establishing the Nordic Power Pool or the Southern Africa Power Pool (SAPP). At the same time, however, there needs to be a clear understanding of all the preconditions and factors — general policy, technical cooperation, infrastructure and interconnections, regulation and harmonised regulation to a certain extent, pricing etc., as a start — that need to be present if a regional power market will be able to function. This does not seem to be present to an adequate degree in the GMS, meaning that facilitation processes as embodied in the RETAs have been remiss in design and consequent implementation.[12]

The discussion below on the key observations and analysis of the RETA 6440 plus the supporting and hindering factors on establishing regional power trade will provide more insights as to the realities of the overall context of the energy sector in the GMS.

3.5 Overview of Stakeholders in the GMS Energy Sector and RPT

The governments of the GMS are clearly the most important stakeholders in the RPT, as it is their overall energy policies and agreements both domestically and regionally that determine whether a regional power market will be achieved. Of course, governments are also not monolithic entities and there are different ministries and utilities that are involved in the "energy mix." These include ministries of energy or industry, national utilities, subsidiaries of national utilities and, importantly, national regulators. National regulators are relatively new in the GMS, and those which have been established are not more than ten years old. China's regulator, SERC, was established around 2002 and

[12] This situation is not to blame the RETA 6440 consultant team who seemed to have been trying diligently to fulfill their TOR.

Cambodia's EAC in 2001. Vietnam's ERAV was set up in 2005 and Thailand's ERC only in 2008. Laos and Myanmar do not have separate regulators at all.[13] The development partners such as WB, ADB, Sida, AFD and others are not mentioned here as stakeholders, although they naturally play a crucial role in the development of the RPT and the energy sector as a whole.

From the time that RPT was conceptualised until today, however, the private stakeholder context in the energy sector has seen a massive change in the number of players. The biggest change to be observed in the region has to do with the boom in private sector actors such as construction companies, hydropower developers and private banks. In all cases, although the majority of these actors are from Asia — both within and outside of the GMS — there are a number of players from outside the region as well.

Since China began its policy of "going out" or "going global strategy" around 2003, Chinese banks and State-Owned Enterprises (SOEs) have begun to make huge investments in energy sector projects, whether thermal or hydropower all around the world, including the GMS. The largest Chinese bank involved is China Exim, which provides loans to Chinese SOEs for their investments in power projects. Chinese companies are investing in many energy-related projects in Cambodia, Myanmar and Laos. All of these projects are being established on a Build – Operate – Transfer (BOT) model that may last anywhere from 25 years to 40 years from Commercial Operation Date (COD), although 25 to 27 years appears to be the norm.[14] The resulting Independent Power Producers (IPPs) are most often the product of joint ventures between different private companies and sometimes of government. The IPPs operate the power plants according to the terms of the PPAs and Concession Agreements (CAs).

The Chinese SOEs are following government policy on "going out," and thus it appears that they also may be getting favourable loan conditions from the China Exim bank for their overseas investments that could affect competition in the market. Some of the larger Chinese investors in the GMS region's energy sector are Sinohydro, Datang, CWE, and China Southern Power Grid International (CSGI).

Large Thai companies are also involved in the energy sector, and have investment interests in Laos. Thai companies include EGCO and Ratchaburi (both spinoffs from EGAT in which EGAT maintains significant shareholdings), Ch. Kanchang and Ital-Thai. Vietnamese SOEs, Korean, Malaysian and Russian companies are also now involved in energy sector investments. Virtually all of the companies mentioned invest in generation projects, not in transmission or distribution projects. Thus, countries like Laos, Cambodia and Myanmar that do not have national grids are seeing power projects getting constructed that then have dedicated transmission lines to the neighbouring, purchasing countries. Thus, installed and potential power capacity in these countries is getting "locked into" long term PPAs that do not allow for regional power trading.

Aside from China Exim other international private banks, including from Europe, Thailand, Vietnam and India have also become financiers in various power generation projects. In this regard, the relative importance of the international financial institutions (IFIs) such as the World Bank Group and the ADB has reduced in the past seven years or so since China has started its "going out" policy mentioned above. This may require repositioning of the IFIs in the stakeholder landscape.

[13] EAC = Energy Authority of Cambodia, ERAV = Electricity Regulatory Authority of Vietnam, ERC = Energy Regulatory Commission, SERC = State Electricity Regulatory Commission,

[14] The Theun Hinboun project in Laos run by the Theun Hinboun Power Company (THPC) has a current PPA that will expire in 2023, but with the construction of the Theun Hinboun expansion, this PPA will be extended by another 25 years from the new project's COD. About 88% of the electricity generated under Theun Hinboun will be exported to Thailand.
The PPA with Sinohydro for the Kamchay Dam in Cambodia is 40 years from COD.

While the participation of the private sector should, of course, be welcomed in the energy sector, it also comes fraught with challenges. These challenges relate in part to the lack of adequate regulatory and pricing arrangements in the region, as a hinder for a fair benefit sharing between the countries. They also relate to a lack of transparency in the negotiations that lead to Concession Agreements (CAs) and to PPAs. Another issue that has arisen in Laos, for example, is the government's attempts to deal with each power investment project on a case-by-case basis. This has implications not only for the PPA arrangements reached, but also for environmental impacts as different IPPs are ending up, or will end up, on the same Mekong tributaries. This, in turn, means uncoordinated construction and operation of dams and power plants with a higher potential for environmental damage, particularly in more sensitive eco-systems.

It may also be observed that the lines are often blurred in terms of what kind of roles the different stakeholders are actually playing in the energy sector. For example, Thailand's EGAT is a powerful single buyer that is enabled to extend its grid into neighbouring Laos through its "daughter" investors (EGCO and Ratchaburi) which are part of IPP consortiums financed by Thai banks. As Professor Jarvis of the National University Singapore reported, "there is an informal agreement between . . . the . . companies [EGAT, EGCO, Ratchaburi] not to directly compete for the acquisition of assets that even extends to setting out the prospective spheres of influence for investment in neighbouring countries."[15]

While such arrangements among large private sector actors may not have major consequences in a context of strong resource and energy governance and clear and implemented regulatory frameworks, the context of the GMS does not provide these features with consistency. Of course, there is always the possibility of self-regulation of financiers and investors if they adhere to, in the case of banks the Equator Principles for example, or to a transparent set of socio-economic and environmental safeguards as put forward by the IFIs. The record in the region in this regard is uneven.[16]

RETA 6440 has also provided more room to include ministries of environment in issues related to regional power trade, but it appears that they continue to remain on the sidelines of the energy sector. This is evidenced by the various hydropower projects, including transmission lines, that are planned or under construction in ecologically sensitive areas such as national parks, national conservation areas or national protected areas.

4. KEY OBSERVATIONS AND ANALYSIS OF RETA 6440

This chapter studies the relationship between the objectives and the results of the RETA 6440 in terms of facilitating the progress of the RPT. How relevant has the RETA been to further a regional power market? Should it have been designed differently? Or was the design correct but the implementation poor? How useful have the studies been, and has the inclusion of a component on environmental aspects been successful in giving higher priority to such aspects in the planning of RPT?

[15] Darryl S. L. Jarvis (2009), "Risk, Regulation and Governance: Institutional Processes and Political Risk in the Thai Energy Sector."

[16] The Nam Theun 2 hydropower project financed by, among others the World Bank and ADB, sets high standards in its 1600 page Concession Agreement for social and environmental safeguards and livelihood support. These standards, however, have been largely rejected by the Lao government as too bothersome and time consuming.

It may be observed at the outset that because of various delays the RETA 6440 had a curtailed time frame. It had been planned to implement the project from 2007 until 2010. In actual fact, it only started at the end of 2008 and the consultant team basically had ended its work by the end of 2010. When one sees the huge volume of reports and studies, not to mention various workshops, it becomes obvious that such a volume could not be absorbed by the clients in such a time frame. In fact, there was no time given for "digestion" and reflection on concrete further steps that may have become more obvious as the result of a study having been conducted on a particular topic.

4.1 RETA Design in Relation to RPT Development

4.1.1 Objectives, Components and Modules

RETA 6440 had two components: "Facilitation of development of the RPT," and "Capacity development for environmental impact assessment of power projects." The many objectives of the RETA (11 totally) show that the expectations put on the consultant team were very high, indeed. In fact, the RETA design seems to have suffered from several major problems: first, that it was too overloaded with objectives and topics not all of equal relevance for the stage of progress of the RPT. Although it is stated that the Component One objectives "correspond to the milestones of the Road Map in MoU – 2," it does not mean that all of them were of equal priority; second, that it lacked both capacity development and "ownership creation mechanisms" related to the project's results; third, that its two components were not adequately integrated – not even the components itself.

The objectives (seven of them) of Component One relate to the following topics:

- Finalising the GMS Power Interconnection Master Plan (with regional priority projects identified);
- Benefit sharing mechanism demonstrated;
- Feasibility studies on priority transmission interconnections (Package III);
- Regional power sector database;
- Requirements for institutional, legal, commercial technical framework for RPT;
- Road Map updated;
- Training and capacity building.

As many of these objectives correspond to the production of studies as shown under the Road Map, these are dealt with in the section on studies below. Package III was never completed.

Regarding Component Two, there are four objectives that all have to do with environmental aspects of power planning and (eventual) trade:

- Capacity assessment on environmental Planning;
- Planning and management training;
- Capacity building on Environment Management Plan practices;
- Capacity building on SEA, CIA and EMP through case studies and on-the-job activities.

The objectives of RETA 6440 are not particularly well-formulated and read like major activities or outputs rather than objectives. It would have been better if the ADB, Sida and the GMS country power sector representatives had held a joint planning workshop that resulted in an appropriate logical framework with goal, purpose, immediate objectives, major activities and objectively verifiable

indicators with timelines. Such a process would also have increased the chances of member country ownership of the project and its results as they would have had more inputs into the formulation of both the RETA and the consultant team's Terms of Reference. The Review Team recognises that such a participatory process of project formulation might have cost more in terms of time; nonetheless, the results would have likely justified the cost.

