



**USAID**  
FROM THE AMERICAN PEOPLE

# USAID SUSTAINABLE MEKONG ENERGY INITIATIVE RESULTS OF CLEAN ENERGY EXPERTS ROUNDTABLE

*June 2015*

## *Developed For*

*United States Agency for International Development (USAID) by ICF International*

## **DISCLAIMER**

*The author's views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.*



**Table of Contents**

Executive Summary ..... 2

Introduction ..... 2

World Café – Identification of Critical Issues ..... 4

Initial Insights on Energy Efficiency Renewable Energy (EERE) Market Trends and Opportunities in the Lower Mekong ..... 6

Landscape Analysis: Elements of EERE ..... 8

Opportunities and Barriers to Clean Energy and Energy Efficiency in the Lower Mekong..... 11

Pathways: Planning the Approach ..... 13

Summary ..... 17

Appendix A – Roundtable Participants..... 19

Appendix B – Table Group Landscape Analysis..... 22

Appendix C – Table Group Opportunities/Barriers..... 29

Appendix D: Pathways: Planning the Approach Maps..... 32



## **Executive Summary**

Economic growth is driving the need for dramatic increases in energy production in the Lower Mekong<sup>1</sup> region, most of which is based on conventional energy sources: coal, natural gas, oil, and large-scale hydropower. The impacts will be far-reaching, both for global greenhouse gas emissions as well as for regional eco-systems, human health, fisheries and livelihoods throughout the Mekong basin. While Lower Mekong countries expect to triple their renewable energy capacity in solar, wind and biomass in the next 10 years, they are starting from a low baseline of only 3,500 megawatts (MW), therefore increased capacity would still only account for a small percentage (less than 10%) of installed capacity.

To better inform how best to influence the regional approach to increased use of clean energy, a group of regional experts with domain expertise in clean energy, energy efficiency, and the environment participated in a roundtable discussion in April 2015. This report summarizes the key outcomes of those discussions and is designed to provide input on next steps in the regional approach to increased clean energy capacity.

Experts agreed that energy security, energy access and energy supply and demand were the most critical energy issues facing the region. After further elaborating on the key components of the regional landscape, experts identified the potential for regional integration, availability of renewable energy technologies, and availability of financial mechanisms as some of the greatest opportunities for the region. Conversely, experts considered fragmented policy, coordination across ministries, lack of an independent regulatory body and the lack of integrated and transparent planning to be the most significant barriers.

Given the political, environmental, and socio-economic factors in the Lower Mekong, local experts worked together to create possible pathways for implementing Energy Efficiency/Renewable Energy (EERE) at scale in their region. Although a wide variety of strategies were presented and discussed, experts agreed that stakeholder involvement in several key arenas (including business partners, government agencies, legislative bodies, utility providers, research institutions, and media partnerships) was essential to the success of EERE initiatives.

USAID initiated this roundtable to be a platform where experts can benefit from exchanging their ideas on the critical energy issues in the region while concurrently providing expert guidance for USAID's participation in the Sustainable Mekong Energy Initiative.

## **Introduction**

This report details the results of a two-day expert roundtable on priority challenges and needs in the Energy Efficiency/Renewable Energy (EERE) sector in the Lower Mekong region. Roundtable insights will inform USAID's Regional Development Mission for Asia (RDMA) planning discussions including possible areas of focus for the Sustainable Mekong Energy Initiative. The roundtable took place in Bangkok Thailand, April 23-24, 2015.

A group of regional experts with domain expertise in EERE, social science, economics, finance, the environment and regional knowledge participated in the roundtable discussion. U.S. government staff

---

<sup>1</sup>Lower Mekong countries include: Cambodia, Laos, Myanmar, Thailand, and Vietnam



also attended the conference as audience members. A complete list of attendees can be found in Appendix A.

The roundtable focused on critical barriers and opportunities to EERE at scale and the actions and steps to consider for further enabling development of EERE at scale in the region. USAID/RDMA is considering the design of a project to support Lower Mekong countries to direct future investment in power development toward environmentally-friendly renewable energy and energy efficiency, leading to significantly reduced greenhouse gas emissions and increased investment in EERE. This report explains how experts collaborated during the roundtable, summarizes key insights from these interactions and provides a synthesis of the main themes that permeated the discussion.

The key questions posed to participants included:

- What are the critical energy issues in the Lower Mekong region?
- What are the key elements of the energy landscape in the Lower Mekong region and how do they influence EERE at scale?
- Where are the opportunities to influence EERE? Where are the barriers to EERE?
- What are the actions you would take to achieve EERE at scale?
- Who are the actors and which of their capabilities would you leverage?

The SMEI roundtable consisted of small group discussions and exercises to stimulate discussion and facilitate information exchange. The roundtable agenda can be found in Appendix B.

Mr. Alfred Nakatsuma, Director of USAID's Regional Environmental Office (REO), opened the roundtable by explaining the background of the SMEI. To explain the purpose of the SMEI, Mr. Nakatsuma cited Secretary of State John Kerry's announcement of SMEI in which he explained the purpose is to, "encourage the countries of the region to develop programs that will redirect their investments to innovations in renewable energy and other sources that do not harm the environment." Mr. Nakatsuma explained that the USAID two-day roundtable discussion of the energy needs of the Lower Mekong region represented the first step towards this goal. Ultimately, USAID plans to use insights from this meeting to inform programs promoting equitable and sustainable economic development in the Lower Mekong region.

Mr. Nakatsuma also explained that in the Lower Mekong region, consideration must be given to growing energy demands and the need for increased energy generation. In order to ensure a safe and sustainable energy supply to meet increasing demand, EERE alternatives must be considered. Currently, USAID is working with the U.S. Department of Energy's National Renewable Energy Laboratory (NREL) to conduct analyses and field visits. Once the analyses are completed in July 2015, USAID will begin developing design documents for a September 2015 – February 2016 procurement of technical assistance. This will allow the 5-year SMEI implementation to tentatively begin in March of 2016.<sup>2</sup> In order to meet the SMEI objectives, implementation should be guided by the expertise of ADB, the World Bank, ASEAN Clean Energy, Overseas Private Investment Corporation (OPIC), U.S. Trade and Development Agency (USTDA), U.S. Department of State (DOS) and the U.S. Department of Energy

---

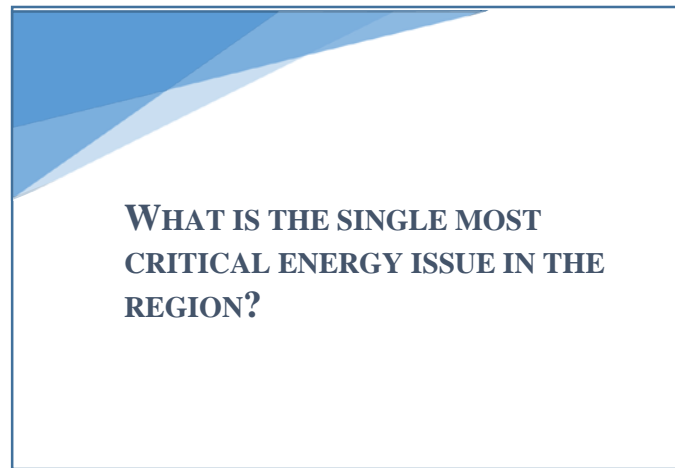
<sup>2</sup> Note that timeline is only notional and may be subjected to change.



(DOE), among others. Mr. Nakatsuma explained that the goal of USAID’s roundtable discussion was to serve as a platform where experts could benefit from exchanging their ideas on the critical energy issues in the Lower Mekong region. Fostering collaboration in this way sets the stage for successful SMEI implementation.

### **World Café – Identification of Critical Issues**

To begin the roundtable discussion and better understand what was “top of mind” from the experts’ point of view, USAID asked the experts to participate in an exercise that would both introduce participants to one another and gather participant’s primary concerns related to energy in the region.



Participants were asked to consider and write down the response to the following question:

Once individual issues were identified, the experts were asked to discuss with fellow roundtable members and then post the issues into one of six categories: Institutions, Technology, Policy, Market/Financial, People, and Resources.

Figure I below summarizes the results. The most commonly identified critical issues included:

- Energy access
- Energy security
- Energy supply and demand

Institutions	Technology	Policy	Market/Financial	People	Resources
<i>The Governance of energy</i>	<i>Energy access</i>	<i>Supply options to ensure energy security, inclusiveness, and sustainability (4)</i>	<i>Energy supply</i>	<i>Energy access and affordability (2)</i>	<i>Uneven energy demand, access, and generation across the region</i>
<i>Systematic causes of exponential growth in energy demand</i>	<i>Local capacity in engineering and technology; access</i>	<i>Mainstreaming &amp; Integrating EERE into energy planning processes</i>	<i>Fossil fuel subsidy</i>		<i>Demand growth "sustainability" (2)</i>
<i>Energy development plans and investments are dominated by conventional technology and unsustainability</i>		<i>Meeting growing demand, decoupling supply and GHG Emissions</i>	<i>Lack of transparency in decision making</i>		<i>Energy supply</i>
		<i>To value energy efficiency as a resource</i>	<i>Resource (Demand/ Supply) Efficiency, Clean</i>		
		<i>Energy development vs. environmental deterioration including social issues</i>			
		<i>Creating real energy competition in the market; Promotion of clean energy development</i>			

**Figure 1: Critical Energy Issues in the Lower Mekong Region**

The notes with a number in parenthesis (e.g., (2)), indicate that the issue was remarked upon by more than one expert. Because of differing viewpoints among experts, some notes fall under multiple categories. For example, “Energy supply” appears on two notes, once under Market/Financial and once under Resources. Similarly, “Energy development vs. environmental deterioration including social issues” appears on one note, but spans both Policy and Market/Financial.



