Road Map for Expanded Energy Cooperation in the Greater Mekong Subregion (GMS)

Rationale for Expanded Energy Cooperation

Given the widespread energy poverty of the Greater Mekong Sub-region (GMS), coupled with recent global developments- such as financial turmoil, fluctuating energy prices, pressures on the environment, geopolitical uncertainties of energy supply, interconnectedness of global energy markets- GMS countries today have never felt a stronger need for an integrated approach to deliver sustainable, secure and competitive energy.

Regional cooperation as en effective way to ensure cost-effective energy supply The GMS's energy sector initiatives have centered around the power sector, with focus on cross-border electricity trading, and the interconnection of transmission networks to connect strong energy demand growth centers with rich indigenous energy resource centers. The GMS countries recognize that access to energy is critical to economic development and that there are potential benefits to be gained from expanding cooperation in energy beyond the power sector. Each country has individual energy needs and different resources; integrated regional planning and coordination allow for identification of most cost-effective energy projects as some individual national markets are too small to justify large investments needed for economy of scale. Cross-border energy supply also allows diversification of sources and enhances energy supply security.

Regional cooperation as en effective way to mitigate climate change The need for responses to climate change in GMS is real and imminent, as the region is expected to suffer from many of climate change's most detrimental impacts from sea level rise, changing precipitation patterns and more intense tropical storms. Coupled with recurring food, oil and financial crises, climate change will have very serious implications for the region's economic development and the livelihoods of its population. Mitigation measures to addressing climate change needs public policy actions not only at the national level, but also at the regional level. Regional cooperation and integration have the potential to enhance efficiency of the entire regional energy system by exploiting subregional resources in an optimal manner with least environmental impact. Moreover, regional cooperation will also enable propagation of best practices in developing energy efficiency, renewable energy and clean energy technologies.

This proposed road map for expanded cooperation in the energy sector in the GMS is developed taking into account GMS Strategic Framework (SF), 2002-2012 and the need for improved energy security in the GMS, better utilization of energy resources, and mutually beneficial energy trade, to meet national and regional energy needs in a sustainable manner. This road map presents: (i) the goal and strategic objectives for expanded GMS energy cooperation, to provide overall guidance to the GMS countries energy cooperation, (ii) a desired policy framework that include the measures and actions that should be given priority in expanding GMS energy cooperation; and (iii) a concrete, practical and implementable short to medium-term (2009-2015) work plan that details the specific activities and general timetable for realizing the road map's objectives.

Goal and Strategic Objectives

The goal of GMS expanded cooperation is to deliver sustainable, secure, competitive and low carbon energy in the subregion through a cooperative and integrated approach. Specifically, the road map for expanded GMS energy cooperation will focus on the following four major strategic objectives:

(i) Enhance access to energy of all sectors and communities particularly the poor in the GMS through promotion of best energy practices in the subregion.

(ii) Develop and utilize more efficiently indigenous, low carbon and renewable resources, while reducing the subregion's dependence on imported fossil fuels.

(iii) Improve energy supply security through cross-border trade while optimizing use of subregional energy resources.

(iv) Promote public-private partnership and private sector participation particularly through small and medium sized enterprises for subregional energy development.

Policy Framework

In order to in enhance access to energy of all sectors and communities in the GMS, following policy measures and actions will be considered:

a. Making regional cooperation as a pillar of national energy strategy, with establishment of interconnection arrangements that will harness the energy complementarities existing in the subregion, such as in natural gas, in addition to current efforts in GMS power trade development.
b. Promotion of innovative, cost-effective rural electrification schemes for poverty reduction, taking advantage of regional grid infrastructure development.
c. Promotion of best regional practices of off-grid/ decentralized energy systems for integration and accelerated development of isolated areas using in particular, renewable energy resources.
d. Coordination with other GMS cooperation in transport, trade, agriculture, tourism to maximize synergies.