Several implementation issues arose under the RETA. One is that it suffered from delayed implementation (owing primarily to procedural delays) and only really started in late 2008. Another is that the Sida secondee, Ms. Annelie Gabrielson, at ADB was only able to facilitate the RETA 6440 process for just over a year. One more issue was that with the larger number of consultants on board, it appears that not only did the two components not inform each other; the studies done under the four modules of Component One also did not inform each other adequately. Thus, the overall outcome of the RETA would have benefited from more internal consistency and coherence; highly desirable, and necessary, for such a complex sector. The result is a project that has produced many studies and reports according to the TOR, and conducted a number of worthwhile workshops but which have not had a major impact on the progress of the RPT (see further discussion below).

4.1.2 Development Matrix

A Development Matrix for RPT was prepared in 2006-2007 by ADB, in consultation with GMS countries and development partners including the World Bank, AFD and Sida. The development matrix envisages stages from preparatory stage through expansion of cross border bilateral cooperation to advanced multiparty exchange and finally to full market integration stage. The Development Matrix was prepared before the Road Map of MoU-2, which is a simplified version of the Development Matrix and indicates also some timelines for the planned activities. From our point of view, it seems that the Development Matrix was an important input to the ToR of RETA 6440.

4.2 The RETA Studies

At the core of RETA 6440 lie the numerous studies that the consultant team completed. These studies were done in accordance with those studies enumerated in the Road Map as necessary preparatory work to achieve Stage One.

4.2.1 Studies Completed Under Component One

<u>Component 1, Module 1</u>
Update of the GMS Regional Master Plan

The report of Module 1 consists of the Main Report (136 pages), Appendices and Executive Summary (83 pages). The first observation is that the Executive Summary is by far too long, and the main results and recommendations are not clearly spelled out.

The previous studies for the same subject were the Indicative Power Master Plan by Norconsult in 2002 and Update of the Regional Master Plan by Soluziona Mercados in 2008.

A typical problem in preparing or updating the regional master plan is the collection and verification of data. In case of RETA 6440 this apparently caused some serious delays in the early phases of the project. The power development plans are at different stages in each country, and decisions have to be made on the input data to be used for the regional analysis. In practice the results of the regional study

are already outdated when the study is completed. The updating of the data and reviewing regional development should be a continuous process.

The main benefit of the Master Plan is the overall picture of power development in the area, with the current demand estimates and production plans. The assumptions for average generation cost for each country allow for the estimation of potential cross border transfers. However, each and every project would require a complete analysis on technical and economic feasibility, including environmental and social impacts and their mitigation measures. One of the key elements that were proposed was the two East-West routes linking Thailand, North Laos and Vietnam in the north and Thailand, South Laos, Cambodia and Central & South Vietnam in the south.

Component 1, Module 2
Benefit Assessment of Power Interconnections in the GMS:

The consultant has presented international examples of regional interconnections and the sharing of benefits. These examples are from the European competitive market situation, and thus do not provide practical guidelines for GMS country representatives. Furthermore, the objective was to demonstrate a mechanism for benefit sharing between countries arising from the benefits of the priority interconnection projects, so the calculations showing benefits from all potential interconnections do not provide practical guidelines. The real benefits that may accrue via power trade to the poorer exporting countries have not been made clear enough.

Component 1, Module 3

1. Assessment of Candidate Transmission Projects
2. Assessment of Potential for Synchronous Operation
3. HVDC vs. AC Interconnection
4. GMS Reference Documents on Performance Standards
5. Metering Arrangements

Module 3 is looking at the existing transmission networks in detail and providing preliminary designs for the potential interconnections. According to the judgement of the Review Team, the collected information appears too detailed in relation to the needs of the Master Plan itself, but provides a good database for future more detailed transmission studies. The second study of Module 3 looks at the possibility for synchronous operation of the regional grid. The conclusion seems to be positive, but in practice more detailed studies, including stability analysis, would be needed in case of any individual interconnection project. The third study provides general information on HVDC technology and the last study, and the fourth study is looking at the performance standards in the wholly integrated regional network. The last study gives recommendations on metering.

Component 1, Module 4

1. Review of GMS Regulatory Framework
2. Review of International Experiences
3. Conceptual Design of the GMS Power Market
4. Implementation of the Conceptual Design for the GMS Market

The first study provides a review of the existing regulatory framework in each country. The following studies present first the experiences from power market liberalization from various parts of the world, and then provide plans how similar approaches could be carried out in the GMS.

The main emphasis of Module 4 is the "final" GMS power market situation, which is in today's situation very far in the future. Therefore the Team has the opinion that the studies should have concentrated more on actions needed to be taken in each country to serve the near future, in order to increase the ownership of the stakeholders to the process. Nonetheless, the studies completed under Module 4 are of critical importance and seems not to have been given the due attention they deserve. They touch on crucial requirements if a regional power market is to be achieved at all.

Based on these studies, and the Review Team's knowledge of the Nordic and European experiences, a summary chart was prepared as follows:

Prerequisite	Main Action	Region		
		Nordic	European	GMS
Political Cooperation	Making the way forward, harmonizing the legislation	The Nordic Council; Common NPS spot market in 1998	The Commission; Internal Market Directives (1-3 energy package)	GMS/RPTCC meetings; but so far no harmonizing
Existence of regulators	Market rules & regulations	YES	YES	In 4 of 6 countries
Cooperation of Regulators	Harmonizing regulations, market rules etc	NordREG (Nordic regulators)	ACER (ERGEG)	Not existing
National Grids (independent TSOs)	Responsible for power flow	YES	YES (more or less)	In 3 of 6 countries (not independent)
Interconnection between markets	Possibility for import/export	YES	YES	Partly existing
Cooperation of independent TSOs	Grid codes, balance settlement, etc	Nordel (Now a regional group in ENTSO-E)	ENTSO-E	Not existing

Chart One: Prerequisites for a Common Regional Market: Comparison of Nordic, Other European and GMS Experiences[17]

Component 1, Module 5

Upgrading the Structure of the Existing GMS Regional Database and Website

A power system database has been created in connection with RETA 6304 in 2007. It is currently being maintained by CSG, but according to the interviews has not been in active use (except by RETA 6440 consultants). The Consultant has provided some advice for the development of the system, with a recommendation that the RPCC should take care of it.

[17] Our understanding is that the suggested RPCC will be in line with Nordel and ENTSO-E in this chart; that is an important cooperation – but there is also a need for a higher degree of political involvement and cooperation between regulators to facilitate a regional market

Components 1 and 2:
Update of the RPTCC Road Map for Cross Border Power Trade

The original roadmap of MoU-2 has been compared with the results of RETA 6440, and remaining works highlighted. This report also includes the recommendation to establish a Regional Power Coordination Centre.

4.2.2 Studies Completed Under Component Two

The Review Team will not go into detail on the studies completed under Component Two.[18] The main ones done were:

1. Analysis of SEA in GMS Countries, Identification of Gaps, Needs and Areas for Capacity Development;
2. Analysis of EIA/EMP in GMS Countries, Identification of Gaps, Needs and Areas for Capacity Development;
3. Recommended Environmental Management and Monitoring Plan (EMP) & Social Development Plan (SDP) Annexes to the Concession Agreements of Large Power Development Projects;

The analysis studies of both SEA and EIA show the strengths and weaknesses of the general "study approach" as exemplified by the RETA. The two reports are well-written and extremely thorough, but this makes them rather as lengthy, academic exercises and would it have been better if they were combined into one, much shorter report. It is rather unlikely that the results would be applied by the GMS countries.

The SEA analysis shows that none of the GMS countries "have developed fully functional SEA systems to date" (in fact, as the report points out, only China and Vietnam have them at all as a part of a legislative framework). It also points out that there are "multiple challenges and barriers" to establishing effective SEA frameworks in the countries. Thus, the question becomes not what capacity building is needed, but rather what legislative and regulatory frameworks need to be put in place first. Another question is what other instruments are available—besides SEA—that would ensure the protection of both people's rights and livelihoods and the environment. In terms of EIA, legislative frameworks are in place in all the GMS countries but Myanmar, but ongoing issues relate to poor quality of the reports themselves, lack of implementation of "good" reports' recommendations and too little general monitoring thereof.

The Recommendations report listed above provides standard text to be added to Concession Agreements so that an Environmental Management Plan and a Social Development Plan (social safeguards package) are implemented. This report is of a totally different nature than the other two reports and could be part of individual power development projects. It is not known if these CA annexes have been applied anywhere or not. It is also not known by what mechanism they should be made known to CA negotiators.

4.3 Regional and National Capacity Building

Several of the objectives of the RETA 6440 relate to capacity building. This was largely accomplished in three ways. For the most part, there were workshops held on different topics, such as benefits of

[18] See full list of reports, including relevant workshops, for Component 2 at Annex 6.

interconnections, EIA and SEA, and EMP-SDP. Another important means used for capacity building were study tours: one to the Nam Theun 2 dam site in Laos and another one to the SAPP. It appears that the latter study tour in particular was highly appreciated by all the participants. The consultant team also did on-the-job work together with Cambodian government and utility representatives to create a Power Development Plan (PDP), using OPTIGEN software.

Whether the large workshops using primarily lectures plus some group discussions would count as "capacity building" remains an open question. Persons the Team spoke to who had attended the workshops mentioned appreciation for new learning but none said they were applying what they had learned. Moreover, one participant could not remember what the workshop was about that he had attended.

The use of the phrase "on-the-job" to describe large workshops held in hotels is not well justified. Such events are good for awareness creation and some networking among the participants, but they do not necessarily lead to envisioned "capacity building" and holding group discussions within a workshop does not classify it as "on-the-job."

Given some of the large gaps identified by the RETA team and others when it comes to legislative frameworks and institutional capacities in the GMS, it could have been useful to identify — together with the GMS country representatives — ongoing capacity building programmes with cascade, mentoring and/or training of trainer approaches embedded in an overall host country commitment to institutional development and reform in the identified areas.