## Initial Insights on Energy Efficiency Renewable Energy (EERE) Market Trends and Opportunities in the Lower Mekong

Mr. Dan Bilello of NREL presented initial insights on EERE market trends and opportunities in the Lower Mekong. To provide background and set the context for the roundtable discussion, Mr. Bilello presented six key elements and related questions that impact sustainable energy planning:

1. **Resources:** Quantifying and valuing the natural, intellectual, and financial resources that are needed to develop a vibrant EERE sector is critical to understanding and optimizing EERE potential and opportunities over the longer term.
2. **Technology:** As these markets get to scale, EERE technology cost and performance characteristics are changing rapidly in a positive direction. Within these changing technology environments, planners must consider tradeoffs between domestic production and import strategies, unique local requirements, the interactions between different technologies, and the role of storage.
3. **Infrastructure:** How do we ensure system reliability? As EERE expands in the Lower Mekong, spatial planning, managing urbanization and rural modernization must be considered. What are the built environment, transportation, smart grid, and demand growth options? How do we maximize the efficiency of these systems?
4. **Markets/Financial:** Financial considerations include how projects get financed, what the supply chain looks like, and the sources of innovation. The markets that affect EERE are also impacted by the interactions of policy, price signals, and consumers. These factors inform the deployment of these technologies and their use.
5. **Institutions:** Institutions play a critical role in informing how these technologies complement one another and support national policy objectives. Weighing trade-offs and designing policies and regulatory environment are noted in this category. Code design and enforcement should also be considered as they can play an important role in accelerating energy efficiency.
6. **People:** Consumer acceptance and technology uptake. What is the level of end user awareness of energy choices? Additionally, what role does workforce development and education play?

Mr. Bilello noted that these six elements are necessary to consider when evaluating EERE market trends and opportunities. The key is to consider and optimize these elements with strategic intent to: ensure energy security for economic growth; advance social and environmental priorities; steward intellectual, human and natural resources; and engage in the local region. Optimizing EERE use while balancing these priorities is a challenge (see Figure 3). The optimal outcome depends both on national priorities as well as the relative value placed on both inputs and outputs. In the rapidly changing world, inputs and assumptions need to be sound, but flexible, to account for change in the markets.

There are three significant trends driving investment and decision-making for EERE in the region:

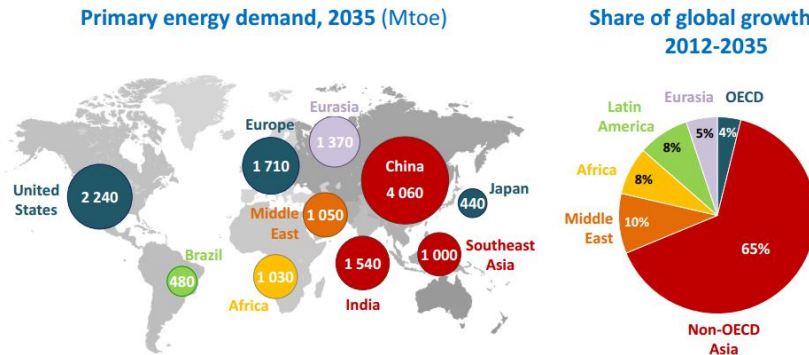
1. **Commodities, energy demand, and dynamic policy environment**
  - o Commodities and energy demand are changing at an increasingly fast and upward rate (see Figure 2<sup>3</sup>).

---

<sup>3</sup> Source: IEA, World Energy Outlook 2013



- Rapid growth in energy demand is anticipated in Asia, including in the Lower Mekong region.
- While placing unique challenge to planners, rapid urbanization also creates new opportunities for energy efficiency as populations are more centralized.
- EERE policy is playing a critical role in accelerating the deployment of these technologies.



**Figure 2: Future Energy Demand**

**2. EERE cost trends and capability at scale**

- New EERE investment has increased from \$40 billion in 2004 to \$300 billion in 2014.
- Despite rapid growth in these markets, the International Energy Agency (IEA) estimates \$1 trillion annually will be required to meet a goal of 450ppm/2 degree Celsius change.
- Global share of non-hydro renewable energy to global power production has nearly doubled since 2004 (3.5% to 6%).
- China is driving EERE market growth in the region.

**3. New technologies and new business models**

- There is a substantial scale of technology in the region.
- Some institutional capacity is overburdened because of demand growth and lagging infrastructure.
- New technologies and new business models are quickly changing the traditional structures through which energy is produced, delivered, and used.
- Regional coordination, grid interconnections, and low cost storage have the potential to radically alter the energy landscape in the region.

Challenges to EERE	Important Trends and Opportunities
<ul style="list-style-type: none"> <li>• Overburdened institutional capacity</li> <li>• Demand growth and lagging infrastructure</li> <li>• Transparency, consistency, and efficiency</li> <li>• Market distortions and price signals</li> </ul>	<ul style="list-style-type: none"> <li>• Urbanization and rural modernization</li> <li>• Geographic proximity of resources and demand</li> <li>• Data access and tools for analysis at all levels</li> </ul>



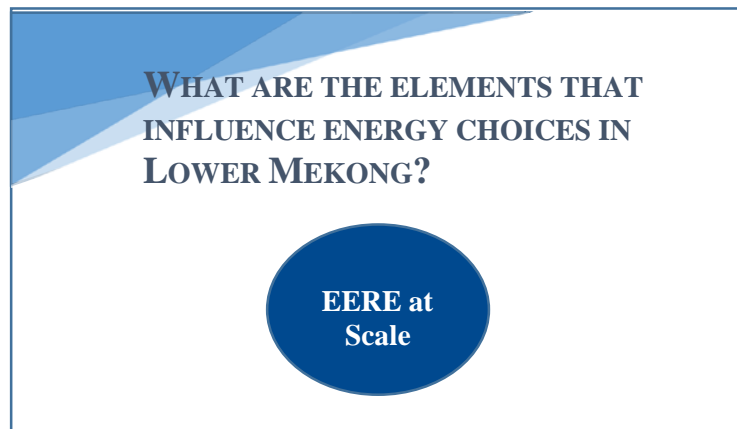
<ul style="list-style-type: none"> <li>• Divergence in priorities and needs</li> </ul>	<ul style="list-style-type: none"> <li>• Improved understanding of energy decisions on economic vitality, sustainability, and security</li> </ul>
--	---

**Figure 3: Sample EERE Challenges and Opportunities**

Initial research indicates that a divergence in priorities and needs, which vary greatly depending on the region, creates an environment where solutions that are relevant across countries and localities are less common. A changing landscape, however, has facilitated the emergence of opportunities such as increased data access and analysis, urbanization and rural modernization, and improved understanding of energy decisions. In conclusion, traditional energy decision making is often based on lowest cost solutions that do not reflect other policy objectives or externalities. EERE may present additional opportunities to achieve broader policy objectives such as improved energy security and advance long term and sustainable economic growth.

### **Landscape Analysis: Elements of EERE**

In this session, participants were asked to brainstorm the elements that influence energy choices in the Lower Mekong. The goal of the exercise was to consider elements of Energy Efficiency and Renewable Energy at Scale. Using *EERE at Scale* as the focus, participants were asked:






In teams, participants structured their discussions around the relationships between key elements that influence investment decisions and energy choices and, in some cases, considered policy storylines that substantially impact the conversation. Participants elaborated on six categories (Institutions, Technology, Policy, Market/Financial, People and Resources) using a diagramming method. The themes and main points that emerged from the discussion across the four groups are outlined in the table below (see Figure 4). A complete list of results organized by table groups may be found in Appendix C. It is important to note that key topics that should be considered, but were not discussed during the session include:




- Education
- Workforce development
- Data and information
- Energy/water nexus



At the conclusion of the session, there was a call for collaboration among donors and organizations to create robust, unified solutions.

