

Rural electrification on ASEAN Energy Blueprint: ASEAN Energy Plan of Action for Energy Cooperation (APAEC) 2016-2025

Dr. Tharinya Supasa

Senior Energy Analyst, ASEAN-German Energy Programme (AGEP)

Septia Buntara

Acting Manager, ASEAN-German Energy Programme (AGEP)

ASEAN Centre for Energy

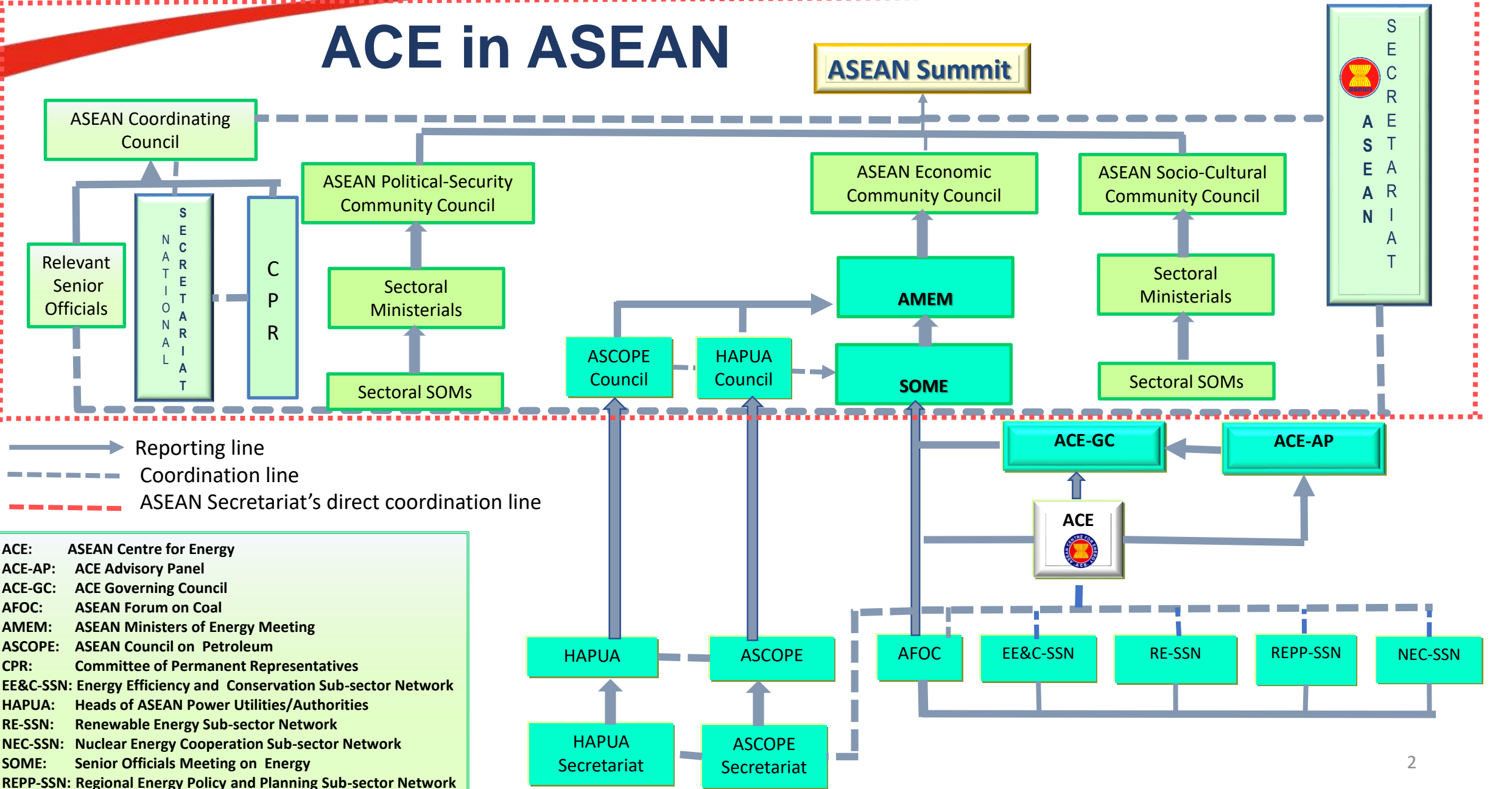
The mini-workshop on rural electrification research in JASTIP-net

2nd February 2019



**One Community
for Sustainable
Energy**

ACE in ASEAN



ASEAN Centre for ENERGY at a glance

Enhanced ACE

ACE Vision & Mission

Think Tank

Identifying and
surfacing innovative
solutions

policies, legal &
regulatory frameworks
and technologies

Energy Data and Knowledge Hub

Provide a knowledge
depository for AMS

Policy and
Research Analytics
(PRA)