In conclusion, although the Review Team appreciates the major efforts that went into conducting the various workshops under the project, and the tremendous amount of information that was imparted during them, there is unlikely to have been much impact arising from them. The RETA 6440 could have been more effective if it had been conceptualised differently in order to emphasise more effective capacity building packages, rather than one-off workshop events.

4.4 Inclusion of Crosscutting Issues

The TOR of the Review Mission requests the Team to look at whether poverty alleviation, social and environmental issues have been integrated in the RPT process and power system development. On the poverty alleviation or social (including gender) issues, they were more or less subsumed under the environment umbrella as would be included under a SEA, for example. On the general GMS level, power sector development and regional power trade are seen in general economic development terms that will "trickle down" to the rural poor. The gamut of potentially negative effects that may arise directly, for example, from hydropower projects in terms of resettlement and/or short and long-term disruption of livelihoods are difficult to address in concrete terms.

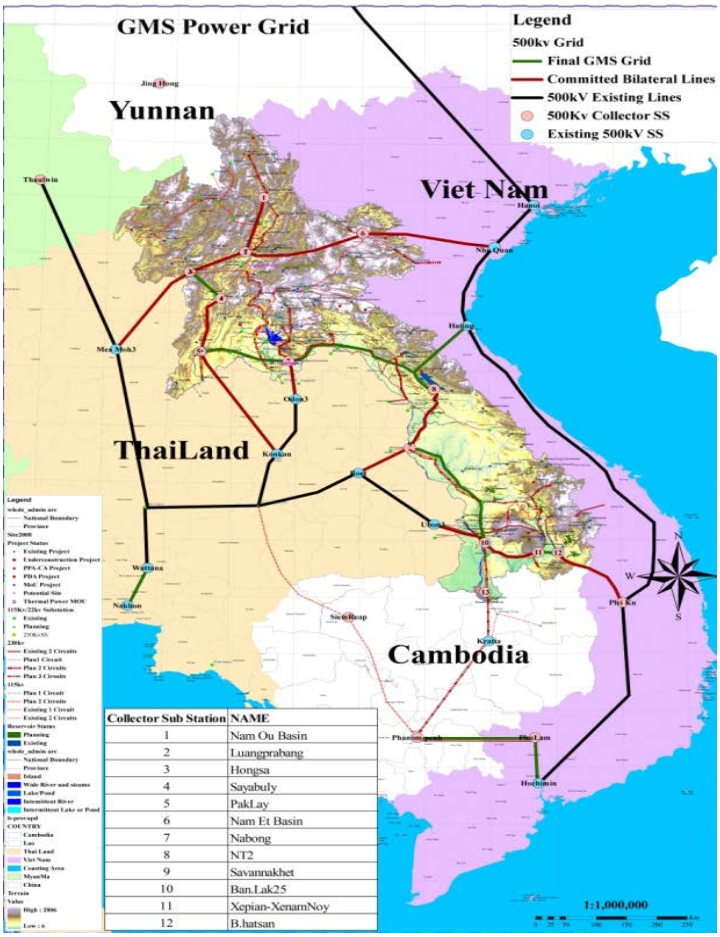
RETA 6440 had a specific mandate to integrate or facilitate mainstreaming of environmental issues into power system development, but according to the judgement of the Review Team, the efforts under the project could only be seen as a small contribution that would need coordination and cooperation with other stakeholders. Again, the huge variations in the region could have been better taken into account in determining what actions, including capacity building measures, could be usefully undertaken.
In this regard, the RETA Team was handcuffed by its TOR, where the original scope was defined. In addition, the company initially foreseen to conduct SEA-related work (Stockholm Environment

Institute) dropped out of the implementation team early on, and their work had to be carried out by others. The RETA Team did cooperate to a certain extent with MRC and with the EOC on environmental issues, but ADB decided that an SEA on the Vietnamese Power Development Master Plan VII should be conducted by EOC. Thus, an envisioned SEA case study was not done under RETA 6440.

In terms of environmental and social issues, the RETA 6440 team would have been more informed if it had consulted with local and international civil society organisations that are working on such issues in the region. While they may represent a more "radical" or "activist" position regarding power, especially hydropower, development it is still useful to be in dialogue with such organisations and the women and men they represent. In fact, the Worldwide Fund for Nature (WWF) has teamed up with the ADB and MRC to come up with a river (sub-) basin hydropower assessment tool called Rapid Basin-wide Hydropower Sustainable Development Tool or RSAT that may be used with more local people's participation.

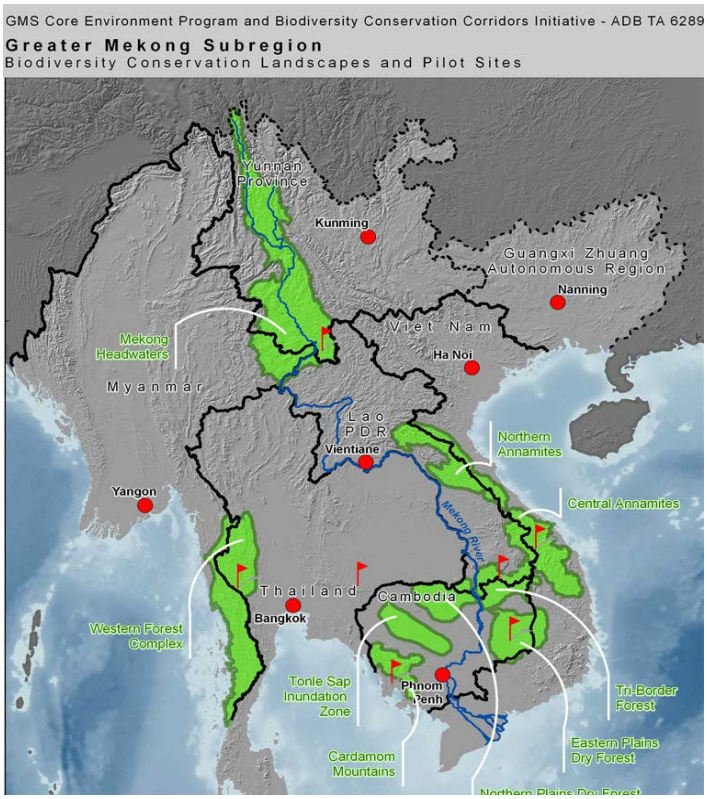
As with other aspects of the RETA 6440, the integration of crosscutting issues has been dogged by the making of a complex subject even more complex, rather than trying to simplify it and bring it down to the most important elements that all stakeholders would need to have a common understanding on. An example of this would be simply to raise attention to the location of national protected areas or biodiversity corridors when planning hydropower projects and transmission lines (See Figure 1 below which shows that power schemes and transmission lines overlap rather too much with biodiversity corridors. See Annex 5 for some further comparative maps).

Figure Two: Transmission Lines and Biodiversity Corridors: Too Much Overlap?



Collector Sub Station	NAME
1	Nam Ou Basin
2	Luangprabang
3	Hongsa
4	Sayabuly
5	PakLay
6	Nam Et Basin
7	Nabong
8	NT2
9	Savannakhet
10	Ban.Lak25
11	Xepian-XenamNoy
12	B.hatsan

Plans for GMS Power Grids (Map from Ministry of Energy, Laos)



Biodiversity Corridors Map from EOC

4.5 Achievement of Stated Objectives (Overall Effectiveness)

The TORs ask to what extent the objectives of RETA 6440 have been achieved. There were obviously too many of them for one project team to implement effectively in a short time. This was made all the more complicated by the number of consultants involved: RTE International, Electricité de France, Power Planning Associates, Nord Pool Consulting, Franklin Law Firm and the Centre for Energy Environment Resources Development (CEERD) have all been involved in different aspects of the RETA's implementation. The work of such a large team could not be adequately coordinated in the short time, and it appears to the Review Team that reports were produced without sufficient reference to one another. Such an issue could have been solved by having a smaller team working for a longer time, and more closely, with the GMS member countries.[19]

An issue mentioned by a number of GMS country representatives is that while the knowledge and expertise of the consultants was appreciated, it was also felt that they did not have adequate grounding in the real situation of the GMS. Thus, much of their knowledge could not be "transferred" and applied. In other words, the RETA served the purpose of introducing new ideas, but without adequate mechanisms to ensure their implementation given the conditions in the region.

The observed (by GMS members) disconnect between the consultants' high level of expertise and their understanding of what is really needed in the region did reduce the overall effectiveness of the RETA. While some of the studies and reports are undoubtedly of high quality, others are of an abstract or theoretical nature so that there is less chance for them to be applied in the region. This tendency toward abstract complexity, as embodied in some of the modelling approaches taken, benefit assessment as one example, has also reduced the potential effectiveness of the project.

4.5.1 Sida's Expectations of the RETA 6440: Fulfilled?

The Review Team has also checked if Sida's expectations of the RETA 6440 have been fulfilled. These expectations were expressed in its Assessment Memo dated October 2007. The following outputs were expected to be achieved from the Swedish contribution:

- An updated Regional Power Master Plan for the period 2008 – 2020, including a road map for regional power integration, adopted by the GMS member countries;
- Regional power system database established;
- Feasibility studies (FS) for two priority regional transmission projects completed;
- Established methodology for evaluation of mutual and national benefit adopted and national experts trained;
- Established GMS Regulatory Forum;
- Enhanced capacity among GMS power utilities and environmental authorities on environmental management in planning, implementation and environmental monitoring of power infrastructure;
- Completed pilot study on SEA and CIA for a selected river basin.

Of these seven outputs, the first output-arguably the most important one-has been accomplished in full. While the updated Regional Master Plan has been achieved using data painstakingly collected by the consultant team, it did not lead to a regional power system database being established in the sense of an active database being used by the GMS countries. The other concrete outputs could not be

[19] This was a strong suggestion made by one of the GMS member countries; the representatives of this organisation felt overall that the work of the RETA team had been conducted with too few inputs from the member countries. For this reason they felt there is little GMS ownership of the RETA outputs.

achieved, but this has partly to do with the generally ambitious design of the RETA in including both "power system development" and environmental aspects under one umbrella. Although the actual achievements of the RETA 6440 have fallen short of Sida's written expectations in 2007, there are some other factors that come into play here. One issue is that the idea for a "GMS Regulatory Forum" was changed to be the RPCC, an agreement for which is now in process to be approved. Another issue was that the FS for two priority regional transmission projects could not be undertaken because, as it turned out, the countries themselves were not ready to develop the envisioned transmission lines at that point. The funds for these two FS were thus, with the agreement of Sida, directed to other priority tasks.