Element	Sub-Element/Considerations for EERE at Scale in Lower Mekong
<p><b>Institutions</b></p> 	<ul style="list-style-type: none"> <li>• Need for governance transparency               <ul style="list-style-type: none"> <li>○ Utilities and regulators hold a large amount of power, transparency and independence are critical</li> </ul> </li> <li>• Capacity of Institutions (are there enough resources?)</li> <li>• Coordination within the country and regionally               <ul style="list-style-type: none"> <li>○ Is there overlap?</li> </ul> </li> <li>• Capability of Institutions (do they have the right skills?)</li> <li>• Pathway dependency – an institution can have a historical goal that tends to remain constant over time, without readjustment</li> </ul>
<p><b>Technology</b></p> 	<ul style="list-style-type: none"> <li>• Appropriate, affordable, sourcing for domestic and international sources and scalability are key technology considerations</li> <li>• Access and policy are primary challenges, rather than availability of technology               <ul style="list-style-type: none"> <li>○ There are challenges in modern energy access</li> <li>○ Not the main issue – policy and political economics are more important. The technology is there</li> </ul> </li> </ul>
<p><b>Policy</b></p> 	<ul style="list-style-type: none"> <li>• Impact of government policy               <ul style="list-style-type: none"> <li>○ Government programs, policies, and mandates                   <ul style="list-style-type: none"> <li>▪ Role of subsidies and other incentives</li> </ul> </li> <li>○ What is the government’s support of EERE?</li> <li>○ Utility transparency?</li> </ul> </li> <li>• Implementation challenges               <ul style="list-style-type: none"> <li>○ Diverse policies across the region                   <ul style="list-style-type: none"> <li>▪ Due to country differences, it is hard to implement solutions with diverse country by country policies</li> </ul> </li> <li>○ Lack of certainty on how policies will play out in future</li> <li>○ Ability to enforce</li> </ul> </li> <li>• Challenges in policy planning               <ul style="list-style-type: none"> <li>○ Transparency of policy development process</li> <li>○ Influence of international policy and strategy</li> <li>○ Lack of independent regulatory functions</li> </ul> </li> <li>• Lack of alignment across factors               <ul style="list-style-type: none"> <li>○ There is fragmentation across sectors (food, water, energy)</li> <li>○ Lack of resource planning across energy efficient appliances</li> </ul> </li> </ul>



<p><b>Market/Financial</b></p> 	<ul style="list-style-type: none"> <li>• Consider regional architecture</li> <li>• Energy access</li> <li>• Conflict of utility vs. public interest             <ul style="list-style-type: none"> <li>○ Support utilities or reduced energy use?</li> <li>○ Influence of energy prices (wholesale and retail), and its influence on feasibility of energy efficiency</li> </ul> </li> <li>• Actual (low) vs. perceived (high) cost of technology</li> <li>• Issues with tariff schemes             <ul style="list-style-type: none"> <li>○ Fossil fuel/electricity subsidies make renewables adopted on a large scale difficult</li> </ul> </li> <li>• Availability of public, private, international financing</li> </ul>
<p><b>People</b></p> 	<ul style="list-style-type: none"> <li>• Need to build buy-in/support             <ul style="list-style-type: none"> <li>○ Address misconceptions</li> <li>○ Spread the word                 <ul style="list-style-type: none"> <li>▪ Lack of awareness of people’s ability to influence energy use</li> </ul> </li> <li>○ Must consider impact of society/culture on electricity use                 <ul style="list-style-type: none"> <li>▪ Grid vs. distributed generation</li> </ul> </li> </ul> </li> <li>• Need to understand demographics             <ul style="list-style-type: none"> <li>○ How affordable is EERE? Do they have access to the power?</li> <li>○ Behavior, growing GDP affects behavior</li> </ul> </li> </ul>
<p><b>Resources</b></p> 	<ul style="list-style-type: none"> <li>• Use of Fossil Fuels             <ul style="list-style-type: none"> <li>○ Availability/Scarcity</li> <li>○ Unless renewable energy becomes cost competitive, coal and nuclear are the most likely to be considered</li> <li>○ Regional differences</li> </ul> </li> <li>• Understanding how energy assessments impact the country</li> <li>• Sustainability – links to broader aspects of energy policy development down to the granular level</li> <li>• Need to facilitate resource sharing             <ul style="list-style-type: none"> <li>○ Within the country and across the region</li> <li>○ Access to capital/lack of capital</li> <li>○ Energy security</li> <li>○ Increasing energy demand</li> <li>○ Renewable energy resources influence – more developed using the resources of less developed countries.</li> </ul> </li> <li>• Need access to land for EERE             <ul style="list-style-type: none"> <li>○ Needs to be available to make transactions happen</li> <li>○ As the grid expands, there are areas still that are off grid. How do these intersect?</li> </ul> </li> </ul>



	<ul style="list-style-type: none"> <li>• Resource endowment throughout the region</li> </ul>
--	--

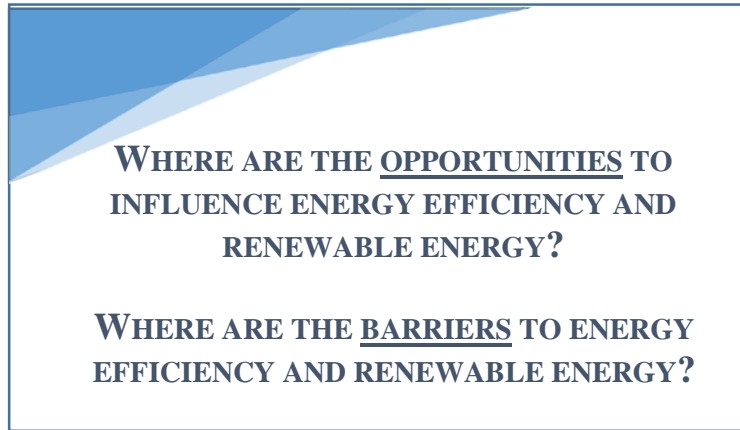
**Figure 4: Considerations for EERE at Scale**

## **Opportunities and Barriers to Clean Energy and Energy Efficiency in the Lower Mekong**

Two main goals of the roundtable were to identify key opportunities to improve EERE initiatives in the Lower Mekong and recognize barriers to those same initiatives. In order to obtain an accurate and comprehensive consensus from the roundtable participants, USAID conducted several iterations of brainstorming and discussion. The outcome was a prioritized list of critical opportunities and barriers. The method used to reach consensus, as well as the results are detailed below.

### **Method**

Initially, roundtable participants were asked to individually consider the following questions:



Once each participant had brainstormed responses to the above questions, they were again split into small table groups. Each group engaged in discussion and selected the most critical opportunities and barriers. This ensured that all researchers, donors, and regional perspectives could be recognized. When initial perspectives were raised there were similar ideas expressed from participants in the identified barriers/opportunities. Then, each group was asked to present a summary of their findings to the larger group. The outcome was a list of responses that the entire roundtable finalized through additional discussion. Once the list was finalized, the expert participants were asked to prioritize the top three opportunities and barriers. The final prioritized list appears in Figure 5 below. See Appendix D for a complete list of opportunities/barriers by table group.



<b>Opportunities</b>
Regional integration and cooperation lead to achieving national security goals (11)
EERE technology exists, that in and of itself creates opportunity (9)
Availability of variety of financing mechanisms for clean energy – private sector sees EERE as non-marginal investment, government getting out of the way, perceived risk is going down, rural grassroots projects building pipeline of projects (8)
Creation of green jobs, green industry, organizations, and educational programs (6)
Build capacity of new generation of engaged, empowered consumers – builds capacity of new generation – declining cost of renewable energy technologies, willingness today, new business models (4)
International climate policy – Green Climate Fund and other funding sources, greenhouse gas reduction commitments (Intended Nationally Determined Contributions - INDC) facilitating good cooperation between ministries (environment and energy) (3)
Regional connectivity for efficient use of resources – includes natural resources, knowledge resources, financial resources (3)
New and existing technologies are now bankable – technologies are available and economically viable, influx of investment and financing, there are many tools, lessons learned, and best practices that can be applied through capacity building and awareness raising (1)
Costs of clean energy resources are decreasing – wide range of technologies and resources available, will become more affordable over time and reach grid parity, energy efficiency is least cost energy resource (1)
Regional coordination and cooperation – Greater Mekong Sub-Region (GMS), Lower Mekong Initiative (LMI) ASEAN Economic Community, knowledge exchange, best practices, leapfrogging, learning for each other mistakes, joint functions of non-governmental organizations (NGOs), Civil Society Organizations (CSOs), Community-based Organizations CBOs (0)
Regional integration and cooperation – experience exchange, training, integrated power system planning (e.g., ASEAN grid), interconnected guidelines and standards, mechanism for renewable energy trade and balancing (0)
EERE technology and policy incentives – decreasing EERE costs, incentives and policies for EERE deployment (0)



<b>Barriers</b>
Institutional arrangements, coordination, and capacity – coordination across ministries, capacity to develop and implement (human, technical), policy fragmentation, lack of integrated planning, unclear mandates (12)
Lack of integrated, transparent planning and regulation – limited public participation, renewables are afterthought, no independent regulatory body, focus on conventional, large scale investments, pricing omits externalities (10)
Market distortion (7)
Lack of informed decision making process – public participation is minimal, public awareness of true cost of energy is minimal, lack of points of entry for public to weigh in, lack of knowledge from grassroots to academic (6)
Limited implementation capacity – contract design, negotiating capacity and consequences (5)
Centralized power planning and market structure – same institution makes investments, sets the price, does planning, owns infrastructure, bids on power purchase agreements without independent regulation, asymmetric negotiation (3)
Centralized decision making/provision of energy (3)
Inadequate energy planning – politics of planning, limited long-term strategic direction, standard practices (Strategic Environmental Assessment, Integrated Resource Planning) not adopted, technological and institutional lock-in (1)
Subsidies and appropriate pricing – fossil subsidies, social and environmental cost, appropriate tariff design (0)
Lack of EERE investment incentives – Conditions for private investment, stable policies, transparent policy design (0)

