



AGEDP



ASEAN-German Energy Programme

Mapping of Green Building Codes and Building Energy Efficiency in ASEAN: Towards guidelines on ASEAN Green Building Codes

ASEAN-German Energy Programme (AGEDP) | Singapore, July 16th 2019



Implemented by:

giz Deutsche Gesellschaft
für Internationale
Zusammenarbeit (GIZ) GmbH



Presentation Outline

- ASEAN-German Energy Programme (AGEP)
- Report Findings on Mapping of Green Building Code and Building Energy Efficiency in ASEAN: Towards Guidelines on ASEAN Green Building Codes
- Green Building Code – Report Dissemination Workshop



ASEAN-German Energy Programme (AGEP)

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

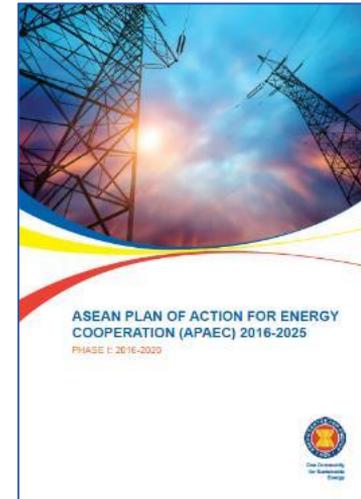
Objective: Promote regional cooperation and deployment of Renewable Energy and Energy Efficiency & Conservation in ASEAN

Funded by: Federal Ministry for Economic Cooperation and Development (BMZ), Germany

Project duration: November 2016 – June 2019

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

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



ASEAN-German Energy Programme (AGEP) I

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	



ASEAN-German Energy Programme (AGEP) II

Objective: Strengthening ACE in its role as a regional centre of excellence for sustainable energy, in the long term June 2022

Project duration: July 2019 – June 2022

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

- Programme Area No. 4: Energy Efficiency and Conservation
- Programme Area No. 5: Renewable Energy
- Programme Area No. 6: Regional Energy Policy and Planning

No	Area	Activities
A	Sustainable Energy	A.1. Develop The 6 th ASEAN Energy Outlook (AEO6) Multi-Stakeholder Partnership Activity on RE and EE: A.2. Develop Nodal Network Framework on RE (R&D) A.3. Develop Regional Workshop on EE Financing, Insurance, and Guarantee
B	Data Management	B.1. Develop Internal Guideline and Competencies on Data Processing B.2. Develop External Statistical Guideline and Competencies on Energy Pricing
C	Organisational Development of ACE	C.1. Develop Business Plan for ACE C.2. Conduct ACE Capacity Building

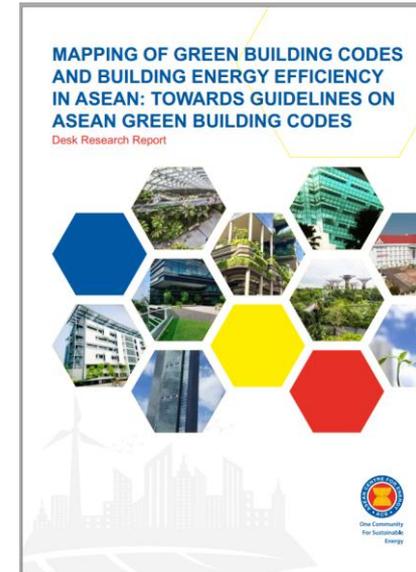


Mapping of Green Building Codes and Building Energy Efficiency in ASEAN: Towards guidelines on ASEAN Green Building Codes

Report was launched during Singapore International Energy Week (SIEW) Roundtable, 1 November 2018

Key findings:

- I. EE Targets
- II. Stakeholders
- III. Strategic Plan and Policy
- IV. Green Building Codes, Standards and Rating Tools
- V. Incentive Schemes
- VI. Challenges and Recommendations