Energy
database

Catalyst

Unify and strengthen
ASEAN Energy Cooperation
and Integration

APAEC activities,
including with
DPs/IOs

Secretariat

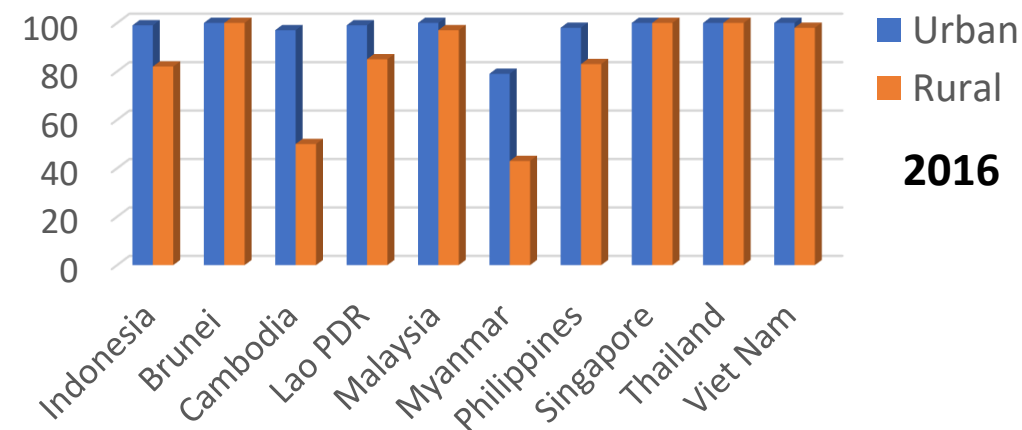
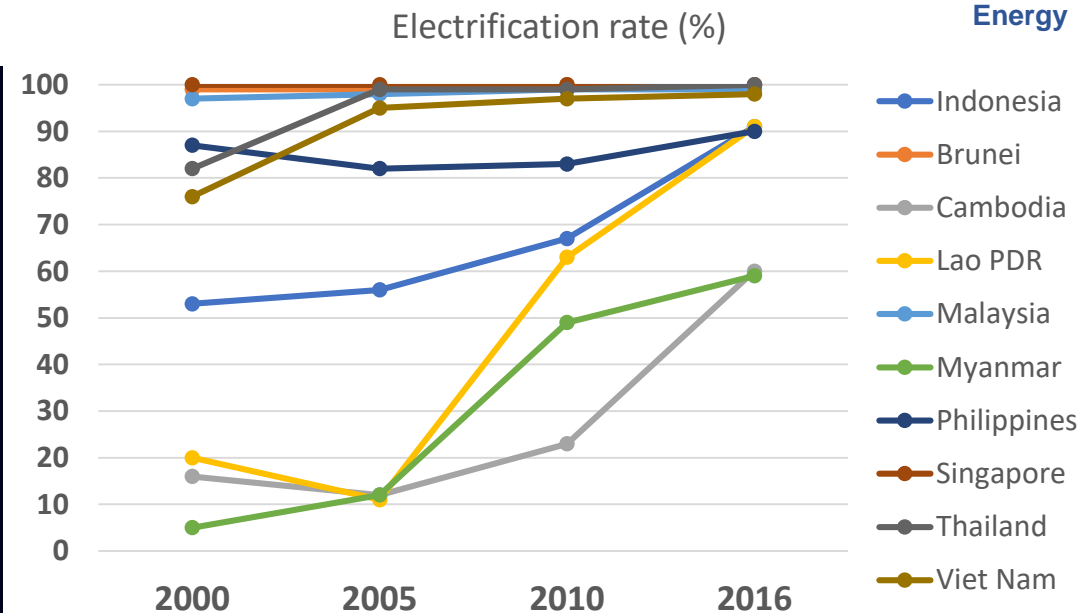
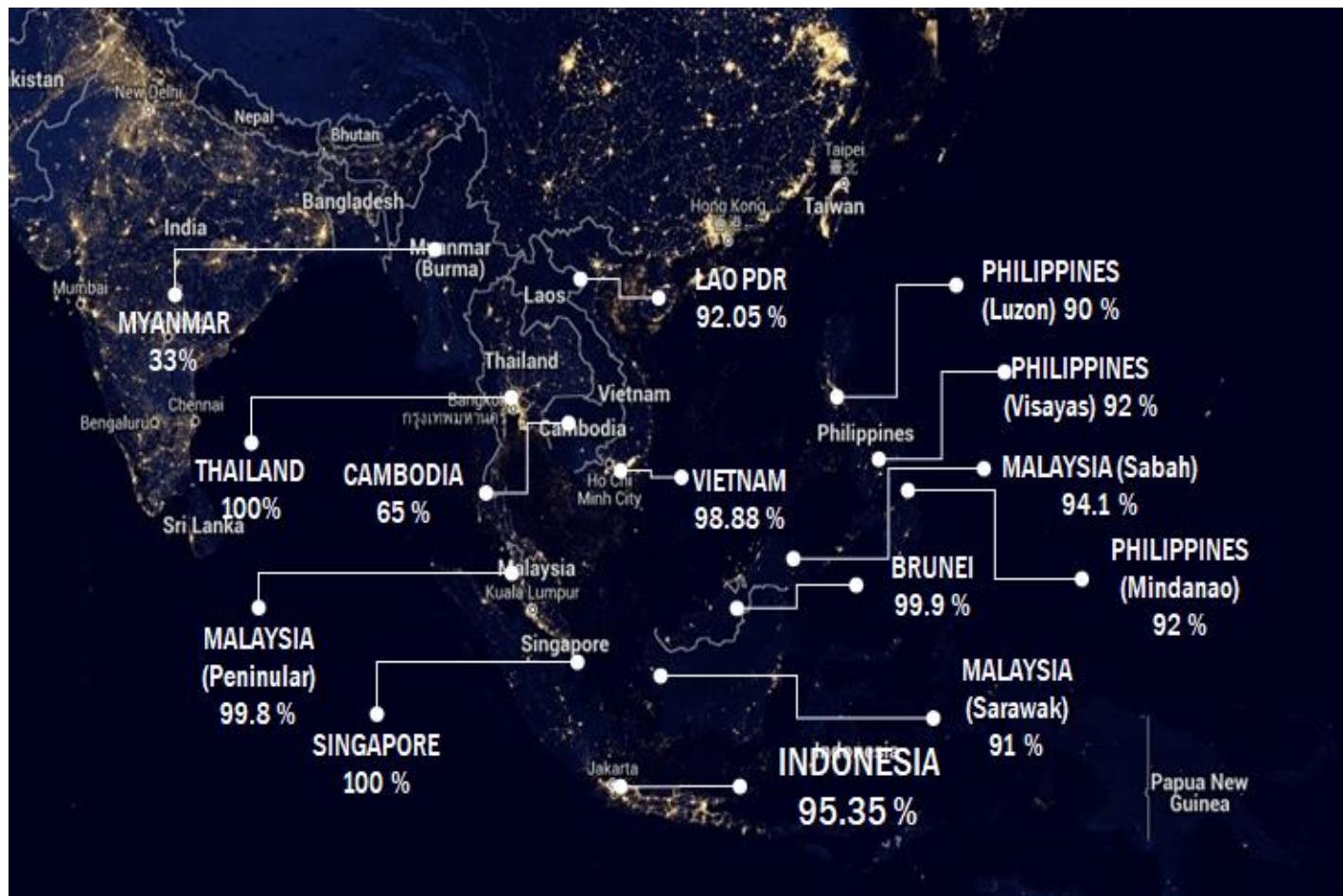
Research, publication, training, capacity building, workshop, policy exchange and recommendations, etc.