**Figure 5: Prioritized List of Opportunities and Barriers**

### **Pathways: Planning the Approach**

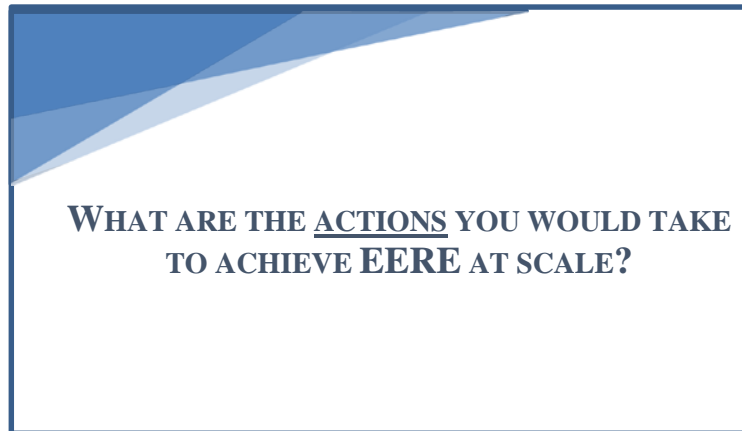
Using the opportunities and barriers as a starting place, participants were split into three groups and asked to map a way ahead for achievement of EERE at scale. This exercise was designed to elicit pathways that would help USAID support EERE at scale in the Lower Mekong. The activity resulted in three process maps, each detailing a different strategic plan. Where possible, groups identified key actors during critical stages in their proposed plan. This section provides an overview of the methodology used to create the process maps and strategies. In addition, following are key takeaways



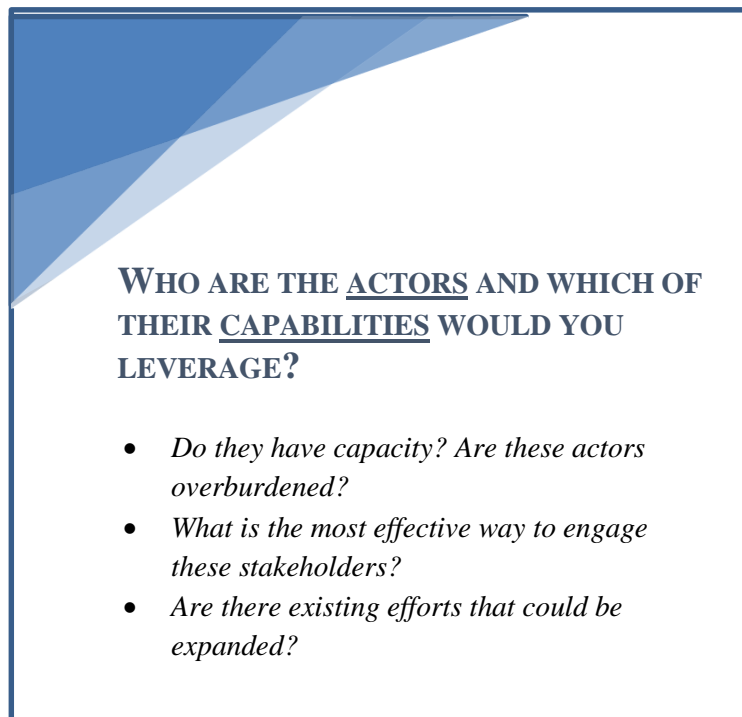
from each group session, accompanied by a summary of each group's discussion and a matrix of the key actors in their process. The final process maps created by each group appear in Appendix E.

## Method

In groups, participants were asked to first consider the following question:



Each group created a process map to accurately capture their ideal path forward for achieving EERE at scale. The processes generated were never strictly linear, and varied greatly across the groups. After each group had created their process map, they were asked the following questions:







After the teams considered these questions they recorded their answers on sticky notes. Then, they were asked to place their notes on the applicable parts of their process diagram. A summary of each group's plan for moving forward is below.

### Team 1

This team's approach highlights the importance of stakeholders (particularly consumers and international donors) in the plan to impact EERE. As such, the plan suggests approaches to assist in enhanced power planning and engage NGOs and media to grow consumer awareness in energy decisions. The outcome of this plan is to improve the grid and promote EERE entrepreneurs.

Other key points discussed:

- Participation from consumers and international donors is recommended for impact
- NGOs and media should be engaged to grow consumer awareness in energy decisions
- Technical assistance/guidance from entities such as USAID provided to governments to assist in enhanced power planning is advised
- It is important to define and concretely understand the supply and demand at the beginning of the process; necessary to develop policy targets
- This plan recommends improved energy demand forecasting, as current government assessments are thought to be unrealistic/inflated
- Inaccurate demand forecasting plus combined with a lack of deregulation results in no incentive to identify and pursue energy efficiency options. All incentives are on the consumer side, but there is not very much within government/industry

The specific actions this group identified to achieve EERE at scale include:

1. Transform Government systems/policies toward liberalized energy market governance
2. Improve Generation Planning (DRP)
3. Support prices to reflect true (private and public) costs and eliminate subsidies
4. Improve Grid:
  - a. Management
  - b. Access
  - c. Regional Connectivity
  - d. Efficiency
5. Build a platform to promote a collective of small scale RE/EE entrepreneurs
6. Empower consumers and other stakeholders to inform energy decisions
7. Improve demand forecasting
8. Qualify renewable energy supply and energy efficiency potential to inform planning

### Team 2

This team of participants identified process steps to achieving EERE at scale and divided them into categories over a five year process. The categories include:

- Data and Information for Decision Making (DI)
- Private Sector Investment (PS)
- Regulatory Environment (RE)/Policy and Planning (PP)



- Awareness and Education (AE)
- Codes and Standards (CS)

Years 1-2 consist of improving data and information for decision making. Years 2-3 involve developing a roadmap for energy efficiency targets and portfolio targets once resources are better understood. Over years 2-5, this process will initiate methods for information sharing, developing codes and standards and promoting private sector investment. The classifications are linked and interdependent and commence with data collection and policy and planning, followed by more technical activities. Data and policy steps must come first so that a baseline is outlined, resources are defined and serve as a basis to measure progress and identify necessary actions. A summary of the actions in each category appears below.

#### DATA AND INFORMATION FOR DECISION MAKING

1. Develop information on EERE technology performance (possibly a database)
2. Develop a regional energy information database
  - a. Data – limited data exists at the national level (Laos, Cambodia). Without data, investors won't come in to invest in energy efficiency technologies
  - b. Develop robust data to support decision making
  - c. Two types of data information – (1) resource availability (country-specific); (2) the type of data that needs to be shared across the region on demand (operational data)
3. Develop data on EERE potential/resource (data hub)
4. Assess co-benefits of EERE

#### PRIVATE SECTOR INVESTMENT

1. Promote private sector delivery of energy efficiency services (i.e., Energy Service Company or 'ESCO' model)
2. Increase investment in EERE (engage with financial institutions)
  - a. What is needed to link investors with projects? Raise awareness and build capacity
  - b. Engage with banks (raise awareness); find financing for Small Medium Enterprises/increasing financing for renewable energy projects

#### REGULATORY ENVIRONMENT

1. Analyze and develop renewable energy incentives
2. Phase out fossil fuel subsidy
3. Promote competition and transparency in power markets
  - a. Liberalize/decentralize – promote competition and transparency, empowerment
4. Promote effective and independent regulation

#### BOTH POLICY AND PLANNING & REGULATORY ENVIRONMENT:

5. Develop mechanism for regional renewable energy trading (guidelines, transmission infrastructure, etc.)

#### CODES AND STANDARDS

1. Develop energy efficiency building codes
2. Harmonize energy efficiency standards for appliances and equipment



### Team 3

This team developed a long-term approach in which many action steps would be implemented in parallel. The team began with the idea of creating a “deliberative integrated platform.” This platform would serve as a model to work out many of the prescribed actions required and act as a steering committee. The team suggested that successful, location-specific approaches for EERE at scale (such as Bangkok), can be scaled up for implementation on a national, then regional level. This team suggests implementing the approach at a sub-national or urban level to help effect change.

Other key points discussed:

- This model requires interaction between members and thereby should facilitate emergence of leadership.
- Implementation should be focused at an urban level, mastering in one city, and scaling up from there.

The specific actions this group identified to achieve EERE at scale include:

1. Support regional cooperation and integration for EERE
2. Harmonize energy efficiency standards for appliances, buildings; create accreditation/certification bodies
3. Scale up best practices in community-level energy cooperative groups for off/on-grid supply
4. Build capacity of networks of civil society and small businesses to influence power policies
5. Conduct utilities/regulators exchange program; share best practices
6. Strengthen independent regulators for increased transparency and accountability
7. Implement Integrated Resource Planning
8. Enable smart grid development and demand side management – policies - institutions

## Summary

The goal of the roundtable was to gain specific insights from local and regional experts on critical barriers and opportunities to accelerating energy efficiency and renewable energy deployment in the Lower Mekong region. By the end of the roundtable, experts had identified regional integration, availability of technology, and availability of a variety of financing mechanisms to be the greatest opportunities in Lower Mekong. Further exploration of private sector investment, data, awareness, and education are top priority areas for consideration.