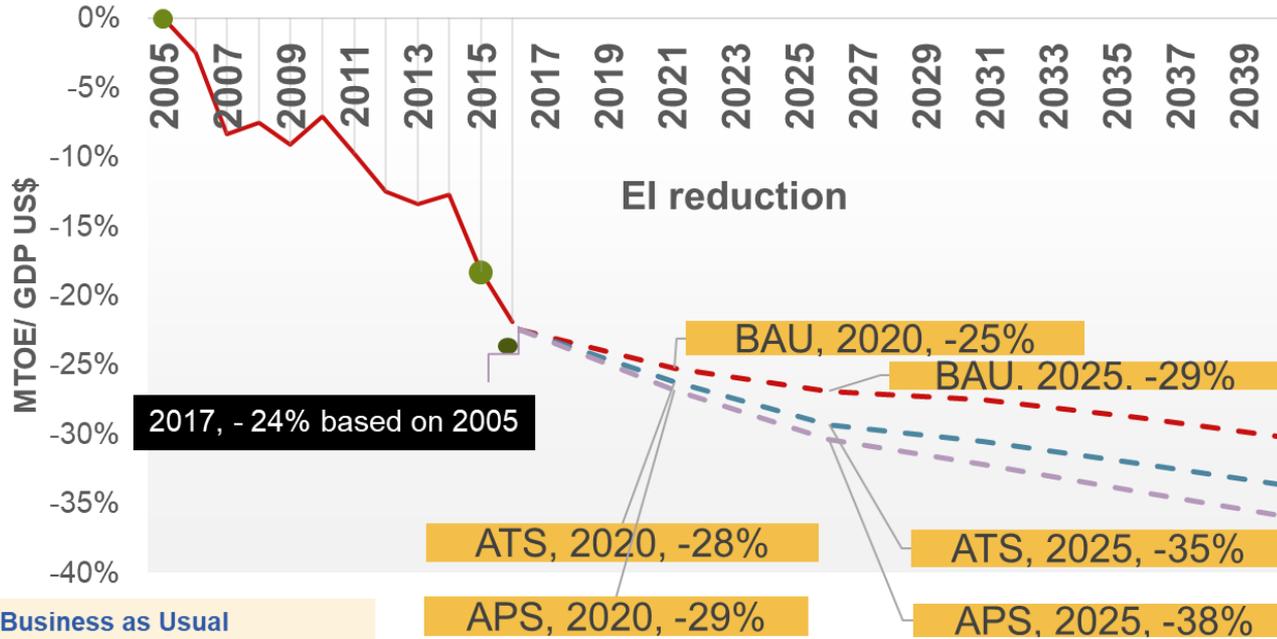


National Target on EE

Country	Reference Document	EE Target
 BN	Energy White Paper 2014	<ul style="list-style-type: none"> • 45% reduction of EI in 2035 compared to 2005 level
 KH	Cambodia EE Plan	<ul style="list-style-type: none"> • 20% reduction of TFEC in 2035 compared to BAU
 ID	National Energy Policy	<ul style="list-style-type: none"> • 1% reduction of EI per year until 2025 • 15% reduction of TFEC in each household and commercial sectors by 2025 compared to BAU
 LA	National EE Policy 2016	<ul style="list-style-type: none"> • 10% reduction of TFEC in 2030 compared to BAU
 MY	National EE Action Plan	<ul style="list-style-type: none"> • 8% reduction in electricity consumption in 2025 compared to 2016 level
 MM	National EE&C Policy	<ul style="list-style-type: none"> • 20% reduction of electricity consumption in 2030 compared to BAU
 PH	EE Roadmap for the Philippines, 2017-2020	<ul style="list-style-type: none"> • 40% reduction of EI in 2040 compared to 2005 level • 1% reduction of TFEC per year until 2040 compared to BAU
 SG	Sustainable Singapore Blueprint	<ul style="list-style-type: none"> • 35% reduction of EI in 2030 compared to 2005 level
 TH	Thai EE Policy 2015	<ul style="list-style-type: none"> • 30% of EI reduction in 2036 compared to 2010 level
 VN	National Target Program for EE&C	<ul style="list-style-type: none"> • 5-7% EI reduction in TFEC in 2025 compared to 2019 level

