



Regional Context of AC MEPS (Minimum Energy Performance Standard) and Initiatives in ASEAN

AC WEBINAR - CEFIA FLAGSHIP

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ASEAN Centre for Energy (ACE)

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About

Established in January 1999, ASEAN Centre for Energy (ACE) is an **intergovernmental organization** within ASEAN structure that **represents the 10 ASEAN Member States'** interests in the energy sector.

What We Do?

Catalyst



Unify and strengthen **ASEAN energy cooperation** by providing a platform for sharing, policy advisory, best practices, and capacity building.

Knowledge Hub



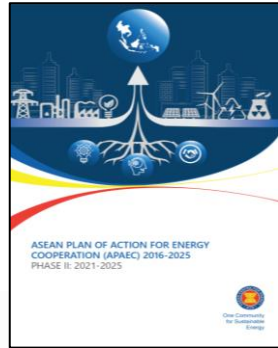
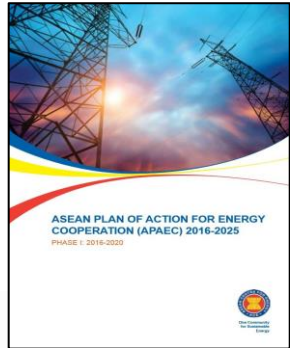
Provide a **knowledge repository** for ASEAN Member States (AMS) and services through data management, publication, and dissemination.

Think Tank



Assist AMS on **research and identifying practical and specific solution** on policies, legal, and regulatory frameworks, technologies, and innovative solutions.

ASEAN Plan of Action for Energy Cooperation (APAEC)



- Enhancing Energy Connectivity and Market Integration in ASEAN to Achieve Energy Security, Accessibility, Affordability and Sustainability for All
- Accelerating Energy Transition and Strengthening Energy Resilience Through Greater Innovation and Cooperation

APAEC Programme Areas



To reduce energy intensity by 32% by 2025 and encourage EE&C efforts, especially in transport and industry



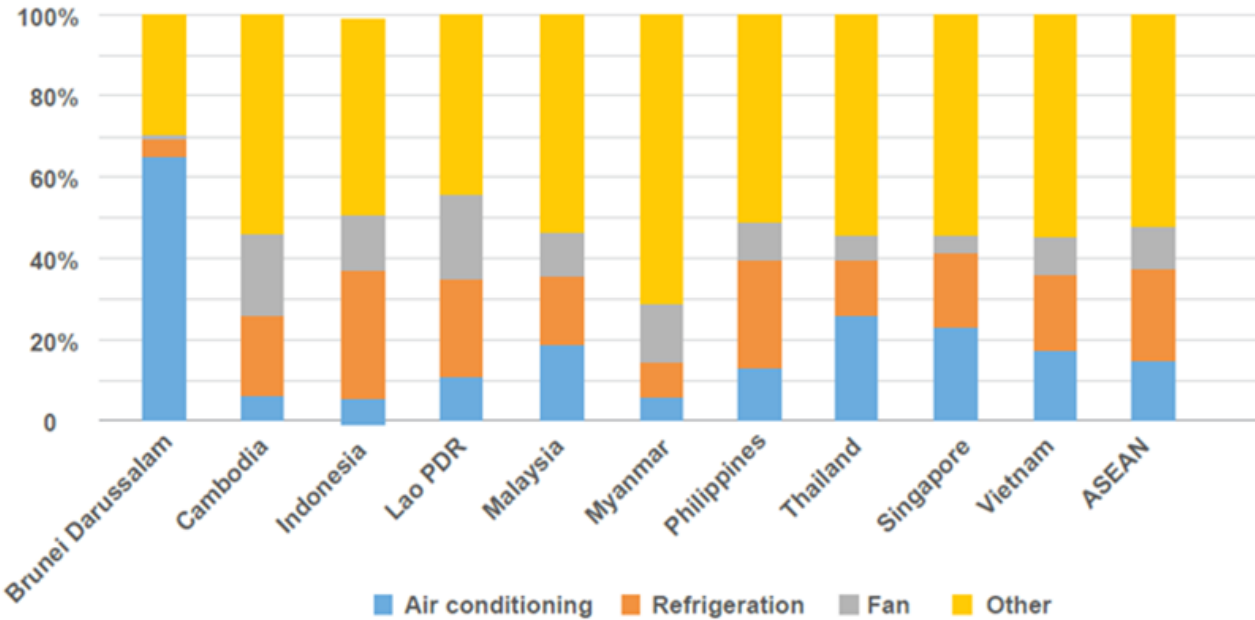
Outcome-Based Strategies

- OBS1** : Expand, Harmonise, and Promote EE S&L (Energy Efficiency Standards & Labeling)
- OBS2** : Enhance Participation of Private Sector, Financial Institutions, and Clusters
- OBS3** : Strengthen Energy Efficiency in Building
- OBS4** : Pursue Energy Efficiency in Transport
- OBS5** : Advance Energy Efficiency in Industry