Conversely, experts considered fragmented policy, coordination across ministries, lack of an independent regulatory body and the lack of integrated and transparent planning to be the most significant barriers. Experts noted that policy and planning is a significant enough of a barrier to edge out other factors when considering how to shape the path forward.

Furthermore, while the components of implementing EERE at scale are well understood in theory, pervasive market distortions continue to impede significant growth in EERE outside of large scale hydropower. Despite these obstacles, strong policy frameworks in the region are important components of the energy landscape and represent an opportunity to leverage strong leadership and targeted efforts to implement EERE at scale. However, roundtable participants noted the importance of



a holistic EERE at scale solution that addresses the financial and resource related challenges. Therefore, roundtable participants were reticent to suggest that funding and effort should be funneled solely to policy related initiatives. No matter the eventual outcome, the collaboration and knowledge sharing fostered by the roundtable paved the way for continued cooperation and further discussion on practical approaches to EERE at scale in the Lower Mekong Region.



**Appendix A – Roundtable Participants**

<b>Name</b>	<b>Organization</b>	<b>Position</b>	<b>Country</b>
<b>Beni Suryadi</b>	ASEAN Centre for Energy	Executive Director	Indonesia
<b>Kate Lazarus</b>	World Bank Group, IFC	Environmental Specialist	Laos
<b>Anbumozhi Venkatachalam</b>	Economic Research Institute for ASEAN	Senior Energy Economist	Indonesia
<b>Sumit Pokhrel</b>	Greater Mekong Subregion Core Environment Program	Deputy Technical Program Head	Thailand
<b>Vitoon Permpongsacharoen</b>	Mekong Energy and Ecology Network	Director	Thailand
<b>Carl Middleton</b>	Chulalongkorn University	Lecturer	Thailand
<b>Kongchheng Poch</b>	Economic Institute of Cambodia	Researcher	Cambodia
<b>Nam Hoai Nguyen</b>	Institute of Energy Science	Energy Systems	Vietnam
<b>Duc Loc Nguyen</b>	Center for Sustainable Energy Development	Deputy Director	Vietnam
<b>Milou Beerepoot</b>	GIZ	Director of Thai Energy Eff. Project	Thailand
<b>U Aung Myint</b>	Renewable Energy Association of Myanmar	General Secretary	Myanmar
<b>Chong Chi Nai</b>	Asian Development Bank	Director, Southeast Asia, Energy Division	Philippines
<b>Tira Foran</b>	Australia Commonwealth Scientific and Industrial Research Organisation	Researcher	Australia
<b>Peter du Pont</b>	Nexant	Vice President, Government Services	Thailand
<b>Arianne Ducreux</b>	AFD	Director for Thailand & Myanmar	Thailand



<b>Olivier Grandvionet</b>	AFD	Project Manager, Sustainable Energy and Transport	Thailand
<b>Ryan Siegel</b>	SecondMuse	Associate	USA
<b>Tahra Vose</b>	U.S. Embassy Bangkok	Scientific & Technology Affairs Officer	Thailand
<b>Rachaneekorn Sriswasdi</b>	U.S. Trade and Development Agency	Deputy Regional Manager for Asia	Thailand
<b>Geoffrey Tan</b>	Overseas Private Investment Corporation	Managing Director for Asia & Pacific	Thailand
<b>Dan Bilello</b>	U.S. Department of Energy, National Renewable Energy Laboratory	Lab Program Manager	USA
<b>Jennifer Leisch</b>	U.S. Agency for International Development (USAID), Bureau for Economic Growth, Education and Environment	Climate Change Mitigation Specialist	USA
<b>Jayne Somers</b>	USAID, Asia Bureau	Energy Advisor	USA
<b>Alfred Nakatsuma</b>	USAID, Regional Development Mission for Asia	Director, Regional Environment Office	Thailand
<b>Dan Whyner</b>	USAID, Regional Development Mission for Asia	Deputy Director, USAID Regional Environment Office	Thailand
<b>Sarah Bieber</b>	USAID, Regional Development Mission for Asia	Environment Officer	Thailand
<b>Sithisakdi Apichatthanapath</b>	USAID, Regional Development Mission for Asia	Clean Energy Program Development Specialist	Thailand
<b>Meg McCarthy</b>	USAID, Regional Development Mission for Asia	Partnerships and Coordination Specialist	Thailand



<b>Brandon Sitzmann</b>	USAID, Regional Development Mission for Asia	Regional Science & Technology Integration Advisor	Thailand
<b>Teresa Leonardo</b>	USAID, Regional Development Mission for Asia	Regional Science & Technology Advisor	Thailand

**Figure 6: Roundtable Participants**





**Appendix B – Roundtable Agenda**

**Objectives:**

- To identify barriers and opportunities to investment in clean energy and energy efficiency in the Mekong region
- To provide strategic direction to USAID’s Sustainable Mekong Energy Initiative and inputs into National Renewable Energy Laboratory’s analysis
- To provide a forum for exchange of ideas as well as coordination and networking among experts

Thursday April 23, 2015

<b>Time</b>	<b>Topic/Description</b>	<b>Presenter/Lead</b>
<b>8:00 – 8:30</b>	Welcome: Opening Remarks  Agenda Review/Introductions	Mr. Alfred Nakatsuma, Director, USAID Regional Environment Office  Ms. Lisa Gabel, Facilitator
<b>8:30 – 9:00</b>	Background on RDMA Work in Lower Mekong and the Proposed Sustainable Mekong Energy Initiative (SMEI)  Format: Presentation followed by Q&A  Objective: Provide context and goals for the roundtable	Mr. Alfred Nakatsuma, Director, USAID Regional Environment Office
<b>9:00 – 9:45</b>	World Café: Networking Ice Breaker  Format: Rapidly share critical challenges  Objective: Provide opportunity for initial networking and identification of what the experts believe are the most critical energy issues in the region	Facilitator
<b>9:45 – 10:00</b>	Break	
<b>10:00 – 10:45</b>	Initial Insights on EERE Market Trends and Opportunities in the Lower Mekong	Mr. Dan Bilello, Program Manager, U.S.



	<p>Format: Presentation and Q&amp;A</p> <p>Objective: Update on NREL’s organizational and technical analysis</p>	Department of Energy National Renewable Energy Laboratory
<b>10:45 – 11:45</b>	<p>Surveying the Region: What’s the big picture?</p> <p>Format: Small group structured brainstorming</p> <p>Objective: Gather insight around relationships between key elements of the energy system to frame discussion on barriers/opportunities. Identify drivers that influence investment decisions and energy choices</p>	Facilitator
<b>11:45 – 1:00</b>	Lunch	
<b>1:00 –3:00</b>	<p>Critical Barriers/Opportunities for Clean Energy in the Mekong</p> <p>Format: Structured small group exercise</p> <p>Objective: Identify critical barriers and opportunities to investment in clean energy in the areas of policies, technologies and investment</p>	Facilitator
<b>3:00 – 3:15</b>	Break	
<b>3:15 – 4:00</b>	<p>Critical Barrier/Opportunities for Clean Energy in the Mekong</p> <p>Format: Group Debrief</p> <p>Objective: Review all barriers and opportunities, team votes on critical barriers and opportunities to focus on</p>	
<b>4:00 – 4:30</b>	<p>Core Questions (Time Permitting)</p> <p>Format: Structured small group exercise</p> <p>Objective: Identify critical questions that consider both barriers and opportunities, forms the basis for planning the approach</p>	Facilitator
<b>4:15 – 5:00</b>	<p>Wrap-Up and Summary of Opportunities</p> <p>Format: Large group discussion highlighting major themes from the day</p>	



	Objective: Acknowledge accomplishments from the day and insight contemplation on how best to seize opportunities and overcome barriers discussed. Provide overview of Day 2 agenda.	
--	---	--

**Figure 7: Agenda for Thursday April 23, 2015**

**Friday April 24, 2015**

<b>Time</b>	<b>Topic/Description</b>	<b>Presenter/Lead</b>
<b>8:00 – 8:30</b>	Agenda Review/Accomplishments	Facilitator
<b>8:30 – 9:30</b>	Pathways: Planning the Approach through Mapping	Facilitator
<b>9:30 – 10:30</b>	Status Check/Debrief	Facilitator
<b>10:30 – 11:45</b>	Pathways Continued: Refining the Approach	Facilitator
<b>11:45-1:00</b>	Lunch	
<b>1:00 – 2:30</b>	Pathway Presentations	Facilitator
<b>2:30 – 3:00</b>	Wrap-Up and Summary/Next Steps	Alfred Nakatsuma