With regard to the final expectation, the ADB explained that a SEA was completed by the EOC on Vietnam's PDP VII instead. This was an interesting development, although the Review Team is not sure how the process and results of this study could be integrated with those of the RETA 6440. At any rate, the AFD is now supporting a new RETA 7764 that includes an SEA of the Master Plan ("Ensuring Sustainability of GMS Regional Power Development.").

4.6 Relevance of RETA 6440 and its Main Recommendations

In the final analysis, the RETA consultants have worked extremely hard to achieve their TORs, and in many ways they were successful in completing the necessary tasks. At the same time, as noted above, the project has done less than expected to facilitate the process of working toward a regional power market. Overall, however, experiences from other regions (see Fig. 2) also show that the development of a regional power market is a process that takes many years. Seen in that context, even the modest accomplishments of the RETA 6440 are relevant both in furthering the process and in creating lessons learned for improved support of that process in future.

4.6.1 Key Recommendations of the RETA 6440 Consultant Team

The RETA 6440 Consultant Team has made a long list of recommendations and sub-recommendations, but the most important one by far is the set of recommendations to set up a GMS Regional Coordination Centre, or as it is now referred to: GMS Regional Power Coordination Centre. The consultants recognised that without a permanent secretariat on power trade, the many different studies and recommendations that were made would not be followed up.

This recommendation has been followed up seriously by ADB with a hired consultant and was taken up for discussion again at the RPTCC-11 in Ho Chi Minh City. The outcomes of the discussion showed that establishing an RPCC is also not an easy task, even when all the parties to the discussion concur on its necessity. Indeed, the RPTCC timeline for the RPCC establishment stretches to 2014. Perhaps it would have been easier to evolve a common understanding on an immediate and medium term concept for an RPCC before entering into detailed discussions on a long term framework while at the same time defining more clearly the tasks that need to be completed by each of the GMS member countries.

It is expected that the RPCC, by virtue of being funded by the member countries, will be able to engender a higher sense of ownership and commitment to the process of establishing a regional power market than has been the case to date. Some of the funding modalities suggested by the RETA team could only be implemented, however, far in the future. An example of this is the idea that the members could pay a certain percentage of either imported or exported energy from power trade as a fee to pay for running costs.

An important point on the RPCC functioning (whether alone or with support from donors) that has not been included is the capacity building and institutional development aspects (the consultant team only recommended capacity building to enhance planning skills in the GMS which is only a small part of what is required). Generally speaking, judging from the set of recommendations, there are still a number of preconditions for a regional power market that will not come under the purview of the RPCC (e.g. establishment of strong regulators and accompanying legislative frameworks).

The social and environmental sustainability issues are given somewhat short shrift under the RPCC. They are mentioned in passing, but not seen as an integral part of the overall regional power market that may influence RPCC's work. There is, nonetheless, a Working Group foreseen on Environment, which will hopefully encourage dialoguing between energy and environmental stakeholders.
A number of the other recommendations made by the consultant team, such as feasibility studies on priority interconnection projects, were supposed to have been completed under the RETA 6440 itself. The RETA 6440 consultant team also has recommended that feasibility studies (FS) be conducted on large-scale hydropower projects for the Mekong mainstream. Considering the outcomes of the recent SEA conducted by MRC, with a recommendation by that consultant team for a ten-year moratorium on mainstream Mekong dams, such an FS should no longer be necessary.

The RETA consultant team has also, more indirectly, made recommendations in the form of the "updated" Road Map that was presented in October 2010. Although the updated Road Map still gives emphasis to the completion of studies, it also includes some important, concrete actions that are prerequisites for the establishment of a regional power market, such as

- Creation of TSOs as grid operators and setting up the Single Buyer Model (national level);
- Drafting of market codes in every GMS country (national level);
- Progressive increase of regulated electricity prices (national level);
- Transfer of the operation of the private lines to the national TSOs (national level).[20]

Unfortunately, it has not been minuted as to whether, or to what extent, the Updated GMS RPT Road Map was accepted by the GMS members.

5. CHALLENGES IN ESTABLISHING A GMS REGIONAL POWER MARKET

As mentioned above, the overall development of the energy sector, including the structuring of markets, in the GMS countries is at a variety of different stages. These big differences remain a major challenge if RPT is to be established in such a way that especially the poorer countries of Laos, Cambodia and Myanmar will be able to benefit equitably from power trade.

Of course, the big driver in favour of the cross-border movement of electricity is the huge and growing demand for it in China, Thailand and Vietnam. All three countries have a greater reliance on thermal sources of energy (coal and gas), and are interested in complementing these with imported hydropower from Laos, Cambodia and Myanmar. In terms of reducing GHG emissions this makes a lot

[20] Another two actions (regional synchronous operation plus transformation of PPAs into "Contracts for Differences") are, perhaps, more related to Stage 3 of an RPT.

of sense. These huge demands, however, may not necessarily lead to the development of a regional power market. It is possible that the big "stakeholders" will prefer to maintain the status quo, or "business as usual" scenarios whereby they import power from their smaller neighbours. As all three have large and growing demands it may be that the economic viability of exchanging power among them may remain doubtful. However, there is a political will, as shown by the IGA and the MoUs, but how this is evolved into concrete actions and what will be the time frame, remains to be seen.

In this chapter, the Review Team summarises the main challenges in establishing a GMS regional power market within the next decade or two.

5.1 National and Regional Grids

The three larger[21] countries in the GMS have all established national grids based on a 500 kV transmission voltage level. Some reinforcements will be needed, especially the North-South 500 kV transmission in Vietnam. However, the three smaller countries (Myanmar, Laos, and Cambodia) do not have a nationwide grid system, and they also do not have national load dispatch centres in operation yet. In Laos such a national load dispatch centre is currently under construction.

Laos, for example, which commands the most central position in the GMS in terms of regional power trade, has so far only 115 kV as its main transmission voltage and still lacks a connection to the southernmost part of the country. The higher voltage level, 230 kV, is under implementation, but for effective regional power trade it would require the construction of a 500 kV grid for Laos. The situation is more or less the same in Cambodia. Myanmar would also need to develop a 500 kV transmission system, because of the large hydro export potential. This is a challenge, since there is no economic viability for the larger investments, but regional power exchange cannot take place without proper transmission infrastructure.

The implications of this situation are that the large importers are securing their electricity needs in the way that best suits them. Thus, the IPP/BOT model with dedicated transmission lines to the purchasing country is enjoying pre-eminence. Power is thus "tied up" under PPAs of 25 years and more.

So far, private investors are looking much more for generation, rather than transmission, projects to invest in. There are substantial costs to develop "backbone" grids with 500 kV transmission lines in Laos, Cambodia and Myanmar, and it may be that only public sector financiers, like WB and ADB, would be interested to support such investments. Even in Vietnam it is estimated that the investments required for transmission lines would be on the order of USD 700 million to one billion per year for the next five years.[22]

5.2 Institutional and Regulatory Frameworks

The institutional and regulatory frameworks in the GMS are in vastly different stages from one another. Perhaps the most important issue to see as a challenge is that two of the six GMS countries

[21] The word "larger" is used in the sense of size of GDP. Myanmar is geographically larger than both Thailand and Vietnam.

[22] An article appearing in the Vietnam News on 12 November 2011 showed EVN's high level of concern in gaining adequate investment capital via loans to strengthen Vietnam's grid; the director general of NPT said that "capital shortage for transmission projects could lead to more power outages . . . in 2013."

do not have energy regulators at all (Laos and Myanmar), while the regulators are not necessarily in a strong position in the other countries, as they may lack adequate staff, capacities and the required independence to carry out their mandate effectively. Thus, a whole host of factors required for regional power trade to take place at all cannot in the absence of regulators and regulatory frameworks. A presentation made at the RPTCC-11 by Ms. Kala Mulqueeny (Senior Counsel from ADB's Office of the General Counsel) on the ASEAN Regulators' Network showed clearly the existing regulatory barriers to RPT. In fact, the list she presented dated back to 2003, but the Review Team is not aware that these barriers have been dealt with. They include:

- Cross-border licensing;
- Expropriation of assets;
- Contractual confidentiality, if justified;
- Consumer protection and safety standards, including grid codes;
- Anti-competitive practices;
- Third party access to transmission system;
- Investment recovery;
- Information access;
- Double taxation agreements;
- Import and export restrictions on electricity;

Indeed, this long list of regulatory barriers to ASEAN interconnection applies directly to the GMS as well. These barriers will have to be tackled at both at national and regional levels if a regional power market is to be established in the GMS. Under RETA 6440, some work has already been done on grid codes, but a top priority for bilateral trade from the list above will be arranging for third party access to transmission systems. The Review Team also concurs with the observations of Ms. Beatrice Arizu (World Bank Policy Note, 2010: 17) when noting one of the main challenges to establishing a GMS regional power market:

- *Coordination and management of the decision-making process, to avoid delays and address barriers at the country level for implementation.*

This coordination and management is not yet in place in the GMS. The planned RPCC will be an important step to achieve this.

5.3 Private Sector Investment Patterns

Challenges related to private sector investment patterns have already been alluded to earlier in the report. The main issue here is that private investors, generally in consortiums, are starting to create an energy landscape in Laos, Cambodia and Myanmar that is based on IPPs with dedicated transmission lines to export power based on long term PPAs to neighbouring countries. Such arrangements then become part of the list of barriers noted above, as there ends up being no third party access to the transmission system (not even by the host country's utility).[23]

With the IPP – BOT model of investment, unless the exporting country is able to negotiate well, the PPAs will likely tie up electricity for approximately 25 years. If this situation continues as it has begun, especially in Laos, then the opportunities for RPT will remain minimal.