APAEC Target on EE

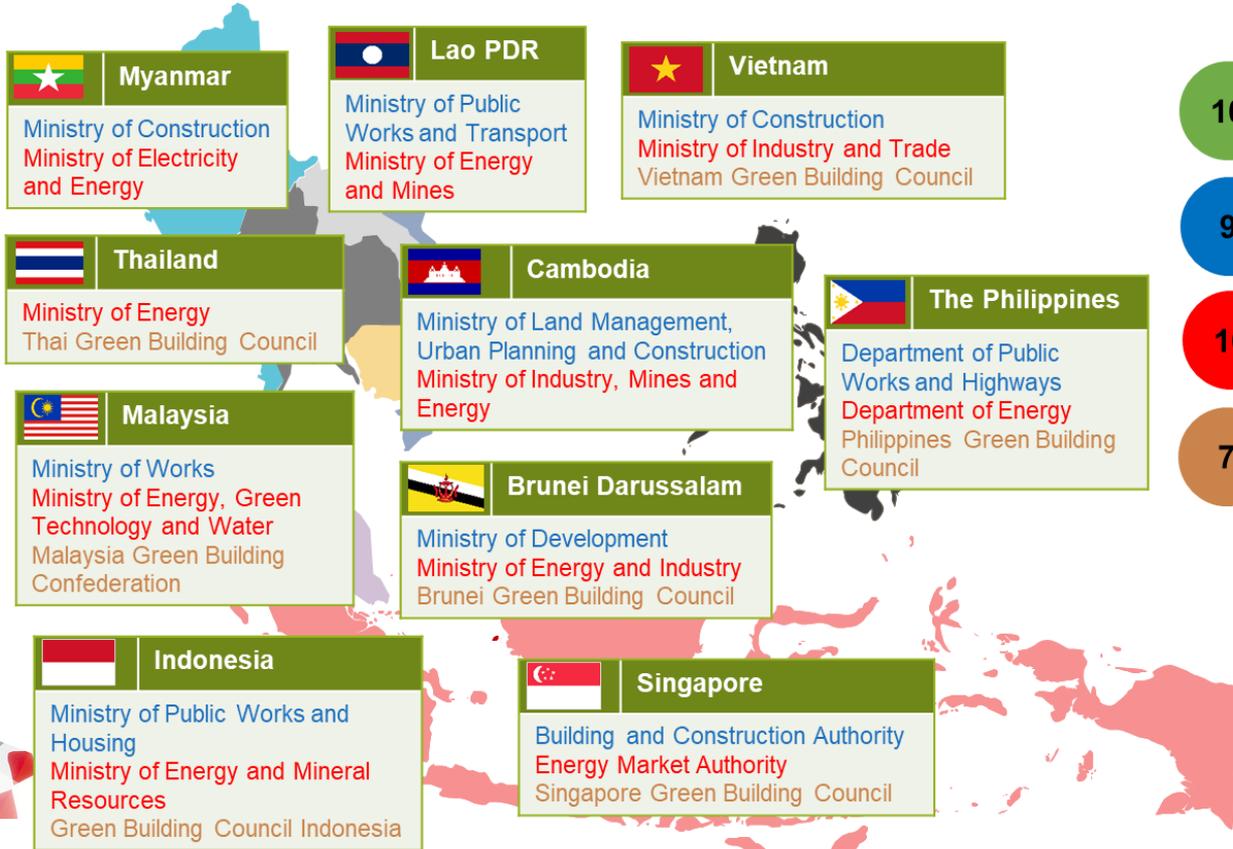
20% reduction in Energy Intensity (EI) by 2020 and 30% by 2025 (with 2005 baseline)



BAU- Business as Usual
ATS - AMS Targets Scenario
APS- ASEAN Progressive Scenario
(target defined the APAEC)

Source: The 5th ASEAN Energy Outlook

Stakeholders



- 10 Countries
- 9 Building-related Ministries
- 10 Energy-related Ministries
- 7 Green Building Councils



Strategic Plan and Policy on EE

Country	EE Strategic Plan	Policy, regulation and law
 BN	<ul style="list-style-type: none"> • Energy White Paper 2014 • Intended National Determined Contribution 2015 	<ul style="list-style-type: none"> • Standards and Energy Labelling for Products and Appliances (<i>pending</i>) • Energy Management Policy
 KH	<ul style="list-style-type: none"> • Energy Sector Development Plan 2005-2024 • National Policy Strategy and Action Plan on Energy Efficiency in Cambodia 2013 • National Strategic Development Plan 2014-2018 	
 ID	<ul style="list-style-type: none"> • National Master Plan for Energy Conservation 2005 • General Plan for National Energy 2017 	<ul style="list-style-type: none"> • Regulations on energy conservation, green buildings, electricity savings, ECS companies, etc. • Law No. 36/2005 on Buildings • Energy Law no. 30/2007 on Energy Conservation
 LA	<ul style="list-style-type: none"> • Energy Sector Assessment, Strategy, and Road Map 2013 	
 MY	<ul style="list-style-type: none"> • National Energy Efficiency Action Plan 2016-2025 • 11th Malaysia Plan 2016 	<ul style="list-style-type: none"> • Efficient Management of Electrical Energy Regulation 2008 • Electricity Supply Act 2001 • Energy Commission Act 2001