**Figure 8: Agenda for Friday April 24, 2015**



**Appendix C – Table Group Landscape Analysis**

<b>Group I</b>	
<b>Institutions</b>	<ul style="list-style-type: none"> <li>• Utilities and regulators hold a large amount of power. Transparency and independence are critical</li> </ul>
<b>Technology</b>	<ul style="list-style-type: none"> <li>• Not addressed</li> </ul>
<b>Policy</b>	<ul style="list-style-type: none"> <li>• Government mandates, subsidies, and harmonization of energy policies across the region</li> <li>• Governmental mandates – what is the government’s support of energy policy? Energy efficiency? Utility transparency?</li> <li>• Little harmonization of policies across the region – country differences, hard to implement solutions with varying country by country policies</li> </ul>
<b>Market/Financial</b>	<ul style="list-style-type: none"> <li>• Energy access</li> <li>• Monopoly vs. competition – utility support or incentive for energy efficiency, reduced energy use</li> <li>• Actual vs. perceived cost of technology – actual costs are coming down, but perceived cost of adopting renewable energy technologies remain high</li> <li>• Electricity tariff schemes – if subsidies exist, it makes it difficult for renewables to be adopted on a large scale</li> </ul>
<b>People</b>	<ul style="list-style-type: none"> <li>• Oppositions/support from populations is important to consider – adoption is more successful when awareness is built and misperceptions are addressed</li> <li>• Societal beliefs and values about energy efficiency and renewable energy</li> <li>• Social opposition/perceptions (perceived health impacts)</li> <li>• Social support               <ul style="list-style-type: none"> <li>○ Grid vs. distributed generation</li> </ul> </li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Fossil Fuels               <ul style="list-style-type: none"> <li>○ Availability</li> <li>○ Scarcity</li> </ul> </li> <li>• Natural gas (e.g., Thailand is highly dependent on natural gas for electricity) – unless renewable energy becomes cost competitive, coal and nuclear are the most likely to be considered</li> <li>• Regional differences</li> </ul>

**Figure 9: Group I Landscape Analysis**

<b>Group 2</b>	
<b>Institutions</b>	<ul style="list-style-type: none"> <li>• Governance – transparency</li> <li>• Capacity</li> <li>• Coordination between regions</li> <li>• Capability</li> <li>• Pathway dependency – an institution can have a historical goal that tends to remain constant over time, without readjustment</li> </ul>
<b>Technology</b>	<ul style="list-style-type: none"> <li>• Appropriate, affordable, with good lifecycle, sourcing for domestic and international sources, scalability</li> </ul>
<b>Policy</b>	<ul style="list-style-type: none"> <li>• Subsidies to EERE provide incentives</li> <li>• Lack of certainty on how policies will play out in future</li> <li>• Ability to enforce</li> <li>• Regulations/regulators (not just of energy sector, but other as well like national human rights organizations)</li> <li>• Fragmentation – across sectors (food, water, energy)</li> </ul>
<b>Market/Financial</b>	<ul style="list-style-type: none"> <li>• Public, private, international financing</li> <li>• Consider regional architecture</li> </ul>
<b>People</b>	<ul style="list-style-type: none"> <li>• Energy efficiency and renewable energy is for people – how affordable is it? Are people aware? Do they have access to power?</li> <li>• Culture is important – does culture support electricity use</li> <li>• Participation of people in making choices about energy</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li>• Energy assessment – how does this play into the overall mix for the country?</li> <li>• Sustainability – links to broader aspects of energy policy development down to the granular level</li> <li>• Sharing – within the country and across the region</li> <li>• Land – needs to be available to make transactions happen</li> </ul>

**Figure 10: Group 2 Landscape Analysis**

<b>Group 3</b>	
<b>Institutions</b>	<ul style="list-style-type: none"> <li>• Not addressed</li> </ul>
<b>Technology</b>	<ul style="list-style-type: none"> <li>• No huge barriers, challenges. There are challenges in modern energy access</li> </ul>

<b>Policy</b>	<ul style="list-style-type: none"> <li>Challenges in policy planning to implementation. Transparency of policy development process. Influence of international policy, strategy, and international environmental policies.</li> </ul>
<b>Market/Financial</b>	<ul style="list-style-type: none"> <li>Pricing, influence of energy prices (wholesale and retail), and its influence on feasibility of energy efficiency.</li> </ul>
<b>People</b>	<ul style="list-style-type: none"> <li>Behavior, growing GDP affects behavior. Capacity available in institutions. Demographics</li> </ul>
<b>Resources</b>	<ul style="list-style-type: none"> <li>Resource endowment throughout the region.</li> <li>Renewable energy resources influence – more developed using the resources of less developed countries.</li> <li>Access to capital/lack of capital. Energy security. Increasing energy demand.</li> </ul>

**Figure 11: Group 3 Landscape Analysis**

<b>Group 4</b>	
<b>Institutions</b>	<ul style="list-style-type: none"> <li>Not addressed</li> </ul>
<b>Technology</b>	<ul style="list-style-type: none"> <li>Not the main issue – policy and political economics are more important. The technology is there.</li> </ul>
<b>Policy</b>	<ul style="list-style-type: none"> <li>Integrated resource planning is critical, but is not being done. Energy efficient appliances vs. power, money, supply, etc. The latter has the power and influences the decisions. [There are] 2 different conversations happening. How do we align?</li> </ul>
<b>Market/Financial</b>	<ul style="list-style-type: none"> <li>Pricing and subsidies are a large issue</li> </ul>
<b>People</b>	<ul style="list-style-type: none"> <li>People and decision making –               <ul style="list-style-type: none"> <li>Vested interest – people do not have a say in where their energy comes from (barriers set up by utilities)</li> <li>Lack of awareness of people’s ability to influence energy use</li> <li>Myanmar – government is subsidizing solar home systems. This is affecting the market (negatively). The government should be guiding this process, not forcing it. Don’t distort the market, guide it.</li> </ul> </li> </ul>



<b>Resources</b>	<ul style="list-style-type: none"><li>• As the grid expands, there are areas still that are off grid. How do these intersect?</li></ul>
------------------	---

**Figure 12: Group 4 Landscape Analysis**





**Appendix D – Table Group Opportunities/Barriers**

Group I	
BARRIERS	OPPORTUNITIES
<ul style="list-style-type: none"> <li>- Limited budget and resources</li> <li>- Large, upfront cost with long payback period</li> </ul>	<ul style="list-style-type: none"> <li>- Capacity building, policy/support/regulations (data collection)</li> <li>- Awareness and capacity building through south-south cooperation</li> <li>- Showcase of best practices</li> </ul>
<p>Ability to identify problems and fix in a set timeframe</p>	<ul style="list-style-type: none"> <li>- EERE can create new, green jobs which may also be an emergent industry itself for some countries</li> </ul>
<ul style="list-style-type: none"> <li>- Energy planning processes sideline EERE (they are not integrated)</li> <li>- Utility monopolies</li> <li>- Closed door electricity planning processes limit the opportunity for progressive actors to shape them</li> <li>- Bureaucracy, dominating decision</li> <li>- Power dynamics – transparency between energy and environment ministries. Energy ministries are not sharing accurate data, so environment ministries cannot identify the true impacts.</li> </ul>	<ul style="list-style-type: none"> <li>- Smart grids, mini-grids, off-grids</li> <li>- New, affordable technologies available to take advantage of</li> <li>- RE technologies now increasingly economically available</li> </ul>
<p>Market Barriers:</p> <ul style="list-style-type: none"> <li>-Relative price and cheap fossil fuels/inefficient mass technologies (trade related)</li> <li>-High tariff rate of some technologies (e.g., wind, industrial efficiency)</li> <li>-Anti-dumping clauses</li> </ul>	<ul style="list-style-type: none"> <li>- At a national level, strong, good policy framework</li> </ul>
<p>Weak institutional capacity</p>	<ul style="list-style-type: none"> <li>- Significant human and natural/renewable resources</li> </ul>



	<ul style="list-style-type: none"> <li>- Existence and knowledge institutes (ERIA, ACE, ASEAN)</li> </ul>
LDCs less willing to pursue energy efficiency in light of limited access to electricity	<ul style="list-style-type: none"> <li>- Improve connectivity/grid</li> <li>- Regional connectivity</li> </ul>
<ul style="list-style-type: none"> <li>- Technological lock-in for centralized systems limit the introduction of EERE (including decentralized technologies)</li> <li>- Commercialization scalability (energy efficiency and small renewable energy commercialization)</li> </ul>	<ul style="list-style-type: none"> <li>- Regional level, ASEAN economic community</li> </ul>
There exist regulatory barriers/an absence of sufficient regulations for introduction of EERE	Identify sources of assistance/expertise and push forward to implementation
<p>Non-market barriers:</p> <ul style="list-style-type: none"> <li>-Environmental impacts on existing eco-system (e.g., hydro)</li> <li>-Regulatory capacity to implement targets</li> </ul>	<ul style="list-style-type: none"> <li>- Growing public support for/international support for low-carbon economics</li> <li>- Energy high on agenda politically for regional integration</li> <li>- Teamwork/team effort at domestic and international level</li> </ul>
Siloed/ad-hoc nature of planning – leading to implementation (weak) gaps	<ul style="list-style-type: none"> <li>- Global level emerging:               <ol style="list-style-type: none"> <li>1. International climate negotiation and funding</li> <li>2. Commitment and sustainable development goals</li> </ol> </li> </ul>
Lack of consistent policy direction	<ul style="list-style-type: none"> <li>- Influx of investment</li> <li>- Support investment by public sector (and Public Private Partnership)</li> </ul>
<ul style="list-style-type: none"> <li>- Market distortion by governments</li> <li>- Policy/regulation/implementation</li> <li>- Lack of incentives to attract private sector participation</li> </ul>	<ul style="list-style-type: none"> <li>- Sources of many options for sustainable energy financing</li> <li>- Growing private sector interests</li> </ul>