ACE as an organisation

Sustainable Management

Good Governance

ASEAN – Access to electricity(%)

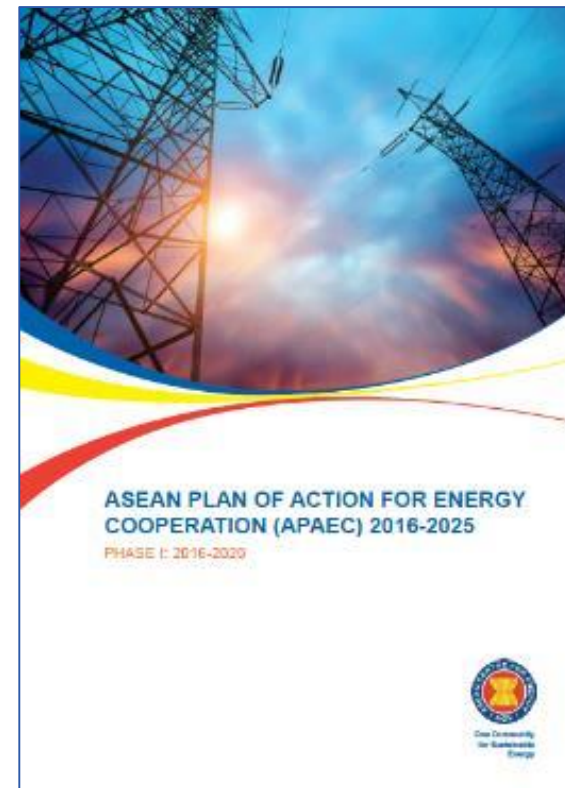


In 2017, around 60 million are NOT electrified

Overview of ASEAN Plan of Action For Energy Cooperation (APAEC) 2016-2025

“Enhancing Energy Connectivity and Market Integration in ASEAN to Achieve Energy Security, Accessibility, Affordability and Sustainability for All”.