Strategic Plan and Policy on EE

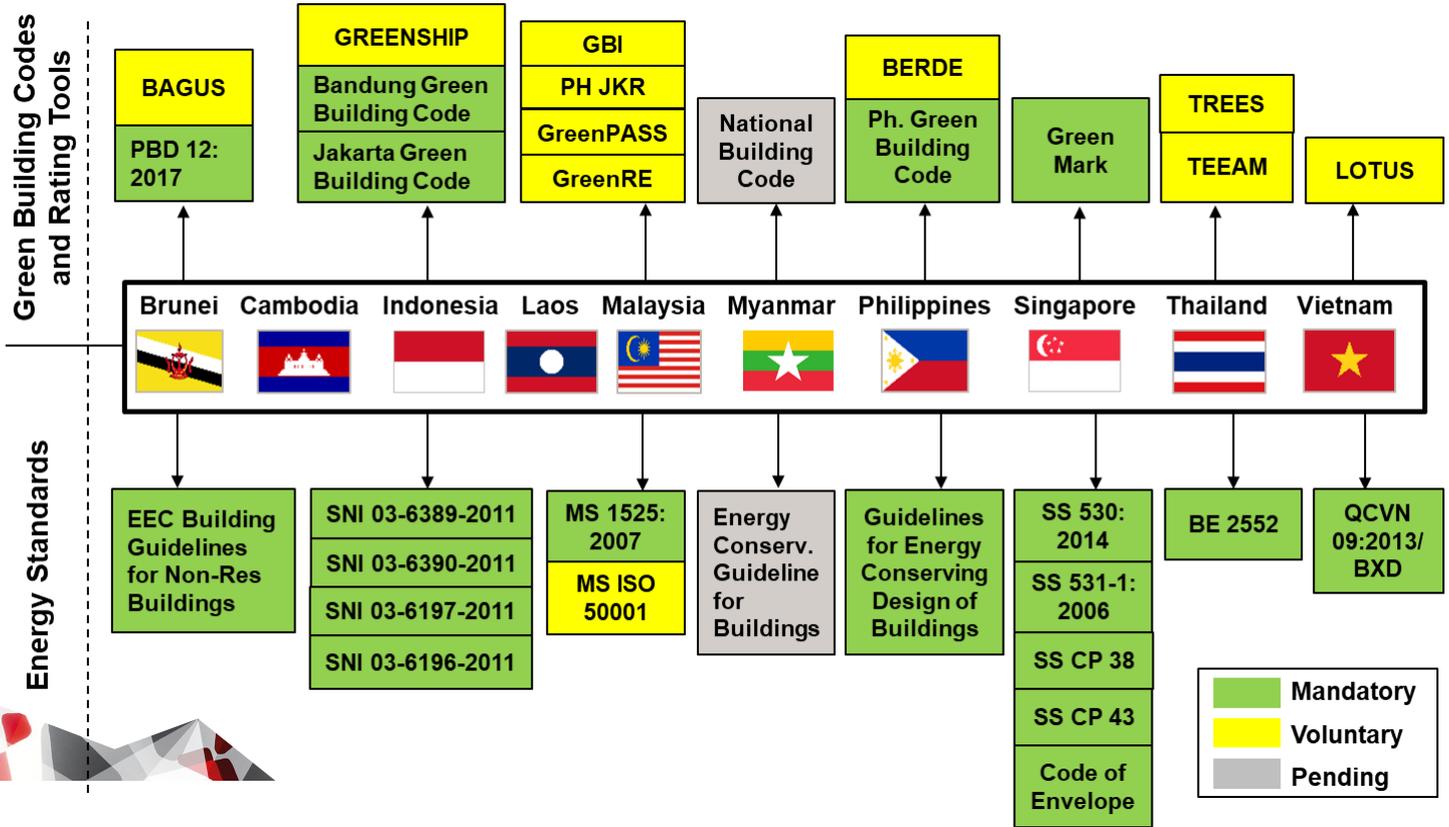
Country	EE Strategic Plan	Regulations, policy and law
 MM	<ul style="list-style-type: none"> National Energy Plan 2014 National Energy Efficiency and Conservation Policy, Strategy and Roadmap 2015 Myanmar Energy Master Plan 2015 	<ul style="list-style-type: none"> National Energy Policy 2014 Energy Efficiency and Conservation Law (<i>pending</i>)
 PH	<ul style="list-style-type: none"> Philippines Energy Efficiency and Conservation Roadmap 2017-2040 Philippines Energy Plan 2017-2040 	<ul style="list-style-type: none"> Energy Efficiency & Conservation Bill, Minimum Energy Performance for Industrial, Commercial & Transport, Enhancing ESCO Accreditation System, Enhancing Government Energy Mgmt Program (<i>pending</i>)
 SG	<ul style="list-style-type: none"> Energy Efficiency Singapore BCA Green Building Masterplan 2014 Sustainable Singapore Blueprint 2015 	<ul style="list-style-type: none"> National Energy Policy 2005 Building Control Regulations 2008 Singapore Building Control Act
 TH	<ul style="list-style-type: none"> 20-Year Energy Efficiency Development Plan 2011-2030 Thailand's Integrated Energy Blueprint 2015 	<ul style="list-style-type: none"> Energy Conservation Promotion Act (BE 2550) 2007
 VN	<ul style="list-style-type: none"> Vietnam National Energy Efficiency Program 2006-2015 National Targeted Program on EE&C 2012-2015 	<ul style="list-style-type: none"> Law on Economical and Efficient Use of Energy 2010 Law on Energy Efficiency and Conservation 2011 Decision No. 1427 – Energy Savings and Efficiency in Buildings