**Figure 13: Group I Barriers/Opportunities List**



<b>Group 4</b>	
<b>BARRIERS</b>	<b>OPPORTUNITIES</b>
Lack of informed decision making process	Availability of variety of financing mechanism for clean energy
Lack of integrated, transparent planning and regulation	Technology exists that creates opportunity
Market distortion → Lack of regulations, high tariff rate, limited budget available in national framework	Accelerated cost reductions, availability of technology. Opportunity to introduce incentive in policy
Centralized power planning– same institutions are making decisions, creates structural issues	Cost of clean and renewable energy resources decreasing – wide range of RE technologies available now, will become more affordable over time, and will allow for increased reach
Centralized decision making and provision of energy	Declining cost of RE, increased willingness to pay, large youth population – build capacity of new generation that will be proponents/implementers of new business models
Inadequate energy planning – politics of planning, best practices that have already been tried (or should be) have/have not been adopted. Institutional lock-in has resulted.	New & existing technologies that are available and economically viable.
Pricing structure of energy subsidies, appropriate tariff design	International climate policy and discussions
Limited ability to exit contracts, limiting options.	
Lack of EERE investment and incentives	
Lack of capacity/capabilities to formulate and implement EERE policy	

**Figure 14: Group 4 Barriers/Opportunities List**

**Appendix E: Pathways: Planning the Approach Maps**

Team I Approach

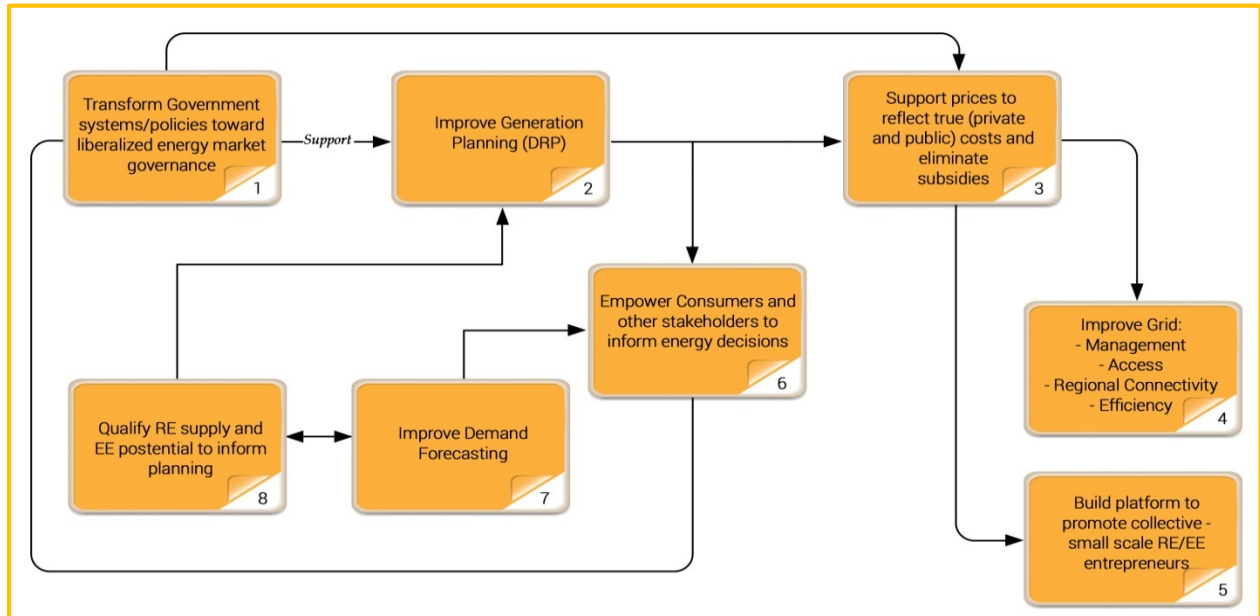


Figure 15: Team I Approach to EERE at Scale

Action	Actor	Capabilities
1. Transform Government systems/policies toward liberalized energy market governance	Ministries Utilities Regulators Donors ASEAN Center for Energy HAPVA: Head of ASEAN	Incentive schemes ASEAN Energy Minister Meeting
2. Improve Generation Planning (DRP)	Unidentified	Closely integrate technical working group findings
3. Support prices to reflect true (private and public) costs and eliminate subsidies	Large-scale investors/ Commercial banks	Influence IMF, World Bank, and ADB
4. Improve Grid: a. Management b. Access	Utilities	Engage private sector



<p>c. Regional Connectivity d. Efficiency</p>		<p>Standardize grid and building codes</p>
<p><b>5.</b> Build platform to promote collective small scale EERE entrepreneurs</p>	<p>Unidentified</p>	<p>Simplify and streamline requirements and procedures Distributed Generation Coordination to achieve bargaining power and access to finances</p>
<p><b>6.</b> Empower consumers and other stakeholders to inform energy decisions</p>	<p>Consumers NGOs Environmental groups Media Champions</p>	<p>Education/Informing Empowerment through data</p>
<p><b>7.</b> Improve demand forecasting</p>	<p>Technical unit International experts/advisors</p>	
<p><b>8.</b> Qualify RE supply and EE potential to inform planning</p>	<p>Unidentified</p>	<p>Create a technical working group/Unit for forecasting power demand and estimating supply</p>

**Figure 16: Team I Actions, Actors and Capabilities to EERE at Scale**

Team 2 Approach

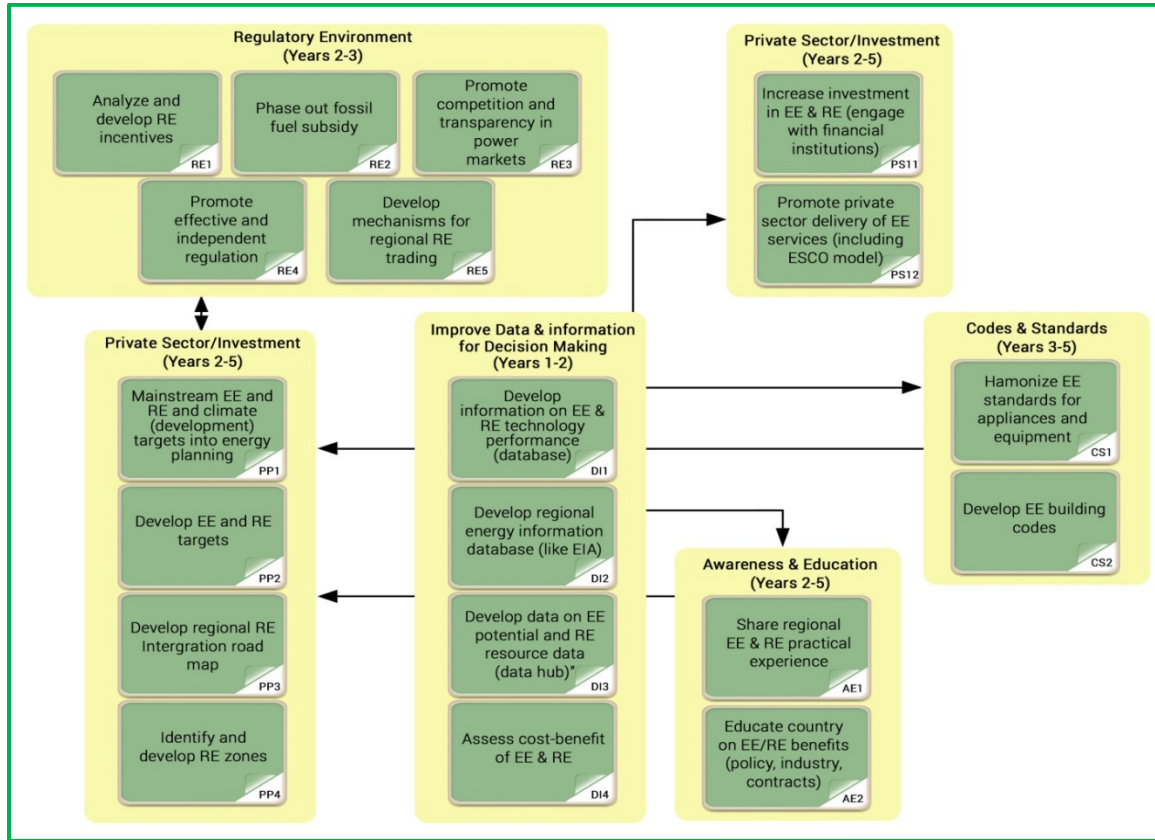


Figure 17: Team 2 Approach to EERE at Scale

Action	Actor	Capabilities
1. DI1 - Develop information on EE and RE technology performance (database)	Ministry of Energy Knowledge Institutions Industry Associations Communities/NGOs Development Partners Regional Bodies Ministry of Science and Technology National Statistics Office	Testing, technology verification Gather official statistics
2. DI2 - Develop a regional energy information database (like EIA)	Regional Bodies	Consultation acceptance