<http://www.aseanenergy.org/resources/publications>

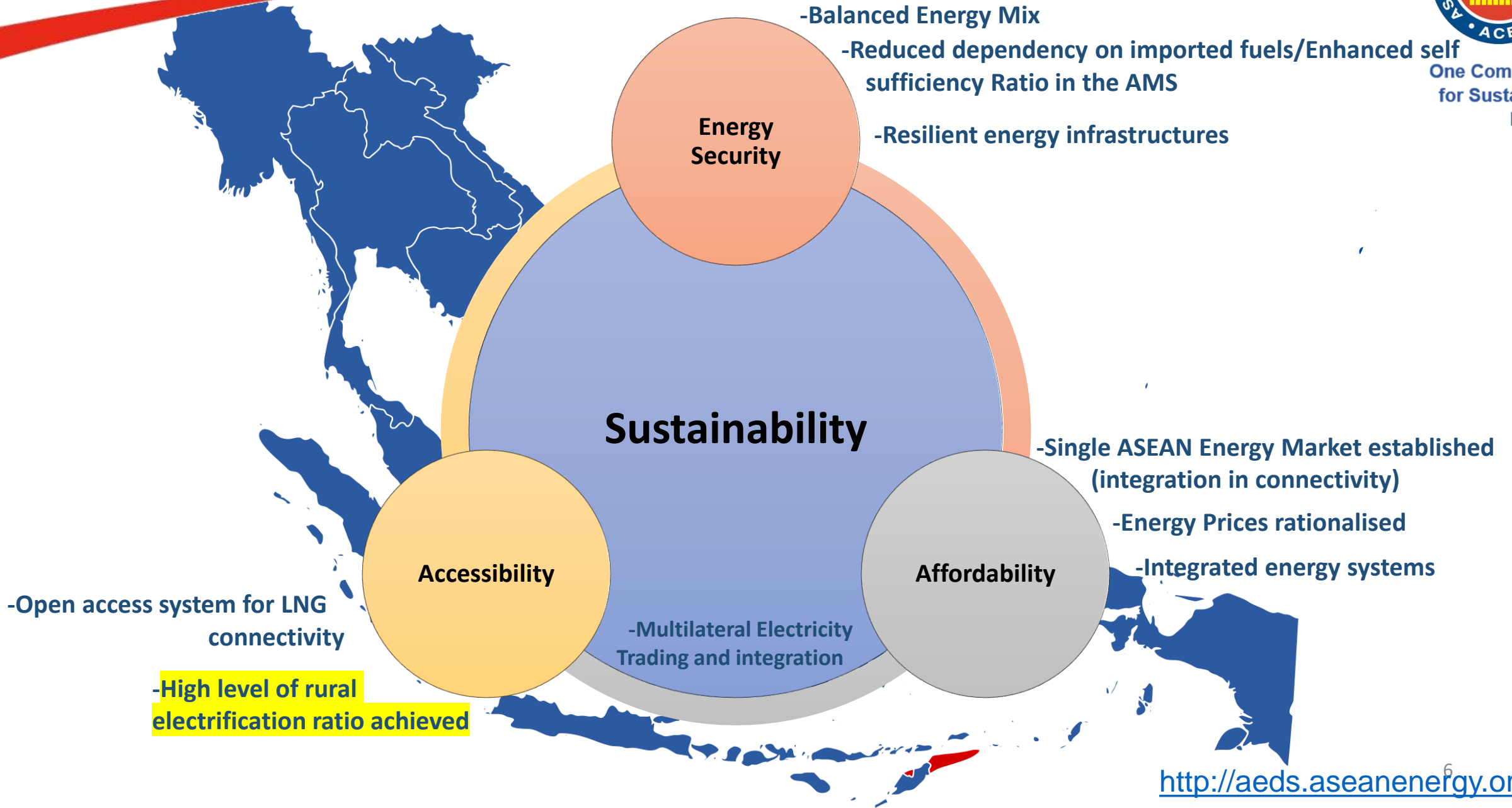


One Community
for Sustainable
Energy

Strategic Directions towards 2025



One Community
for Sustainable
Energy



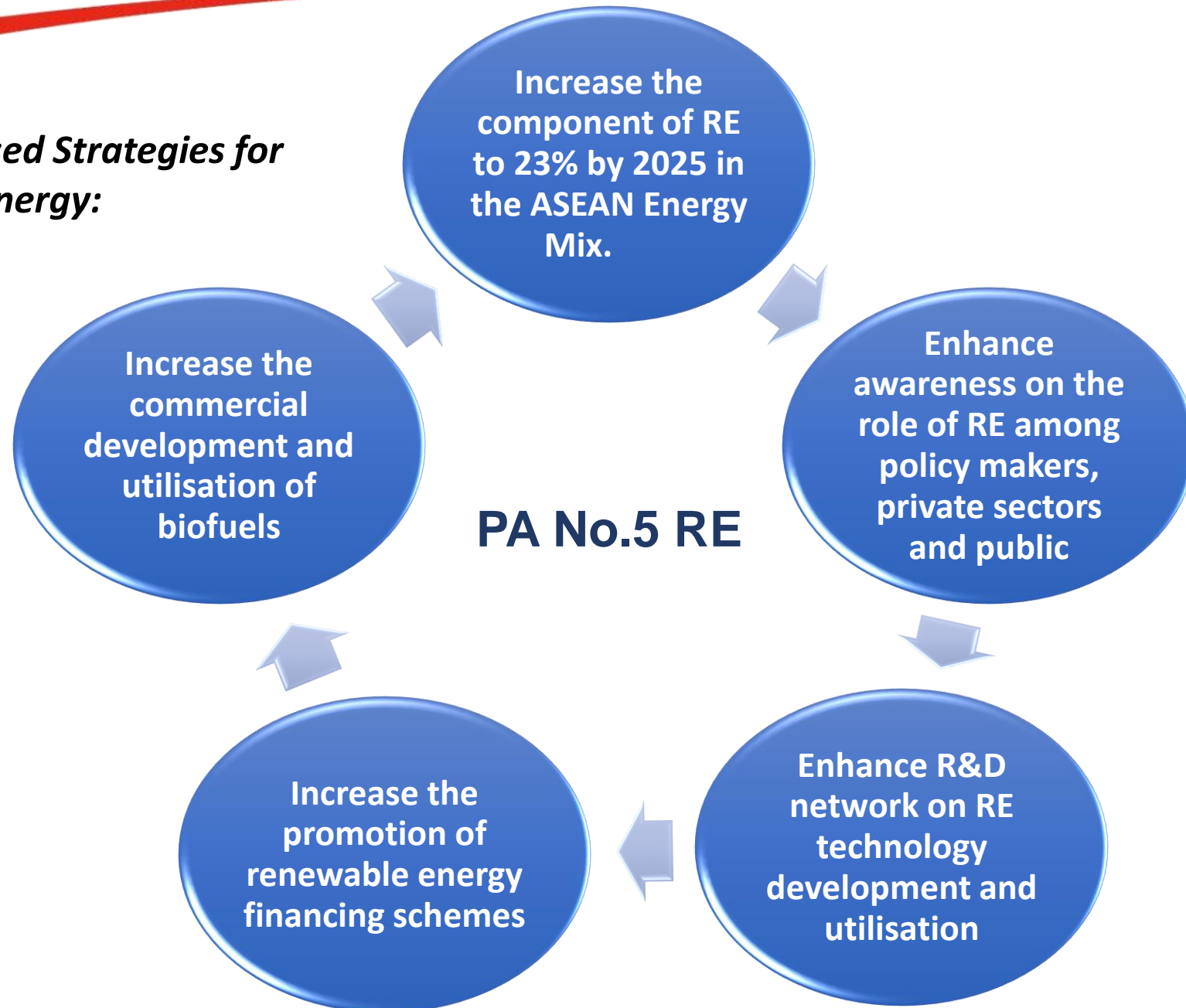


One Community
for Sustainable
Energy

The Seven Programme Areas of APAEC & Key Strategies

| | |
|--|---|
| 1. ASEAN Power Grid | To initiate multilateral electricity trade in at least one sub-region by 2018. |
| 2. Trans ASEAN Gas Pipeline | To enhance connectivity for energy security and accessibility via pipelines and regasification terminals. |
| 3. Coal & Clean Coal Technology | To enhance the image of coal through promotion of clean coal technologies (CCT). |
| 4. Energy Efficiency & Conservation | To reduce energy intensity by 20% in 2020 based on 2005 level. |
| 5. Renewable Energy | Aspirational target to increase the component of renewable energy to 23% by 2025 in ASEAN Energy Mix. |
| 6. Regional Energy Policy and Planning | To better profile the energy sector internationally. |
| 7. Civilian Nuclear Energy | To build capabilities in policy, technology and regulatory aspects of nuclear energy. |

***Outcome-based Strategies for
Renewable Energy:***





One Community
for Sustainable
Energy

Attachment: Renewable Energy Action Items

Outcome-based Strategy 1: Aspirational target to increase the component of RE to 23% by 2025 in the ASEAN Energy Mix.

- a. To enhance and implement RE policy and targets.
- b. Develop and adopt ASEAN RE Roadmap by 2020.
- c. Monitor RE capacity additions/deployment of the AMS on an annual basis.

Outcome-based Strategy 2: Enhance awareness on the role of renewable energy among policy makers, private sectors and public.

- a. Develop a nodal network
- b. Develop an RE-hub information sharing mechanism among AMS
- c. Conduct at least two (2) high level policy dialogues.
- d. Conduct annual technical training on renewable energy.



One Community
for Sustainable
Energy

Outcome-based Strategy 3: Enhance R&D network on RE technology development and utilisation within the region.

a. Establish a nodal network with at least minimum two (2) research institutions or universities to promote cooperation, technology development, sharing of research facilities and exchange and mobility of researchers on renewable by 2020.

Outcome-based Strategy 4: Increase the promotion of renewable energy financing schemes.

- a. Establish a nodal network with at least two (2) national / regional / international financial institutions for renewable energy financing.
- b. Develop a guideline of RE Support Mechanism for Bankable Projects.
- c. Conduct regular training on renewable energy financing.

Outcome-based Strategy 5: Increase the commercial development and utilisation of biofuels with a reference standard to facilitate deployment.