[23] This is certainly the case in Laos, where EDL does not have access, let alone control the "export" transmission lines that have been constructed by the power developers.

In one important case that the Review Team is aware of, ADB is trying to assist Laos / EDL to "buy back" a 500 kV transmission line (Nabong – Udon Thani) from the Nam Ngum 2 dam to Thailand (EGAT). The idea here is for several future power projects in the Nam Ngum sub-basin (part of the Mekong Basin) to be able to use the one transmission line and then pay wheeling charges to EDL.[24] So far the Nam Ngum 2 IPP has refused to relinquish control of this transmission line.[25] This has implications both for future development of RPT as well as for social and environmental aspects if three different transmission lines, for example, would have to be constructed from the projects to the EGAT grid in Thailand.

5.4 Perceptions of Energy Security

Of the six GMS members, Vietnam is, perhaps in the most precarious position in terms of energy demand and supply. According to information the Review Team gained from interview, it is currently unable to maintain a significant reserve, while Thailand aims for, and generally achieves, a 15% reserve. Vietnam will be able to import more electricity from Laos and Cambodia in future, but its future will be a more coal-dependent one. Vietnam expects to import greater amounts of coal from countries like Australia and Indonesia, while it has exported some of its own coal to China (buying back electricity from China at a higher price, as reported in the Vietnamese media).

In all cases, however, the urgently felt energy security needs of electricity importers causes them to pursue their national interests above regional interests. From a narrowly defined (supply side least cost) energy security perspective, it certainly makes sense from the importers' point of view to *de facto* extend their grids into countries like Laos, Cambodia and Myanmar that do not currently have grid backbones. In this way, the importers maximise their security as they do not have to rely on a foreign grid that they may see as technically unreliable.

5.5 Demand Side Management Issues and Energy Efficiency

A difficulty to date in the overall RPT process is that it has not given high enough importance to "demand side management" issues. In fact, the term "energy efficiency" cannot be found anywhere in the RPT documentation. In other words, the process, with all its attendant calculations, has been conducted primarily in terms of the supply side; demand projections have not adequately considered the possibilities for demand side management have not been seriously considered.[26] This is, however, changing in the GMS and more governments realise that energy is not an ever-expanding commodity. In Vietnam, for example, we were told that a long run economic vision for Vietnam is to move out of the "energy hungry" heavy industries such as steel and cement.

Demand side management and other energy efficiency issues are under planning in several countries in the GMS. These measures, when implemented, can have some influence in slowing down the high

[24] These projects would include Nam Ngum 3 with ADB lending of USD 465 million for a consortium of investors and Nam Ngum 5 with Sino-Hydro as major investor. The bulk of the power would be sold to Thailand.

[25] As mentioned earlier, financial support has been provided from remaining RETA 6440 funds

[26] As the AFD concept note presented to the RPTCC – 8 emphasised: "Traditional planning approaches . . . put emphasis on supply side solutions. On the other hand, more aggressive demand side management and energy efficiency improvements are cost effective and will lead to substantial savings in investments needs." AFD's presentation at RPTCC – 9 emphasised again the crucial importance of energy efficiency and demand side management to mitigate climate change.

power demand growth rate in the area, but it is challenging to implement Demand Side Management in areas with subsidised prices, because a high price of electricity is still the best "driving force" for DSM and energy efficiency. Affordability of electricity is also an important issue, especially if the subsidies are being abolished.

There are two new RETAs that will look more closely at DSM: RETA 7764 on "Sustainability of RPT in the GMS," with financing from AFD, will emphasise social and environmental sustainability, partly through SEAs. Another RETA (7679) under the umbrella of the "GMS Sustainable Energy Forum" is looking into "Promoting Renewable Energy, Clean Fuels and Energy Efficiency." The results of both of these RETAs should feed into overall development of regional power trade. Their results and recommendations are urgently required in the region for redefining energy security in terms of social and environmental sustainability.

6. CONCLUSIONS

The establishment of a functioning regional power market requires a number of factors to be present: political commitment, technical aspects related to grids for example, and the legislative / regulatory frameworks that also impacts on the structure of the domestic electricity market (e.g. unbundling). The GMS RPT process has enjoyed political commitment at Ministerial level, but the level of commitment from other key stakeholders such as the utilities is less clear. The RPTCC as a forum for Ministries of Energy, utilities and regulators to meet on a regular basis, has facilitated a certain level of common understanding and ongoing commitment by the GMS countries to the concept of a regional power market.

Despite this, however, the instruments available to the GMS countries so far—IGA, MoUs and even the updated Road Map of 2010—have not adequately laid out the concrete tasks that need to take place both domestically and regionally in order for a regional power market to be developed. Thus, while regulators have been established in four countries, their actual roles and the frameworks in which they operate are dissimilar. Vietnam has embarked on a process of internal market reforms in the energy sector, but these are also acknowledged to be achievable only in the long term. The other GMS countries have not yet embarked on processes that would lead to broad-ranging reforms as envisioned in Vietnam.

The Review Team refers here to the observations of Ms. Beatrice Arizu in a World Bank Policy Note (2010: 17) regarding underlying difficulties in the GMS RPT process, as they are also an apt summary of the findings of this Review Mission:

- *Uncertainties as to the final design, or the end of the journey;*
- *Lack of clarity over what regional operational and regulatory institutions will ultimately be needed;*
- *Lack of specificity and detail in the IGA and MoUs both in relation to government commitments and where, in practice, the ultimate decision-making powers lie in relation to critical facets of implementation.*

The sustainability of the underlying aspects related to regional power trade — social and environmental in particular — is not yet anchored in the overall process, although promising beginnings have been made. Social sustainability still requires a much higher level of civil society participation in early planning stages of power generation and distribution projects. Environmental sustainability requires major stakeholders from Ministries of Energy and electricity utilities to be in constant dialogue with Ministries of Environment and representatives of civil society. This dialogue should inform the overall PDPs and finally, the RPT interconnection Master Plan.

Thus, the big question that remains is whether a regional power market is achievable as it was conceptualised in the mid- to late-1990s. GMS country representatives with whom the Team spoke all say that this regional power market is a distant goal. Whether it is 20 years or 30 years in the future, it is clear that many national and regional efforts are still required to build on the current power purchasing agreements in the region. In the final analysis, the countries with hydropower to export—Laos, Cambodia and Myanmar—stand to lose the most if a regional power market is not put in place. They will be able to sell their hydropower, but not under optimum terms and conditions, and not at the best price!

7. LESSONS LEARNED

The lessons learned presented here do not aim to be comprehensive, but reflect some of the main issues which the Review Team came across during its investigations.

Having a regular forum (RPTCC) where representatives of different countries meet regularly is a way of contributing to common understanding in the region, and may also speed cooperation between Member countries on certain issues.

For ongoing facilitation of a complex process and increased ownership by Member countries it is better to have a fulltime Secretariat owned and operated by the Members themselves (but with external support as and when necessary).

Lengthy processes of high complexity such as establishing regional power trade in the GMS require clear timelines broken into small, concrete and achievable steps (i.e., actions beyond studies).

When a process involves economically stronger and weaker parties, it is important to provide support in such a way that favours the weaker parties in order to “level” an uneven playing field (e.g. more focus on capacity building in an early stage).

Training workshops and seminars have the greatest potential to contribute to capacity building when they are systematically followed up both at the regional and national levels. Their potential to contribute will also be enhanced when there is careful participant selection (matching up people’s skills and job descriptions with the content of the workshops).

The involvement of civil society organisations is a necessary precondition for adequately addressing socio-economic, environmental and poverty reduction issues. Stakeholders should also coordinate

with both the EOC and the MRC on social and environmental issues that have bearing on the location and size of power projects.

National and regional data bases will only be maintained when there is a strong sense of ownership by those who are responsible for them, and when others are able to apply the data provided.

Legislation, regulatory frameworks, governmental bodies (independent regulators and TSOs) and mechanisms for trading, imbalances and dispatch have to be in place if a regional power market is to be achieved.

The parties have to agree about the market design (such as a single buyer solution) and do the corresponding legislative work in each country.

Countries have different views and schedules for electricity market liberalization: a major focus should be on removing barriers from legislation and establishing necessary regulatory frameworks.

Subsidies need to be (gradually) removed from electricity pricing in all the member countries, in order to establish a competitive regional electricity market.

Since the regional, competitive electricity market within the GMS may not be operational for at least another 20 years, it is also important to ensure its coordination and consistency with developments in the ASEAN region. Any duplication of efforts should be avoided.

A process such as this can be used effectively to raise attention to and increase understanding of environmental issues since these are recognised as being related to energy investments. However, the evaluation findings suggest that it is much less likely that the stakeholders involved in an initiative such as this would or could be persuaded to take social and gender factors into an account to a meaningful degree as these concerns are perceived to be outside their areas of responsibility.

8. MAIN RECOMMENDATIONS

High Priority Recommendations: Decisions and Action Required in the Short Term

1. Plans for 500 kV grid construction in Laos, Cambodia and Myanmar to establish the minimum "backbone grid" are required. Because of acknowledged difficulties in finding private investors for such projects, support from public investment bodies should be sought: ADB, World Bank, AFD, KfW.

2. Load Dispatch Centres are needed in all countries that have adequate systems and communication facilities to operate interconnected grids (this implies also adequate, skilled personnel to operate such centres).

3. Start a process of genuine bilateral trade on a pilot basis with grid (or partial grid) interconnections that can be agreed upon by the member countries (start with one or two only). This would bring in extremely valuable "learning by doing" experiences in the GMS.

Follow-On from RETA 6440:(Support required in the context of the proposed RPCC)

4. Extensive capacity building and institutional development are needed especially in Laos, Cambodia and Myanmar on technical, economic/financial and regulatory aspects (this should be a high priority support area from Sida and other development partners).

5. Priority legal assistance, including capacity building, should be provided to the electricity exporting countries to enable them to negotiate PPAs with IPPs that will allow for regional power trade. In particular, this would mean different clauses on who controls transmission lines and how.