In order to develop and utilize more efficiently indigenous, low carbon, renewable resources, following policy measures and actions will be considered:

e. Sharing experiences in energy efficiency, renewable and clean coal technologies and recommending suitable practices and appropriate standards for GMS countries.
f. Promoting use of renewable energy resources, including biomass, biofuels, solar (photo-voltaic), wind, micro-hydro, and other locally-available energy sources by up scaling best practices and pilot projects in GMS.
g. Promoting development of subregional engineering and manufacturing capacity for renewable energy such as mini-hydro, wind and solar.
h. Enhancing energy efficiency and conservation at both the demand and supply side, improving their availability and affordability by up scaling best practices and pilot projects in GMS.
i. Ensuring benefit sharing and risk monitoring from energy projects in one GMS country that impact on other GMS countries.

j. Developing technologies and promoting best practices to improve efficiency of thermal power plants particularly for locally available gas and coal.
k. Developing institutional capacity to develop renewable energy projects particularly mini hydro using clean development mechanism (CDM).
l. Monitoring international technical progress (including costs) in carbon capture and storage (CCS) for GMS countries' awareness and for consideration in their future energy development plans.

In order to improve subregional energy supply security, the following policy measures and actions will be considered:

m. Strengthen information exchange and collaboration among national and regional institutions in energy policy and planning and supply security through establishment of a community of practice (COP) for subregional energy development.
n. Enhance institutional and technical capacity in developing cross-border trade and energy integration beyond the power sector.
o. Improve the transport modal mix to sustain growth in the transport sector.

In order to promote public-private sector partnership and private sector participation particularly through small and medium-sized enterprises in subregional energy development, the following policy measures and actions will be considered:

p. Enhancing institutional and regulatory environment conducive for private sector investment.
q. Sharing and coordination of best practices in terms of incentive package provided to private project sponsors.
r. Promotion of networking and exchange of knowledge and experiences on the state of art energy efficiency, renewable and clean energy technologies adapted to the needs of the subregion.

Medium Term Thrusts and Work Plan (2009-2015)

Guided by the above stated strategic objectives and policy framework while taking into account the existing energy cooperation framework of ASEAN countries to maximize synergies and reduce duplication, GMS countries identify the medium term thrusts (2008-2015) for the specific GMS energy subsectors, and their corresponding priority projects/ activities as specified in the Work Plan (Appendix 1).

To realize the goal of expanded energy cooperation, the Work Plan (2009-2015) includes the priority regional initiatives (i) promoting environmentally-sustainable regional power trade planning, coordination and development in the GMS, with a view to establishing a joint program for comprehensive promotion of SEA and other environmental management tools to ensure that environmental and social aspects, including cumulative and indirect impacts are considered at an earlier stage in the power sector plans in the GMS; (ii) improving energy efficiency (EE) through demand side management (DSM) and energy conservation (EC) in the GMS, with a view to establishing a joint program to ensure rapid development and adoption of DSM and EC programs and reduce energy consumption per unit of GDP generated; and (iii) promoting the development of renewable energy sources such as biogas, solar, wind, hydro, geothermal etc.

and clean fuels such as compressed natural gas (CNG), ethanol etc. in the GMS, with a view to establishing a joint program to promote and propagate best practices and realize a more optimal energy mix that reduces greenhouse gas emissions in the subregion.

In the power subsector, the focus will continue to be the development of a regional power market through a two-pronged approach: providing the policy and institutional framework for power trading, and developing the grid interconnection infrastructure to connect the various GMS power systems as specified in Vientiane Plan of Action. In the oil and gas subsector, GMS countries will support realization of GMS segments of Trans-ASEAN Gas Pipeline (TAGP) and promoting the development of environmental friendly oil and natural gas logistics and network in the GMS. In the coal subsector, while recognizing its importance in meeting the countries' energy demand, effort will be made to promote clean coal technologies, including using IGCC for coal power plants.