- a. Develop a nodal network with automotive and related industries on technological know-how and R&D activities for biofuel.
- b. Conduct market studies to fully determine the commercial potential of bioenergy.

The rural electrification research under JASTIP contributes to achievement of outcome-based strategy 1 and 3 of APAEC Programme Areas for RE.

Efforts in AMS: Policies

| Country | RE Target |
|-------------|--|
| Brunei | 10% RE share in Power Generation by 2035* |
| Cambodia | More than 2 GW of hydropower by 2020 |
| Indonesia | 23% NRE share in energy mix in 2025 |
| Lao PDR | 30% RE share of total energy consumptions by 2025 |
| Malaysia | 20% RE share by 2030* |
| Myanmar | 15% - 20% RE share in installed capacity by 2030* |
| Philippines | 15 GW installed capacity in 2030 |
| Singapore | 350 MW installed capacity of solar by 2020 |
| Thailand | 30% AE share in total energy consumption by 2036* |
| Vietnam | 27 GW RE installation in 2030* |

*exclude large hydro

Efforts in AMS: The Project Stories

50-MW Large Scale Solar (LSS) Malaysia



- Background

- 20% renewable power target for 2030

Project

- 50-MW Large Scale Solar (LSS) park in Selangor state
- The largest PV plant in the country uses 230,000 solar panels installed on 98 hectares (242.2 acres).

Status

- To reach full capacity before the end of the year.

Efforts in AMS: The Project Stories

Eastern Indonesia Renewable Energy Project



- Background
 - Large, growing economy with rapidly-growing electricity demand
 - Large fossil fuel producer and consumer
 - Limited land availability
- Project
 - 72MW wind in place, 42MW solar development underway
 - Canadian and ADB funding
 - \$0.10/kWh PPA
- Status
 - Tolo I nearing completion, solar moving ahead
 - Additional wind and solar projects in pipeline

Efforts in AMS: The Project Stories

Viet Nam – Bac Lieu Near-Shore Wind Farm



- Background
 - Densely-populated, less-developed fast growing economy
 - Limited conventional resources
 - Some areas with excellent wind potential
- Project
 - Innovative near-shore wind farm
 - 99 MW, 300 MWh, \$260 million, special \$0.10/kWh tariff
 - First project funded under US – Viet Nam private sector agreement
- Status
 - Operation per plan, tourist attraction
 - 142 MW expansion, other wind farms planned

Efforts in AMS: The Project Stories

The Philippines – Nabas I Wind Power Project



- Background
 - Large, densely population, fast growing
 - Limited conventional resources, good wind resources
- Project
 - Conventional wind farm
 - 36 MW, 100 GWh, \$90 million, \$0.14/kWh tariff
 - Philippine developer and lender
- Status
 - Operation per plan, 250 GWh generation achieved in January 2018
 - New investment by Thailand company (BCPG)
 - Government permission for Nabas 2 obtained