6. Assistance is still required (via support for the RPCC) to further update the RPT Road Map. It should include agreed upon timelines and milestones for the legislative and regulatory aspects that need to be accomplished both regionally and in each of the member countries.

7. Assistance would be required to further develop mechanisms by which environmental and social issues are given a higher priority in RPT processes; for example, all proposed interconnector projects—including the power generation projects underlying them—should be carefully reviewed and monitored for potential infringement on biodiversity corridors, national protected areas, national parks and the like (close collaboration required on this between RPCC, EOC and new, AFD-supported RETA).

8. RETA 6440 concluded that social and environmental legal frameworks are not yet well in place in several GMS countries—gaps identified by RETA 6440 need to be carefully analysed to see where further support in relation to environmental frameworks could be provided in order to fill them (this would require a seconded expert on environmental issues at the RPCC).

9. Given that prospects are poor for ensuring due attention to social and gender issues through RETA 6440, separate and complementary initiatives should be pursued outside of the framework of RETA 6440 (most notably support to civil society voice on a regional basis and in those countries where democratic conditions are conducive to political engagement by civil society).

10. Regional Power Trade could provide an opportunity to develop more direct mechanisms to address environmental concerns related to energy development and perhaps poverty alleviation through rural electrification, especially in areas affected by the related transmission lines. If the savings resulting from regional power trade could be calculated, a proportion of this could be channelled for these purposes through special funds.

ANNEX 1: Terms of Reference

Review of the Greater Mekong Sub region Regional Power Trade

1 Evaluation Purpose

One experience from the work so far is that developing regional power trading is a complex, difficult and time-consuming process, as similar processes are and have been everywhere in the world. For the GMS, this is emphasized by the diversity among the member countries when it comes to development level and capacity, size of the national power systems, buyer/seller relations, huge investment needs to be made in an environmentally and socially sensitive context etc. Considerable progress has been made but still a number of fundamental issues remain to be resolved in order to achieve a sustainable and efficient power trade regime. Against this background Sida, who has been a partner to the GMS Regional Power Trade process since 2008, has taken the initiative to carry out a review of the RPT process and the Swedish support so far. The review would look at the progress as a whole and give recommendations for the way forward.

The purpose of the review is three-fold:

4. To review and assess the progress of the RPT process so far in relation to the IGA, MoU-1 and 2[27], Development Matrix and Road Map;
5. To briefly review and assess the Outputs and Outcomes of the RETA 6440 against the targets set in the Design and Monitoring Framework;
6. To give recommendations on the way forward for the process, with sustainability in focus (Institutional, Financial, Environmental and Social).

Sida intends to use the review as input to an assessment on whether to continue supporting the GMS power trade process, and as a learning document for support to similar processes. The study is also expected to provide input and guidance for decisions by RPTCC and the ADB on the way forward.

The review will focus on a strategic level and on issues that are of crucial importance for a successful implementation of regional power trade in the GMS sub-region.

2 Intervention Background

The GMS Sub-Region, comprising of Cambodia, Lao PDR, Burma, Thailand, Vietnam and in China the Yunnan and Guanxi provinces, houses a population of about 300 million. See map in Annex 1. Since 1992, the countries of the region have embarked on a program of economic cooperation (the GMS Program) that aims to promote development through closer economic linkages. The GMS Program, with support from ADB and other donors, helps the implementation of high priority sub regional projects in transport, energy, telecommunications, environment, human resource development, tourism, trade, private sector investment, and agriculture.

Building institutional and physical infrastructure for regional power trading has formed an important part of the GMS-cooperation in the field of Energy since the early 1990´s. An Inter-Governmental Agreement (IGA) on regional power trade was signed by the six GMS-countries in 2002. The IGA was followed by two MoUs in 2005 and 2008, with agreed activities and timelines to move the process forward.

[27] MoU-1:"Guidelines for the implementation of the regional power trade operating agreement – Stage 1", 5 July, 2005. MoU-2: "Road Map for implementing the Greater Mekong Subregion cross border power trading", 31 March, 2008.

The process is coordinated by the ADB and governed by the GMS Regional Power Trade Coordination Committee (RPTCC), drawing representatives from energy ministries and power utilities in the GMS member countries. The RPTCC meets 2-3 times per year and the development partners are invited as observers. Recently the RPTCC has started to prepare for a Regional Coordination Center (RCC), located in one of the GMS-countries. The RCC would oversee and coordinate the further development of GMS power trade. The RPTCC has adopted a step-wise approach for the development of regional power trade, Stages 0-3, reaching from harmonising regulations and joint planning, over bi-lateral trade to a fully competitive market. Right now, roughly, the process is moving from step 0 into step 1.

Sida has supported the power trade process since August 2008 through the ADB RETA 6440- "Facilitation of Regional Power Trading and Environmentally Sustainable Development of Electricity Infrastructure in the GMS". The RETA has two components, i.e.

1. Facilitation of Development of Regional Power Trade
2. Capacity Development for Environmental Impact Assessment of Power Projects.

The intervention logic for RETA 6440 is included in the Regional Technical Assistance Report, November 2007, attached in **Annex 2**. The overall development process is documented in a Road Map, which is adopted by the RPTCC. **Annex 3**.

Other major partners to the process are the French AFD and the World Bank. The AFD has financed Technical Assistance since 2006 (RETA 6304) that would help build the capacities of the GMS member countries in developing a regional power market, carry out certain strategic studies and to identify and prepare feasibility studies for potential power interconnection projects within the GMS.

The World Bank (WB) has been participating in the regional power trade meetings since 2004 and has provided technical assistance e.g. to Lao PDR in developing "ownership and benefit sharing" and "best practice in power purchase agreements". The WB supports the GMS power trade cooperation activities that include institutional/policy support and infrastructure financing.

Countries in the GMS region are also engaged in supporting each other, e.g. Thailand is assisting Laos, Myanmar and Cambodia to prepare national power development plans. Similarly the China Southern Grid utility (CSG) has prepared a hydropower master plan for Cambodia and Lao PDR as well as capacity building in rural electrification technology and power market restructuring.

3 Stakeholder Involvement

The review team shall undertake a brief Stakeholder analysis, in order to verify and complement the tentative list below:

- RPTCC
- ADB (South East Asia Department, ….)
- GMS Energy Ministries
- GMS Power Utilities
- GMS Environmental Ministries
- Regional Environmental NGOs
- Other Development partners (AFD, WB, Sida, JICA, ….)
- The Mekong River Commission
- Other GMS Programs (Core Environment Program, GMS Energy Program, etc.)
- The RETA 6440 consultant team
- IPP companies

Sida and the ADB, South East Asia Department, in Manila will meet with the team and provide information and feed-back to review questions. ADB will in addition provide the team with information about the GMS-cooperation, power trade program documents, consultant reports from RETA 6440, other relevant documents like policy papers and work plans, provide contact details and facilitate the contacts with other stakeholders mainly as listed above, etc.

The GMS ministries and utilities will meet with the team and provide feed-back, other relevant information and logistical support if needed. Other stakeholders will be approached as the team see fit and efficient.

The RPTCC, ADB and selected other development partners will be invited to give comments to the draft Terms of Reference for the review as well as draft reports and be invited to a presentation/seminar of the findings and recommendations (the timing and occasion to be decided).

4 Review Questions

The assessment should concentrate on Relevance and Effectiveness. In the Inception report the team should identify and present the main issues in focus for the review. Questions for the review should include but not be limited to:

- Is the Development Matrix relevant in relation to the objective for GMS RPT, as specified in the IGA?
- Are the objectives and design of RETA 6440 relevant for implementing the two MoUs?
- To what extent has the objectives of the RETA 6440 been achieved?
- To what extent are the agreed steps in the two MoUs completed at the current stage?
- Assess the relevance of the final key recommendations from RETA 6440 and how these have been implemented or taken into account in the planning of the further RPT process.
- To what extent is and how could poverty alleviation, social, environmental and gender be better integrated in the RPT process and power system development?
- Assess the current commitment and ownership by the GMS countries to the process.
- How could Sida and other development partners contribute to a continued successful process?

5 Recommendations and Lessons

The review shall draw lessons from the RPT process so far on the main challenges to be addressed and fundamental requirements for a successful RPT process. Furthermore the review shall recommend Outputs and strategic Activities in order to achieve the Outcome:"Good conditions to establish a sustainable (Institutional, Financial, Environmental, Social and addressing Poverty) regional power trade."

6 Methodology

The review should use the methodology outlined below. The review team is encouraged to adjust and further develop the methodology.

Desk Study Prior to Departure for Region:

1. Desk study of key project documents and reports from the RETA 6440
2. Desk study of other documents of relevance to the GMS RPT
3. Brief interviews with selected key stakeholders (only if possible by telephone/skype)

Briefing Meetings Manila and Inception Report:

4. Start-up meeting with ADB and in Manila.
5. Drafting the Inception Report, including work plan, more specific issues for the review, methodology and activities for undertaking the review

6. Continued review of RETA and RPT reports and documentation.
7. Submission of the Inception report to Sida and ADB
8. Feedback or "no objection" by Sida and ADB

GMS RPT Field Investigations:
9. Interviews with RPTCC, ADB, Sida, the RETA 6440 consultant, power utilities, energy- and environmental ministries, development partners like the WB, AFD, NGOs, Independent Power Producers (IPPs), etc. in selected countries: preliminarily Thailand, Laos, Vietnam and China.
10. Follow up of the latest developments of the dialogue on GMS RPT, agreements, guiding documents and other steps continuing the process of RETA 6440.