Overview of Green Building Rating Tools in ASEAN

Brunei Darussalam, Indonesia, Malaysia, Philippines, Singapore, Thailand and Vietnam have implemented green building rating tools that promote EE measures.



Green Building Codes, Rating Tools, and Energy Standards



Energy Efficiency Categories in Green Building Rating Tools

Brunei	Indonesia (GREENSHIP)	Malaysia (GBI)	Philippines (BERDE)	Singapore (Green Mark)	Thailand (TREES)	Vietnam (LOTUS)
<ul style="list-style-type: none"> • Building Envelope • Air-conditioning system • Building envelope - design/thermal parameters • Natural ventilation (exclude car park) • Artificial lighting • Ventilation in car parks • Ventilation in common areas • Lifts and escalators • Energy efficiency practices and features 	<ul style="list-style-type: none"> • Electrical sub-metering • OTTV calculation • Energy Efficiency measure • Natural lighting • Ventilation • Climate change impact • On-site renewable energy (bonus) 	<ul style="list-style-type: none"> • Minimum EE performance • Lighting zone • Electrical sub-metering • Renewable energy • Advanced EE performance • Enhanced commissioning • Post occupancy commissioning • EE verification • Sustainable maintenance 	<ul style="list-style-type: none"> • Energy sub-metering • Energy efficient lighting • Natural ventilation • n-site renewable energy generation • energy efficiency improvement • energy efficiency building envelope 	<ul style="list-style-type: none"> • Building envelope - ETTV • Air-conditioning system • Building envelope - design/thermal parameters • Natural ventilation/mechanical ventilation • Daylighting • Artificial lighting • Ventilation in carparks • Ventilation in common areas • Lifts and escalators • Energy efficient practices and features • Renewable energy 	<ul style="list-style-type: none"> • Minimum energy efficiency • Energy efficiency • Renewable energy • Refrigerant in air-conditioning systems that does not destroy ozone layer 	<ul style="list-style-type: none"> • Passive design • Total building energy • Building envelope • Natural ventilation and air-conditioning • Artificial lighting • Energy monitoring and management



Incentives Schemes related to EE and Green Buildings

Country	Tax Benefits	Capital Funding	Loan	Technical Assistance	Credit Guarantee	Others (ESCOs, Cash Incentives)
 BN	✓					
 KH						✓
 ID	✓			✓		✓
 LA	✓					
 MY	✓	✓				✓
 MM						
 PH						
 SG		✓	✓	✓	✓	✓
 TH			✓		✓	✓
 VN				✓		✓