Implementation of the Road Map

The implementation of the Road Map will be guided by the following principles and procedures:

- In order to ensure GMS ownership of the projects in the Road Map, a GMS member country will assume the "Lead" role in the development of specific projects included in the Road Map.

- As "Lead", the GMS member country will be tasked to oversee the progress of its assigned project, including the formulation and refinement of the project proposal, and coordination with development partners for possible financing and technical support to the project.

- The GMS countries also agree to hold regular meetings, at least once a year, of the Subregional Energy Forum (SEF): (i) to regularly monitor the progress of the Road Map; and (ii) to serve as the vehicle for information sharing in GMS energy cooperation.

- The GMS countries agree to adopt performance targets in order to properly monitor and reflect the successes in realizing their goals, at both the national and subregional levels, in various areas of the energy Road Map.

Appendix 1: Work Plan (2009-2015)

Medium Term Thrusts	Priority Projects/ Activities
New and Renewable Energy (NRE) Sources	
1. Enhancing the policy and institutional framework for development, financing and private investment in NRE	a. Regional framework for RE development (coherent policy for stimulating investments in NRE in GMS context) b. Small scale clean generation fund (study for fund to support community based clean generation like micro hydro, biofuels/ biomass, micro-grids, solar, etc.) c. Renewable energy resource assessment studies (research and development, demonstration projects in GMS) d. Promoting the development of renewable energy and clean fuels in GMS
2. Promoting utilization of biofuels and biomass.	a. Sharing best practice in biofuels b. Biomass generation project (piloting of private/ community-owned biomass-fired power plants) c. Coordination between SEF and Working Group on Agriculture (WGA) on Rural Renewable Energy (RRE) Project d. Training on Biodiesel at the community level
3. Strengthening of information networking particularly in GMS-appropriate NRE technology.	a. Study on networking for propagating GMS-appropriate NRE (e.g. dissemination of findings/ applications of the WGA's RRE project) b. Renewable energy advocacy program for the GMS
Energy Efficiency (EE) and Conservation	
1. Promoting information sharing/ dissemination and networking on best practices in the GMS context.	a. Study on development of GMS EE network (sharing of EE practices in GMS context, such as improving fuel conversion for power plants for the GMS grid, energy audits for industries in GMS corridors, etc.) b. Improving energy efficiency (EE) through demand side management (DSM) and energy conservation (EC) in the GMS c. Implementing public awareness campaign for energy conservation particularly in residential sector
2. Expanding private sector involvement through enhanced energy management in industrial and commercial sectors.	Study of prospects of public-private partnerships for EE (covering (i) government owned buildings, enterprises in special economic zones, (ii) hotels [with Tourism Working Group], and (iii) revolving fund, tax incentives and promotion of energy services companies)
3. Promoting energy efficiency in the transport sector.	a. Study on promoting carbon-neutral GMS economic corridors (included in Environment Operations Center [EOC] work program) b. Energy efficient transport modal mix (with Subregional Transport Forum [STF]) c. Improvement of transport system efficiency d. Study for promoting use of electric cars in GMS