	Ministry of Science and Technology Regulators Utilities Knowledge Institutes Energy Minister	Service Provision
3. DI3- Develop data on EERE potential/ resource data (data hub)	Ministry of Science and Technology Ministry of Energy Knowledge Institutions Industry Associations Private Sector Developers Sub-National Governments Communities/NGOs	
4. DI4 - Assess co-benefits of EERE	Ministry of Energy Ministry of Natural Resources and Environment National Statistics Office Knowledge Institutions Ministry of Labor Ministry of Social Welfare/Development	Employment data Employment targets
5. REI - Analyze and develop renewable energy incentives	Ministry of Energy Knowledge Institutions Regulators	Budget allocation, fiscal approver Stakeholder input





	Ministry of Finance, Private Sector Developers	
6. RE2 - Phase out fossil fuel subsidy	Public Communities/NGOs Industry Associations Ministry of Energy Ministry of Finance Regulators Utilities	Consultation acceptance Service Provision
7. RE3 - Promote competition and transparency in power markets AND 8. RE4 - Promote effective and independent regulation	Communities/NGOs Industry Associations Ministry of Energy Regulators Utilities Prime Minister Judiciary Media	Make ruling Spotlight issue, raise awareness
9. RE5 - Develop mechanism for regional RE trading (guidelines, transmission infrastructure, etc.)	Regulators Regional bodies Ministry of Energy Utilities Private Sector/ Developers Knowledge Institutes Development partners System Operators Ministry of Foreign Affairs	Cross-border agreements



<p>10. PPI - Mainstream the EERE and climate (development) targets into energy planning</p>	<p>Prime Minister National Planning Agency Ministry of Energy Ministry of Natural Resources and Environment Industry Associations Knowledge Institutions Development Partners</p>	<p>Guidance/plans Advocacy Analysis Funding Technical Assistance International BP</p>
<p>11. PP2 - Help countries develop EE/RE targets</p>	<p>Ministry of Energy Knowledge Institutions Industry Associations Regulator</p>	<p>Enact regulations</p>
<p>12. PP3 - Develop regional renewable energy roadmap</p>	<p>Regional Bodies (ASEAN Center for Energy, GMS Regional Power Trade Coordination Committee, ASEAN Business Council etc.) Ministry of Energy Knowledge Institutions Development Partners Regulator</p>	<p>Regional cooperation, coordination, consultation</p>
<p>13. PP4 - Identify and develop RE zones</p>	<p>Ministry of Energy Knowledge Institutions Development Partners National Planning Agency Industry Associations Sub-national governments</p>	<p>Zoning, land use</p>



	Communities/NGOs	
14. AEI - Share regional experiences on EERE development	Knowledge Institutions Ministry of Energy Industry Association. Sub-National governments Communities/NGOs Regional Bodies Media	
15. AE2 - Educate the country on EERE benefits (policy, industry, consumers)	Ministry of Education Public relations/ advertising agencies Ministry of Energy Knowledge Institutions Industry Associations Parliaments	Disseminate Create Campaigns Legislation
16. PSI - Promote private sector delivery of energy efficiency services (i.e., ESCO model)	Banks/Financial Institutions Board of Investment Ministry of Finance Private Sector/Developers Regulator Utilities Ministry of Energy	Lending/investment Tax initiatives/investment privileges
17. CSI – Develop energy efficiency building codes	Regional Bodies Industry Associations	Set safety standards Perform studies (?)

	<p>Ministry of Energy</p> <p>Knowledge Institutions</p> <p>EE Equipment Providers</p> <p>Testing Laboratories</p> <p>National institutes of standards</p>	
<p>18. CS2 – Harmonize energy efficiency standards for appliances and equipment</p>	<p>Public works</p> <p>Ministry of Construction</p> <p>Knowledge Institutions</p> <p>Industry Associations</p> <p>Sub-National governments</p> <p>Communities/NGOs</p> <p>Testing Laboratories</p>	<p>Inspections</p> <p>Construction Standards</p> <p>Test Equipment Performance</p>
<p>19. PS2 - Increase investment in EERE (engage with financial institutions)</p>	<p>ESCO</p> <p>Utilities</p> <p>System Operators</p> <p>Regulator</p> <p>Ministry of Energy</p> <p>Private Sector/Public Developers</p> <p>Energy efficiency Equipment Providers</p>	<p>Energy efficiency Services</p>

**Figure 18: Team 2 Actions, Actors and Capabilities to EERE at Scale**

Team 3 Approach

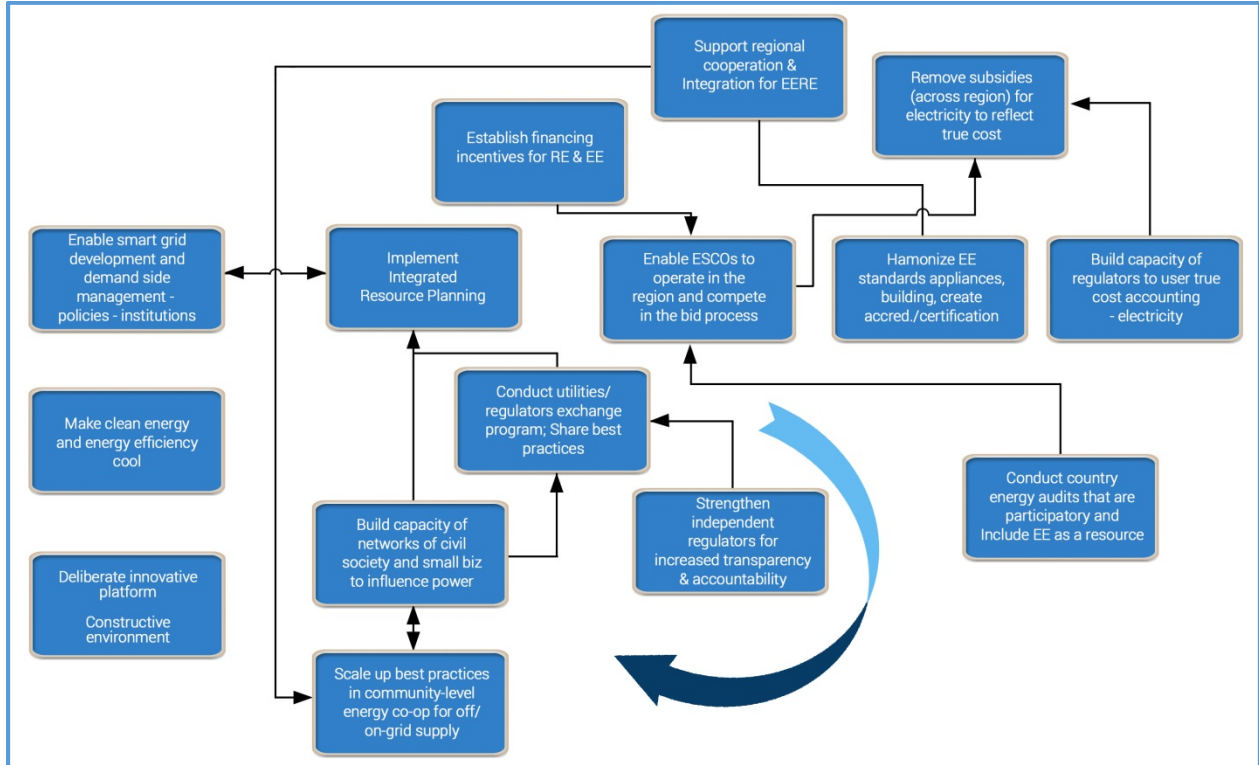


Figure 19: Team 3 Approach to EERE at Scale

Action	Actor	Capabilities
1. Support regional cooperation & integration for EERE	National GMS Coordinators	
2. Harmonize energy efficiency standards for appliances, buildings; create accreditation/ certification bodies	ASEAN National ministries	
3. Scale up best practices in community-level energy cooperative groups for off/on-grid supply	Local communities/NGOs	
4. Build capacity of networks of civil society and small businesses to influence power policies	Civil society groups other donors' supported projects (e.g. Mekong Partnership for the Environment)	For Energy Planning Reform



<p><b>5.</b> Conduct utilities/ regulators exchange program; Share best practices</p>	<p>Through creation of Deliberative Innovation Platform</p>	
<p><b>6.</b> Strengthen independent regulators for increased transparency &amp; accountability</p>	<p>Policy makers Entrepreneurs Media Civil Society Consumer Associations</p>	
<p><b>7.</b> Implement Integrated Resource Planning</p>	<p>Policy makers Entrepreneurs Media Civil Society Consumer Associations (Myanmar National Energy Management Committee Members)</p>	
<p><b>8.</b> Enable smart grid development and demand side management – policies - institutions</p>		
<p><b>9.</b> IA. Establish financing incentives for EERE</p>	<p>ASEAN Center for Energy Multilateral Development Banks Commercial Banks National ministries</p>	
<p><b>10.</b> IB. Conduct country energy audits that are participatory and include EE as a resource</p>		



<b>I1. 2A.</b> Enable ESCOs to operate in the region and compete in the bid process	National ministries Utilities	Not visible in Myanmar; One stop shop for business; Policy framework for EERE
<b>I2. 2B.</b> Build capacity of regulators to user true cost accounting - electricity	National energy planning commissions	Disclose Assumptions; Improve EIA/SEA Statistics; Cross-ministry implementation
<b>I3. 3.</b> Remove subsidies (across region) for electricity to reflect true cost	Ministry of Finance Civil Society's Voice	

**Figure 20: Team 3 Actions, Actors and Capabilities to EERE at Scale**