Efforts in AMS: The Project Stories

10 MW Solar PV Plant, Bavet City



- Background
 - Solar resource appears to be at its maximum in several locations (e.g. Phnom Penh, East Siem Reap, Bavet, Battambang, Kampong Chhnang, etc.)
- Project
 - Solar PV 10 MW, \$9.6 million, \$0.91/kWh tariff
 - Consortium of Sunseap Group and SchneiTec
- Status
 - First utility scale solar power plant in Cambodia
 - First competitively tendered renewable energy IPP project in Cambodia
 - Competitive tariff (below average supply cost for EDC) without FIT or any other government subsidy, evidencing solar power's grid parity
 - Tender attracted interest from developers based in
 - Thailand, France and Singapore

Efforts in AMS: The Project Stories

And many more !



SP Group launched a blockchain-powered renewable energy certificate (REC marketplace, - a press release Monday, Oct. 29.

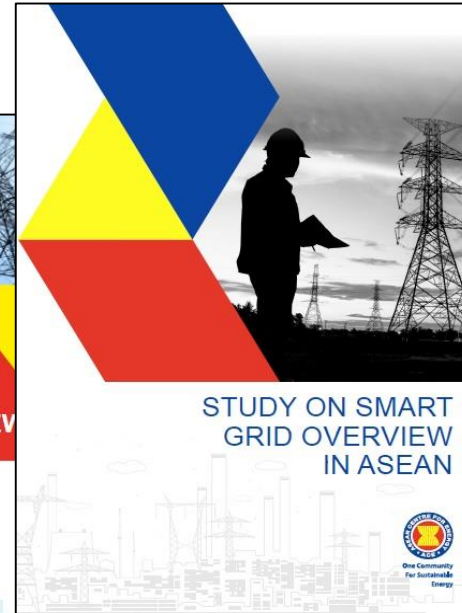
600-MW Monsoon wind project in southern Laos,
planning in 2019



Planning on 40 MW of solar arrays atop manufacturing plants, thus embarking on the biggest rooftop project in Thailand.

Efforts in AMS: RE Programme

Publication



Information Dissemination



Capacity Building



Awards

Challenges

Technical Issues

- Unavailable of data for preliminary assessment
- Have knowledge, but still lack **of know-how** in the project development
- Information exists, but lack of practical knowledge in project development
- Skill and reliability of technical consultant who develop the project
- Locating the grid connection point,
- Distance & compatibility of grids to be connected to RE source
- Scale or size of the project does matter in terms of development costs and land acquisition
- Abundant independent RE Generation - Towards blockchain (?)

Decisive factors :

- Government's long-term commitment to RE power
- Reliable and predictable RE policy and regulatory measures
- Establishing local supply chain
- Access to financing (perception of high risk)

Non-Technical Issues

- Complex and time-consuming procedures
- Difficult to get external financing
- Feasibility study is not bankable
- Lack of reference RE projects
- Reliable supply of the fuel (e.g. biomass or biogas power plant)
- Bad previous experiences with failed RE project / bad track record
- Necessary document cannot be provided in the early phase
- Power utility has a final decision (go-no go for RE project)
- Environmental issues, etc

ASEAN-German Energy Programme (AGEP)



Implemented by:
giz Deutsche Gesellschaft
für Internationale
Zusammenarbeit (GIZ) GmbH



AGEP is jointly implemented by ASEAN Centre for Energy and Deutsche Gesellschaft für International Zusammenarbeit (GIZ) GmbH

Objective: Promote regional cooperation and deployment of Renewable Energy and Energy Efficiency & Conservation in ASEAN Funded by: German Federal Ministry for Economic Cooperation and Development (BMZ)

Project duration: November 2016 – June 2019

In line with ASEAN Plan of Action for Energy Cooperation (2016–2025):

- Programme Area No. 4: Energy Efficiency and Conservation
- Programme Area No. 5: Renewable Energy



Follow our news:

www.agep.aseanenergy.org

[Facebook.com/SustainableEnergyforASEAN](https://www.facebook.com/SustainableEnergyforASEAN)

I. AGEP Activities



Implemented by:
giz Deutsche Gesellschaft
für Internationale
Zusammenarbeit (GIZ) GmbH



| No. | Activities |
|--|---|
| Renewable Energy (RE) | |
| RE-1 | Enhancing the RE policies in ASEAN |
| RE-2 | Promote benefits of RE and EE&C to decision makers and general public |
| RE-3 | Support the development of RE project financing |
| RE-4 | Empower the ASEAN R&D network on RE |
| RE-5 | Exchange on variable Renewable Energy (vRE) grid-integration |
| RE-6 | Study 5 th ASEAN Energy Outlook (AEO5) |
| Energy Efficiency (EE) | |
| EE-1 | Develop financial support mechanism for sustainable EE&C implementation |
| EE-2 | Develop regional Green Building Code for new and retrofitted buildings |
| Organisational Development of ACE | |



One Community
for Sustainable
Energy

On-going Activities, & Publications on RE

- Levelised Cost of Electricity (LCOE) of Various Renewable Energy Technologies in ASEAN (February, 2019)
- Mapping RE R&D in ASEAN (April, 2019)
- RE Financing for CLMV (April 2019)
- RE Dissemination on Youth Video Competition (April 2019)
- The 6th ASEAN Energy Outlook (2020)