Consolidation of Preliminary Findings and their Presentation:
11. Put together initial major findings, conclusions and recommendations that can be presented to RPTCC and major development partners at the RPTCC meeting in Ho Chi Minh city between 7-11 Nov

Drafting Review Report
12. Write a draft review report
13. Submit the draft report for feedback from major partners and stakeholders
14. Feedback received

Finalisation and Submission of Review Report
15. Finalise the Review Report based on feedback received.
16. Submit the finalized report

7 Work Plan, Schedule and Reporting

Tentative time schedule for the review:

-	Start of the assignment	September
-	Inception Report	September/October
-	Mission to the region	October/November
-	Draft Report	November
-	Final Report	Mid December

The time schedule could be revised due to the final planning of the field investigations. A presentation of findings and recommendations to key stakeholders should be made at an appropriate time, e.g. in the final stage of preparing the draft report. If there is no particular reason for doing otherwise, the Final Report should follow the structure in the Sida Evaluation Manual.

9 Evaluation Team

The review should be carried out by a team of 2-3 persons. The team shall have expertise in:
- Evaluations.
- Power system development and design of systems for power trade.
- Environmental, social and pro-poor aspects in relation to planning and development of infrastructure.
- The regional context of the GMS region (economic, political, cultural, social, environmental etc.)

The team members shall have at least 15 years of experience in the respective field of expertise, have excellent proficiency in the English language. Working knowledge in any of the major GMS-languages is a merit.

ANNEX 2: Mission Team's Schedule in Southeast Asia

JA = Juhani Antikainen, RG = Rita Gebert, UM = Ulf Møller

Day		Oct	Where?	Who? What?
1.	Su	9 -	Travel to region	RG/JA
2.	M	10	Arrival Bangkok	RG. (JA late arrival in Manila)
3.	T	11	Travel to Manila	RG
4.	W	12	ADB Briefings	RG/JA Meeting with J. Kim and colleagues Meetings with GMS govt reps requested.
5.	Th	13	ADB Briefings	RG/JA Meeting with J. Kim
				Trying to arrange meetings with GMS govt reps.
6.	F	14	ADB Briefings	RG/JA Meeting with A. Jude Meeting with Mr. Javed Mir
				Trying to arrange meetings with GMS govt reps.
7.	S	15	Travel to Bangkok	RG/JA
8.	S	16		RG/JA
9.	M	17	Bangkok	a.m Meeting with CEERD, Dr. Lefevre
				p.m Meeting with Sida Head of Cooperation, Ms. Oltorp
10.	T	18	Bangkok	a.m Video Conference at ADB Resident Mission: Zhai Yongping. Meeting with Core Environment Programme/EOC, Sumit Pokhrel
				p.m Meeting at AFD with O. Grandvoinet, including TeleCon with Carl Bernadac
11.	W	19	Bangkok	a.m/p.m. Meetings with EPPO and with EGAT officials.
12.	Th	20	Bangkok	a.m Meeting with MEE-NET, W. Permpongsacharoen
				p.m. Meeting with International Rivers A. Trandem.
13.	F	21	Bangkok	a.m Document Study
				p.m. Meeting with NESDB Meeting with Mr. Göran Haag
14.	Sa	22	Bangkok – Vientiane	RG/JA
15.	Su	23	Vientiane	RG/JA
16.	M	24	Vientiane	RG/JA a.m. Meeting with MRCS ISH group
				p.m. Meetings with Ministry of Energy and with EDL
17.	T	25	Vientiane	a.m. Meeting with H. Chanphana, MoNRE
				Arrival UM p.m. Meetings with M-POWER, K.. Lazarus and with Pat Dye, NTPC (IPP)

18.	W	26	Vientiane	a.m. Meeting with S. Thiravong, EDL
				pm Meeting with Bui Duy Thanh, ADB pm. Meeting with E. Mann, ADB.
19.	Th	27	Vientiane	a.m Meeting with IFC Investment Officers
				p.m. Meeting with Robert Allen, THPC (IPP)
				Evening video conference with D. Ostojic and other WB energy sector staff
20.	F	28	Vientiane	Consolidating information gathered in Vientiane. Team discussions.
21.	Sa	29	Vientiane	
22.	Su	30	Fly to Hanoi, Guangzhou	RG to Hanoi JA/UM to Guangzhou
23.	M	31	Hanoi, Guangzhou	RG Meetings with NPTC, with EVN and with PanNature
				JA/UM (Guangzhou)
		Nov		
24.	T	1	Hanoi, Guangzhou	RG meeting with ICEM, arranging further meetings in Hanoi
				JA/UM Meeting with CSG
25.	W	2	Hanoi, Guangzhou	RG meeting with Vietnam Rivers Network Arranging final meetings in Hanoi.
				JA/UM to Hanoi
26.	Th	3	Hanoi	Team Meeting Meeting with Institute of Energy
27.	F	4	Hanoi	Meeting with ERAV Interview with Annelie Gabrielson
28.	S	5	Hanoi	
29.	S	6	Hanoi	
30.	M	7	Hanoi	Team discussion on findings and presentation at RPTCC
31.	T	8	Fly to HCM City	RG/JA/UM
32.	W	9	HCM City	RG/JA/UM Attend RPTCC Meeting
33.	Th	10	HCM City	Attend RPTCC Meeting Present findings JA/UM depart
34.	F	11		Follow up meetings with delegates and attendance at SEF. Report prep. RG depart (12 Nov.)

ANNEX 3: List of Persons Interviewed

Name	Organisation	Position
Manila		
Mr. Anthony Jude	ADB, SE Asia Department	Director Energy Division, Southeast Asia
Mr. Javed Hussain Mir	same	Director Environment Natural Resources & Agri Division
Mr. Jong-Inn Kim	same	Lead Energy Specialist
Mr. Shunsuke Bando	same	Senior Regional Cooperation Specialist
Mr. Jesusito Tranquilino	same	Consultant on the GMS Programme/RETAs
Mr. Ronald Butiong	ADB, Central & West Asia Department	Head, Central Asia Regional Economic Cooperation Unit
Bangkok		
Dr. Thierry Lefevre	CEERD	Director
Mr. Francois Lefevre	CEERD	Administrator
Ms. AnnaMaria Oltorp	Sida Bangkok	Head of Development Cooperation Section
Mr. Göran Haag	Sida Stockholm Regional Programme for Asia	Senior Programme Manager
Mr. Zhai Yongping	ADB (Manila)	Director Energy Division, South Asia (by VideoCon)
Mr. Sumit Pokhrel	GMS Core Environment Programme (EOC)	Energy/Climate Change Coordinator
Mr. Olivier Grandvoinet	AFD	Project Manager, Environment & Infrastructure Division
Mr. Carl Bernadac	AFD (Paris)	Energy Adviser (by TelCon)
Mr. Witoon Permpongsacharoen	MEE Net	Director
Ms. Ame Trandem	International Rivers	SE Asia Programme Director
Mr. Suthep Chimklai	EGAT	Director, System Planning Division
Mr. Tawatchai Sumranwanich	EGAT	Head, Transmission System Development Planning Section
Mr. Samerjai Suksumek	EPPO, Min. of Energy	Director, Power Policy Bureau
Ms. Punnee Rojrungsrithum	EPPO	Senior Policy & Plan Analyst
Mr. Panupong Sathorn	EPPO	Policy and Plan Analyst
Dr. Porametee Vimolsiri	NESDB	Deputy Secretary-General
Ms. Chompunuch Ramanvongse	NESDB	Policy and Plan Analyst
Vientiane		
Mr. Voradeth Phonekeo	MRC Initiative on Sustainable Hydropower	Project Manager,
Mr. Simon Krohn	MRC same	CTA
Mr. Chansaveng Boungnong	Ministry of Energy & Mines, Dept of Electricity,	Director

	Power Sector Planning Division	
Mr. Sanhya Somvichith	same	Deputy Director
Mr. Boungnong Bouttavong	EDL	
Mr. Heuan Chanphana	GMS National Secretariat in MoNRE	Assistant Head
Mr. Amanothong	MoNRE	Staff
Ms. Kate Lazarus	M-POWER and CGIAR Challenge Programme on Water & Food	Water Governance Specialist
Mr. Pat Dye	NT2 Power Company	Government Affairs & Corporate Communications Director
Mr. Sisavath Thiravong	EDL EDL – Gen	Deputy Managing Director Managing Director (new post)
Mr. Bui Duy Thanh	ADB Laos Resident Mission	
Dr. Liz Mann	same	Social Safeguards Specialist
Phongsavanh Phomkong	IFC (Laos)	Investment Officer
Eugene Sullivan	IFC (Hanoi)	Principal Investment Officer Infrastructure
Ms. Patricia Ramos	World Bank (Laos)	
Mr. Robert Allen	Theun-Hinboun Power Co. Ltd.	General Manager
Mr. Dejan Ostojic	World Bank Energy Sector (Washington)	(by Video Conference)
Mr. Tang Jie	same	same
Mr. Veasna Bun	World Bank (Phnom Penh)	same
Ms. Julia Fraser	World Bank (Bangkok)	same
Guangzhou		
Mr. Shi Shengguang	China Southern Power Grid	Director, International Dept.
Ms. Long Qing	CSG	Division of Economic and Trade, International Dept.
Dr. Luo Bing	CSG	Deputy Director of Technology Department
Mr. Hu Feixiong	CSG	Division of Strategic Planning, Planning and Development Dept-
Mr. Jin Xiaoming	CSG	P.S.Specialist, Power System Research Dept.
Mr. Deng Xiaowen	CSG	Division Chief for Division of Economic and Trade, International Dept.
Hanoi		
Mrs. Luong Lan Dung	National Power Transmission Corporation, International Cooperation Department	Director
Mr. Tran Dang Khoa	Electricity of Vietnam	Deputy Director Power Market

		Department
Mr. Trinh Le Nguyen	PanNature	Executive Director
Mr. Jeremy Carew-Reid	ICEM	Director
Mr. Ashley Kingsborough	ICEM	Environmental Engineer
Mr. Tuan Anh Nguyen	Institute of Energy International Cooperation Department	Director
Mrs. Nguy Thi Khanh	Vietnam Rivers Network	Network Coordinator
Ms. Pham Thi Lan Anh	same	VRN Coordinator
Mr. Nguyen Anh Tuan	Institute of Energy	Deputy Director-General
Mr. Nguyen An Tuan	same	Director International Cooperation Division
Mr. Tang The Hung	ERAV Centre for Power Market Development	Director
Mr. Trinh Quoc Vu	ERAV Planning & Demand Supply Balance Monitoring Dept.	Deputy Director
Mrs. Annelie Gabrielson	EU Energy Initiative, Power Development Fund, Brussels	Former Sida secondee to ADB Manila on GMS RPT (by phone)
Mr. Michel Caubet	European Energy Partners	Former Team Leader of RETA6440
Dr. Romeo Pacudan	RETA 7679: Promoting RE, CF & EE in the GMS	Team Leader/Senior Energy Specialist

ANNEX 4: Selected List of Documents Consulted[28]

- ✓ Beatriz Arizu et al. (2010) Policy Note: Regional Institutional Arrangements to Develop Power Trade in the GMS. For World Bank East Asia and Pacific Region.