Medium Term Thrusts	Priority Projects/ Activities
	countries
4. Expanding financing for energy efficiency initiatives.	Regional energy efficiency program (support for studies/ fund windows for broad range of EE programs)
Regional Energy Planning, Policy and Program Coordination	
1. Strengthening the energy policy and planning, and program management, coordination and networking in the GMS.	a. GMS energy database development, publications, and networking (under SEF supervision, to be linked to RPTCC database and website) b. Sharing of methodology and analysis for developing each country's economy and energy development plan c. Training needs analysis and capacity building program for energy initiatives in the Road Map (in coordination with ASEAN Plan of Action on Energy [APAEC]) d. Study on accreditation schemes for energy managers/ technical personnel in the GMS e. Study on initiative for oil stockpiling and strategic reserves for enhanced oil security within GMS f. Sharing of knowledge and experience in nuclear energy development, safety issues, and public information/ awareness campaigns
2. Ensuring sustainable financing and support for initiatives under the road map for expanded GMS energy cooperation.	Regional project preparation TA facility (for funding studies for priority projects under the road map)
Power	
1. Establishing the policy and regulatory framework for power trade in the GMS (including building capacity for power trade operation, coordination and grid interconnections).	Major items include (i) regional power database and website; (ii) development of performance standards; and (iii) developing the regional transmission and regulatory authority.
2. Developing the grid interconnection infrastructure and power generation projects for export.	a. Priority interconnections such as: GMS Laos (Nabong)- Thailand (Udon Thani) Power Transmission; Viet Nam-PRC (Yunnan) 500 kV Interconnection; Laos (Ban Sok)- Vietnam (Pleiku); Laos (Ban Sok) – Cambodia (Stung Treng)- Vietnam (Thay Ninh); China (CSG grid)-Laos-Thailand (Nong Don) 500 KV Interconnection; Myanmar (Shweli)-China (Yunnan Interconnection) b. Power generation projects such as: - Lao PDR: Export of 7000 MW to Thailand, including Nam Thuen 2 Hydro (920MW), Nam Ngum 2 Hydro (615MW); Theun Hinboun Hydro Expansion (220MW), Nam Tuen 1 Hydro (523 MW), Nam Ngum 3 Hydro (440MW); 5000MW exports to Vietnam including Sekaman Hydro 1-4 (907 MW); Nam Kong Hydro 1,2,3 (240 MW); - Cambodia: Lower Sesan II + Lower Srepok II Hydro (420 MW), Steung Treng Power Hydro (980MW),

Medium Term Thrusts	Priority Projects/ Activities
	Sambor Hydro (2600 MW); - Myanmar: Shweli Hydro 1,2,3 (600MW+460MW+360 MW)
3. Expanding power coverage to all (rural electrification).	a. Power distribution and rural electrification projects linked to backbone transmission lines (e.g. GMS Northern Power Transmission Project of Lao PDR) b. Development of decentralized (off-grid) energy systems for integration of isolated areas (e.g. review of policy/ regulations, incentives for private sector investment, sharing technology and piloting of micro/mini hydropower) c. Piloting of smart subsidies for the use of RE technologies in off-grid systems (e.g. feed-in tariff for renewable energy)
4. Promoting environmentally sustainable development of electricity infrastructure.	a. Coordination between RPTCC and Environment Operations Center (EOC), e.g., conduct of strategic environmental assessments (SEAs) for the power sector, and environmental impact assessments (EIAs) for energy projects b. Promoting environmentally-sustainable regional power trade planning, coordination and development in GMS
Oil and Gas	
1. Supporting realization of GMS segments of Trans-ASEAN Gas Pipeline (TAGP).	a. Review of identified GMS segments of TAGP, other possible segments (e.g., production-distribution logistics, facilitation of contractual arrangements for exploration/ supply of gas, pipelines and interconnection policy, etc. b. Sharing experience and best practice on regulatory issues and legal framework
2. Promoting the development of oil and natural gas logistics and network in the GMS.	a. Development/ propagation of the use of natural gas in transport (e.g. Thailand tax incentive and revolving fund for natural gas in vehicles) b. Coordination of efforts to enhance energy market integration in ASEAN (ASCOPE-HAPUA)
3. Mitigation of environmental risks in construction/ operation of pipelines.	Conduct of Studies (on safety and security of oil/ gas pipelines, environmental risk mitigation, research and development on carbon sequestration, etc.)
Coal	
1. Promotion of energy efficiency, clean coal technologies and reducing carbon emissions from coal plants.	Abated Clean Coal Generation (promotion of carbon abatement technology); Development of energy efficiency and clean coal technology, and sharing of technology with other GMS countries
2. Strengthening of policy and institutional framework to enhance GMS trade and private investments in the coal subsector.	a. Coal liquefaction and carbon neutrality technical assistance (study on technical viability of coal to liquids processes). b. Monitoring international technical progress (including costs) in carbon capture and storage (CCS)