Thank you



ASEAN Centre for Energy

One Community for Sustainable Energy

To know more about the latest ACE Publications, those are available for download from <http://www.aseanenergy.org/resources/publications>

For further information or to provide feedback, please contact ACE at secretariat@aseanenergy.org



www.aseanenergy.org



www.linkedin.com/company/asean-centre-for-energy



www.facebook.com/aseanenergy



www.twitter.com/ASEAN_Energy

Relevance to APAEC 2016-2025:

Programme Area No. 5, Outcome-based Strategy 1: Aspirational target to increase the component of RE to 23% by 2025 in the ASEAN Energy Mix

Study on Enabling the Renewable Energy Revolution:
**Insurance and Guarantee Schemes
in ASEAN Member States**



Study on Enabling the Renewable Energy Revolution: Insurance and Guarantee Schemes in ASEAN Member States

Key takeaways:

1. 22 insurance providers (3 Multilateral/Bilateral Financial Institutions, 12 international insurance companies, 7 Export Credit Agencies/ECAs) cover the ASEAN region with 10 different insurance products for RE project
2. 26 guarantee providers (10 Multilateral/Bilateral Financial Institutions, 5 Domestic Financial Institutions, 4 international insurance companies, 7 ECAs) cover the ASEAN region with 9 different guarantee products for RE project

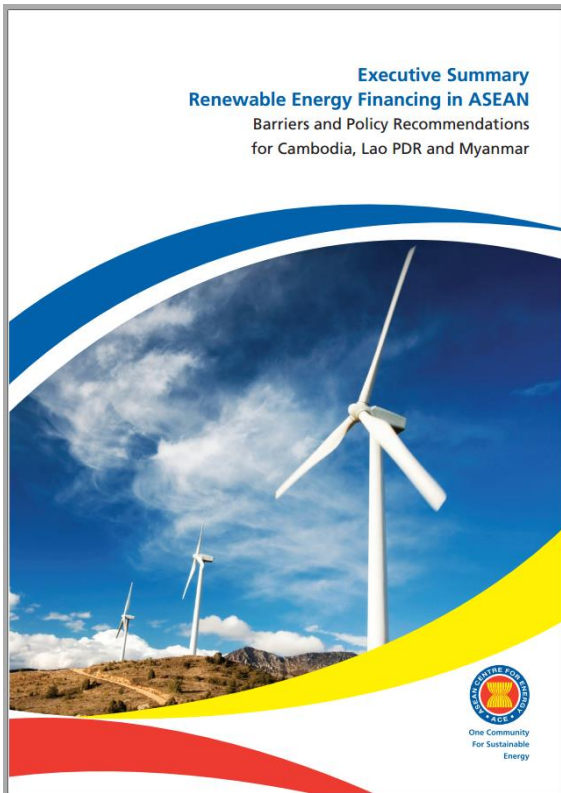
Relevance to APAEC 2016-2025:

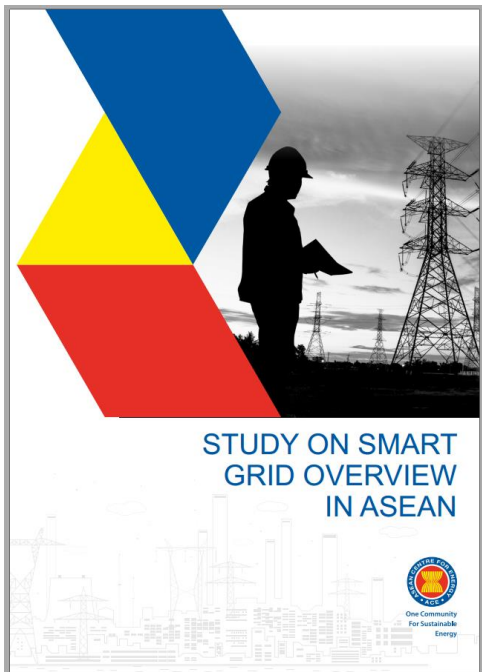
Programme Area No. 5, Outcome-based Strategy 1: Aspirational target to increase the component of RE to 23% by 2025 in the ASEAN Energy Mix

Renewable Energy Financing in ASEAN: Barriers and Policy Recommendations for Cambodia, Lao PDR and Myanmar

Key takeaways:

1. Key barriers for RE project development in CLM are high financing cost and limited access to funding, limited number of potential off-takers, RE seen as competition for fossil-fuel industry, and cumbersome & intricate permitting process
2. Recommendations are provision of credit lines from Multilateral, Bilateral or national development finance institutions, allowing on-site sale of electricity and wheeling, build know-how on grid integration and grid absorption capacity, streamline processes for permit and develop one-stop-permit service

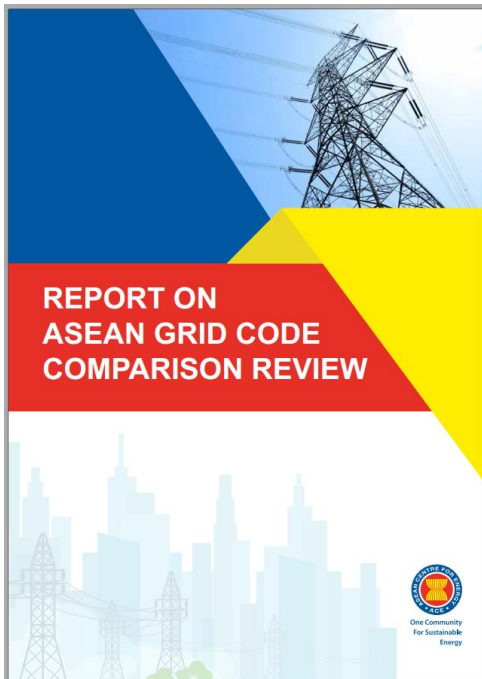




Study on Smart Grid Overview in ASEAN

Key takeaways:

1. Seven AMS (LA, ID, MY, PH, SG, TH and VN) have started/already developed smart grid roadmap.
2. Key barriers: little knowledge on RE intermittency management, limited grid capacities, obsolete communication infrastructure, and cyber security
3. Recommendations: establish a Smart Grid Forum within AMS, set an RE forecast centre, integrate with other infrastructures (EVs, storage, EMS), develop interoperability communication & security standards, and upgrade the network protection infrastructure.



Report on ASEAN Grid Code Comparison Review

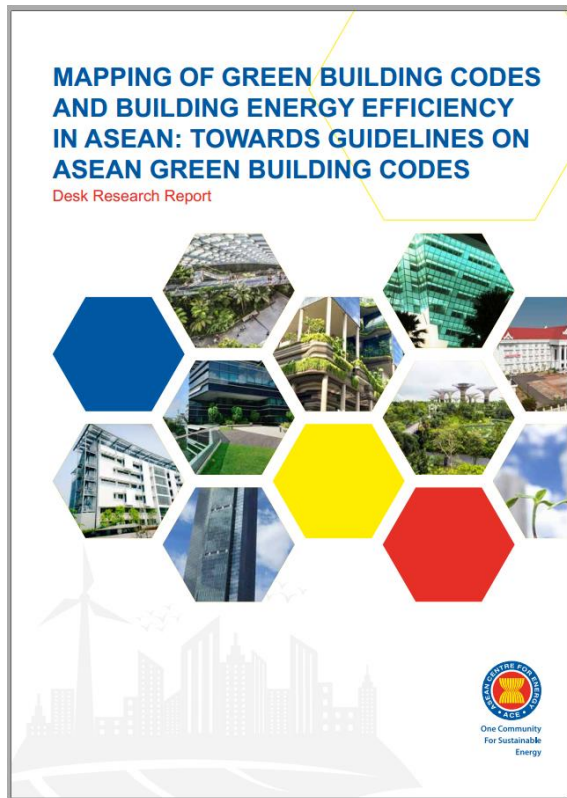
Key takeaways:

1. Seven AMS (CA, ID, MY, PH, SG, TH and VN) have already developed grid codes and/or interconnection standards.
2. Key barriers: Different grid code framework among AMS (even one AMS can have multiple codes).
3. Recommendations: Set up an ASEAN grid code committee as a platform to share experience and knowledge for initiating grid codes harmonization.

**** related to Programme Are No. 1, Outcome-based Strategy 2: Initiate multilateral electricity trading**

Relevance to APAEC 2016-2025:

Programme Area No. 4, Outcome-based Strategy 3: Developing green building codes which support the use of high EE products



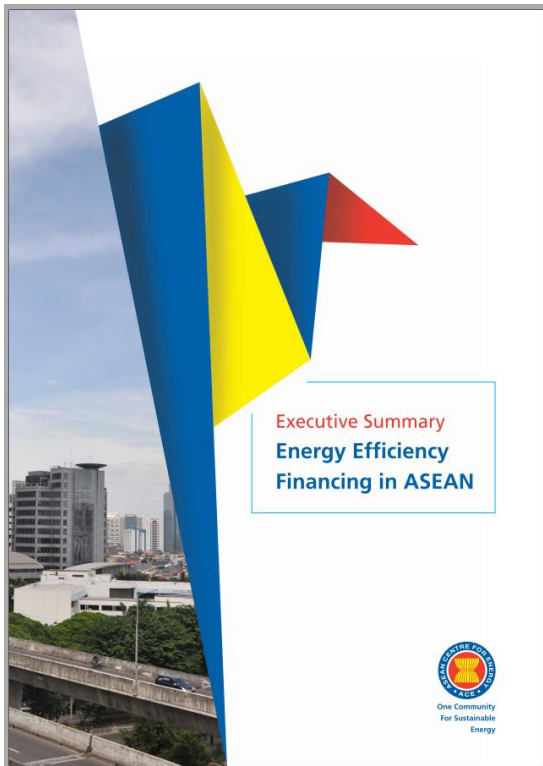
Report on Mapping of Green Building Code and Building Energy Efficiency in ASEAN: Towards Guidelines on ASEAN Green Building Codes

Key takeaways:

1. 4 AMS have schemes/mandatory implementation of EE in government buildings. 7 AMS have developed Green Building Codes and implemented on voluntary/mandatory basis.
2. Some of the key policy challenges are coordination between various stakeholders, limited availability of supporting policies, building energy codes and standards.
3. Some of the key technical challenges are data availability, limited awareness and MRV on EE measures and its impact.

Relevance to APAEC 2016-2025:

Programme Area No. 4, Outcome-based Strategy 3: Developing green building codes which support the use of high EE products



Energy Efficiency Financing in ASEAN

Key takeaways:

1. All 10 AMS have adopted EE&C policies and roadmaps for energy savings, while some of them have been more advanced in creating dedicated financing schemes.
2. Key barriers for the EE development are the limited availability of financing support mechanisms along with its complete and updated information.
3. Recommendations include introducing innovative financing instruments, more active participation from the private sector, and regular stakeholders consultation on updated information.