- ✓ Country presentations at RPTCC Meetings.

- ✓ Economic Consulting Associates, 2010. "The Potential of Regional Power Sector Integration: GMS Transmission & Trading Case Study." For ESMAP.

- ✓ EOC, 2009 "Harnessing Hydropower for Development: An SEA for Sustainable Hydropower Development in Vietnam."

- ✓ Darryl S. L. Jarvis (2009). "Risk, Regulation and Governance: Institutional Processes and Political Risk in the Thai Energy Sector." Publication of the Lee Kwan Yew School of Public Policy, National University of Singapore.

- ✓ Minuted discussions of RPTCC Meetings.

- ✓ MRC (study by ICEM) 2010. SEA of Hydropower on the Mekong Mainstream: Final Report.

- ✓ RETA 6440 reports and studies.

- ✓ Dao Trong Tu et al. 2011. Sustainability Assessment of Vietnam's Electricity Planning." For M-POWER and CGIAR Challenge Programme on Water and Food.

- ✓ Building on Success, A Strategic Framework for the Next Ten Years of the Greater Mekong Subregion Economic Cooperation Program, Asian Development Bank (November 2002)

- ✓ Project Appraisal Document on a Proposed Credit to the Kingdom of Cambodia for the Rural Electrification and Transmission Project, The World Bank (November 2003)

- ✓ The GMS Beyond Borders, Regional Cooperation Strategy and Program 2004-2008, Asian Development Bank (March 2004)

- ✓ Midterm Review of the Greater Mekong Subregion Strategic Framework (2002-2012), Asian Development Bank (2007)
- ✓ Project Appraisal Documents on Proposed IDA Grants to the Kingdom of Cambodia and to the Lao People's Democratic Republic in support of the Greater Mekong Subregion Power Trade Projects, The World Bank (May 2007)

- ✓ Technical Assistance to Regional Power Trade Development and Capacity Building for Environment Impact Assessment and Monitoring of Power Projects in the Greater Mekong Subregion (GMS), Sida Assessment Memo (October 2007)

[28] This list is not intended as a bibliography; it is merely to give indication of some of the documents consulted by the Review Team.

- ✓ Building a Sustainable Energy Future, The Greater Mekong Subregion, Asian Development Bank (2009)

- ✓ Electricite du Laos, Annual Report 2009

Documents for Regional Power Trade and Interconnection in the Greater Mekong Subregion:

1. Inter-Governmental Agreement on Regional Power Trade in the Greater Mekong Subregion (signed in November 2002)

2. Guidelines for the Regional Power Trade Coordination Committee (Adopted at first RPTCC meeting July 2004)

3. Memorandum of Understanding on the Guidelines for the Implementation of the Regional Power Trade Operating Agreement – Stage #1 (signed in July 2005)

4. Memorandum of Understanding on the Road Map for Implementing The Greater Mekong Subregion Cross Border Power Trading (signed in March 2008)

- ✓ Project Appraisal Document on a Proposed Grant to the Lao People's Democratic Republic for a Technical Assistance for Capacity Building in the Hydropower and Mining Sectors Project, The World Bank (December 2010)

- ✓ Facilitating Regional Power Trading and Environmentally Sustainable Development of Electricity Infrastructure in the Grater Mekong Subregion, Final Narrative and Financial Report 2010 on the Implementation of Regional TA No. 6440-REG, Asian Development Bank (December 2010)

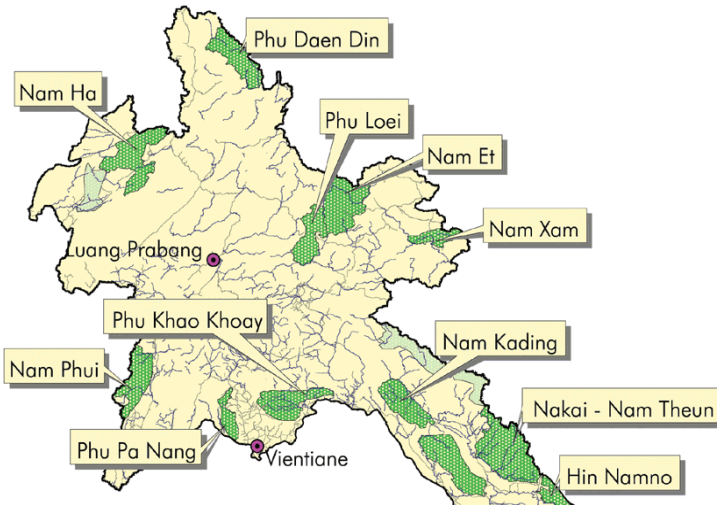
- ✓ Greater Mekong Subregion, Economic Cooperation Program, Information Kit, Asian Development Bank (September 2011)

- ✓ Electricity Regulatory Authority of Vietnam: Five Year (2010)

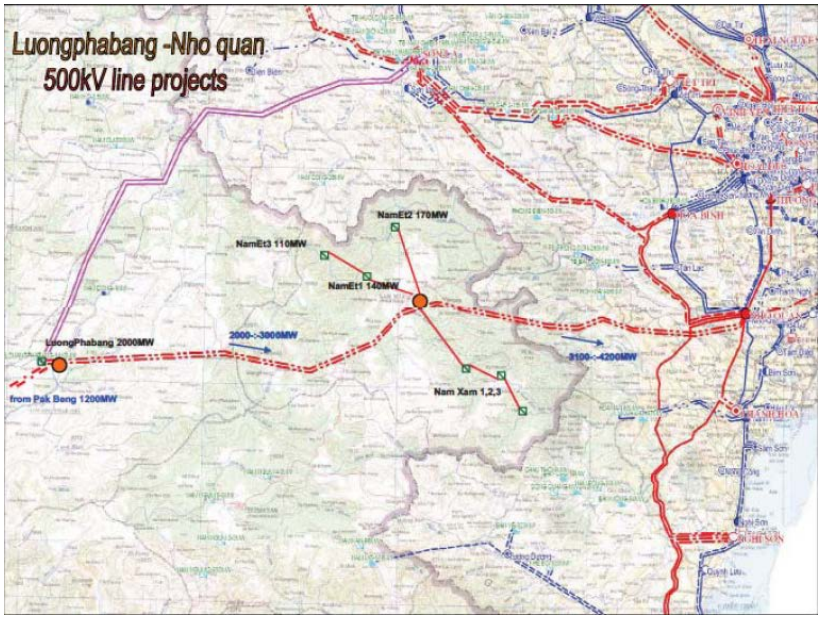
ANNEX 5: Maps

Examples of planned power projects /transmission lines and protected areas

The maps in this Annex are for indication only. They do not purport to be accurate. Nonetheless, the maps show that NPAs or biodiversity corridors do not play much of a role in energy planners' overall considerations for project location.



Northern Laos: National Protected Areas
Map from Mekong Protected Areas Website



Vietnam Power Project / Transmission Line Proposals
Map from Vietnam Country Presentation to RPTCC – 9.

Although the projects shown here may not be implemented, it is noticeable that the east – west transmission line would cut through one and perhaps two protected areas. Dams are planned on the Nam Et River, part of Nam Et – Phou Loey Protected Area (last home of tiger in Laos).

ANNEX 6: RETA 6440: List of Completed Reports under Component Two

Environmental Aspects of RPT

Component Two Module Reports:

Module: EIA/EMP
"Analysis of EIA/EMP in the Greater Mekong Subregion (GMS) Countries and Identification of Gaps, Needs, and Areas for Capacity Development."

Module: EMP/SDP
"Recommended EMP & SDP Annexes to the Concession Agreements of Large Power Development Projects."

Module SEA
"Analysis of SEA in GMS Countries, and Identification of Gaps, Needs and Areas for Capacity Development."

Pilot Study Proposal
"Capacity Building on Strategic Environmental Assessment (SEA) in the Context of Vietnam's Power Development Plan VII (PDP VII).

Relevant Workshop Reports:

Component Two: Regional Stakeholders Consultation Workshop, Bangkok, July 2009

EIA Regional On-the-Job Training, Bangkok, September 2009.

SEA Regional On-the-Job Training, Bangkok, September 2009.

Regional EMP-SDP Training, Lao PDR, July 2010.

Relevant Mission Report:

RETA 6440 Report Covering the RETA Consultants' Mission to Thailand, Vietnam, Cambodia and Laos (2009). The report covers discussions held on environmental issues.

Note: All Reports available from CEERD, Bangkok.

REVIEW OF THE GREATER MEKONG SUB-REGION REGIONAL POWER TRADE

The Greater Mekong Sub-region (GMS) countries, with the assistance of Asian Development Bank (ADB) and other donors, started a program of economic co-operation in the early 1990s. Building institutional and physical infrastructure for Regional Power Trading (RPT) has been among the focus areas from the beginning. Sida has been a partner to the RPT process since 2008, and has financed through ADB a major Regional Technical Assistance work (RETA 6440 - Facilitation of Regional Power Trading and Environmentally Sustainable Development of Electricity Infrastructure in the GMS). The Review of the Greater Mekong Sub-Region Regional Power Trade looks at the progress and achievements of the RPT process so far, as well as relevance of the RETA 6440 and its recommendations in the process. The evaluation provides recommendations on the way forward, with special emphasis on sustainability (institutional, financial, environmental and social).

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