Policy Challenges and Recommendations

No	Challenges	Recommendations
1	Communication between various government ministries and departments	Develop a comprehensive roadmap with clear targets and objectives
2	Consultation from private stakeholders in developing policies, codes and regulations	The government ministries and departments to set up mechanisms to receive inputs from private stakeholders
3	Unavailability of dedicated institution to address EE in buildings from developing policies to implementation and reporting	Create a one-stop shop dedicated institution to address all matters related to EE in buildings
4	Unavailability of clear targets to achieve EE in buildings	Assessment of baseline energy consumption to verify the achieved energy saving and establish future target
5	Existing codes are not in line with international practices (e.g. ASHRAE)	Review available international best practices and adapt for national context
6	Unavailability of legal and regulatory measures in some AMS	Enact laws on EE supported by guidelines for public and private buildings
7	High initial cost of EE technologies and unavailability of financing and incentive schemes	Provide funding as soft loans at low interest rate to financing institutions
8	Low energy tariffs leading to longer payback periods of EE measures	Introduce incentive schemes for EE and reduce subsidy on fossil fuel

Technical Challenges and Recommendations

No	Challenges	Recommendations
1	Buildings are constructed with active systems while local material availability is not considered	Incorporate passive design concepts in building construction
2	EE is often not considered at an early stage of construction	Including EE measures as early as possible will help achieve higher energy saving during operation
3	Energy audit and site verification are often not conducted	Conduct independent energy audit of building and site verification before and after EE measures
4	Unavailability of measurement, reporting and verification (MRV)	Establish central institution that performs MRV before rating certificate is allocated
5	The existing codes and standards apply to selected technologies only	Extend existing codes and standards to cover large range of equipment
6	Unavailability of data collection and analysis	Collect data through utility companies and implement MRV system
7	Narrow selection of building types covered by the codes/standards	The regulatory requirement must be extended to cover more building types
8	The need to adapt building EE codes according to local climatic design	Clear understanding of site-specific data to optimize climatic responsive design for EE
9	The codes/standards do not consider urban heat island (UHI) effect	Consider UHI mitigation strategy in the building codes
10	Unavailability of tools and software to study building performance	Develop and disseminate simple to use tools and calculation methodologies

Common Challenges and Recommendations

No	Challenges	Recommendations
1	Limited skilled manpower to implement EE measures	Organize training sessions to train manpowers on EE measures and certify building professionals and energy auditors
2	Limited awareness on the overall objective of EE in buildings	Implement campaign for the general public to raise awareness about the positive impact of saving energy in buildings
3	Unavailability of codes and standards in public domain, and the codes and standards are often outdated	Develop codes and standards specific to building types that are updated regularly



Nexus@OneNorth, Singapore

Summary

- National energy efficiency targets and strategic plan exist in all ASEAN Member States (AMS)
- Most AMS have developed Energy Standards and Green Building Codes as well as Rating Tools. However, not all codes, standards and rating tools are mandatory.
- The enforcement of the codes and standards via policy, regulations and law vary from one another
- The Green Building Council are important players to support the ministries in developing and enacting codes and standards
- Although some countries have implemented GBC and EE standards, some challenges are still identified in ASEAN as a region



Green Building Code (GBC) Dissemination Workshop

- Held during the 23rd EE&C-SSN Meeting on 24 April 2019 in Bangkok, Thailand
- Participated by representatives from 8 AMS and other DPs & IOs
- Acknowledgement that the report can be used as a reference to develop the regional GBC as well as beneficial for AMS to develop or improve their GBC system



Outcomes: Regional Action Plans

In the GBC Report Dissemination Workshop, an FGD was conducted based on the identified challenges from the report, to prioritise and recommend regional action plans in developing regional GBC.

Policy	Technical	Common
<ul style="list-style-type: none"> Identify roadmap through data mapping 	<ul style="list-style-type: none"> Develop regional standard and Regional Guideline for passive and active design, energy audit, energy management and MRV 	<ul style="list-style-type: none"> Develop ASEAN GB guideline/curriculum for auditors, consultants and building professionals
<ul style="list-style-type: none"> Increase national GBC stakeholder participation to the activities of the roadmap 	<ul style="list-style-type: none"> Effectiveness of EC guideline 	<ul style="list-style-type: none"> Develop national awards in the area of EE&C and provide incentives for certified GB
<ul style="list-style-type: none"> Conduct donors mapping and coordination 	<ul style="list-style-type: none"> Capacity Building on energy managers, auditors and verifiers 	<ul style="list-style-type: none"> Form a technical committee for codes and standards
		<ul style="list-style-type: none"> Create database platform which is regularly updated



Thank You

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As a federally owned enterprise, GIZ supports the German Government in achieving its objectives in the field of international cooperation for sustainable development.

Published by:

Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH

Registered offices
Bonn and Eschborn

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