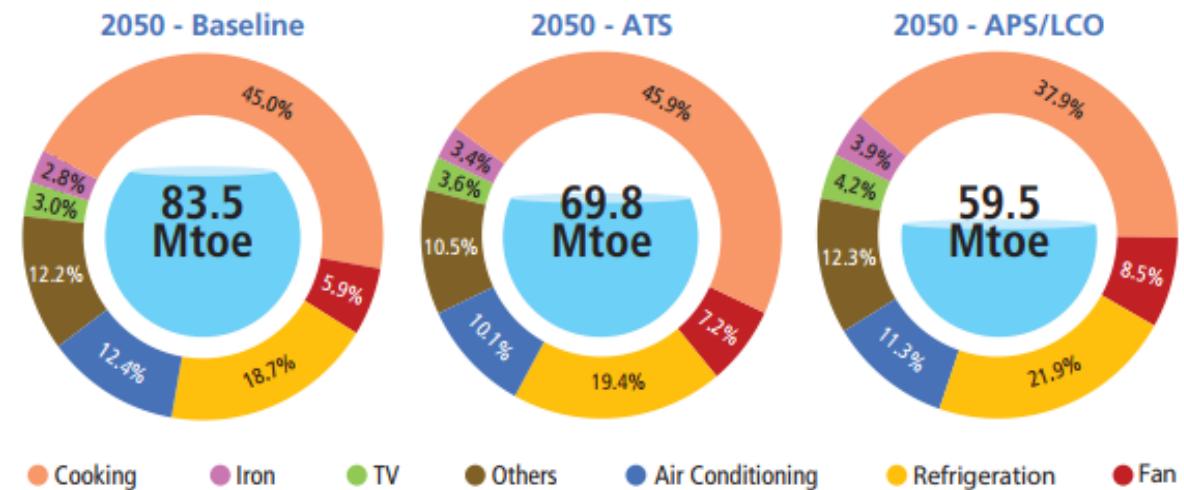
Share of Residential Appliances in 2050



By ASEAN Countries



By Types of Appliances (across scenarios)



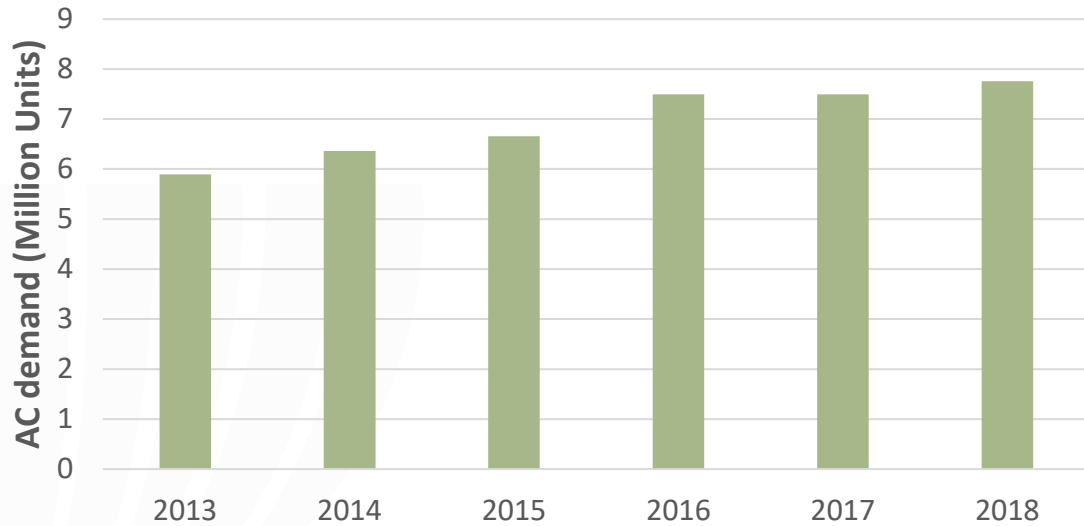
Source: AEO7 model analysis, based on ACE compilation of historical data (ACE and GIZ, 2020)

- ACs are projected to be **one of the largest energy consumers** in the residential sector by 2050
- To mitigate this high energy consumption, increasing the penetration of efficient air conditioning units by **60% to 100% by 2050** is suggested

AC Energy Demand and Savings Potential in ASEAN

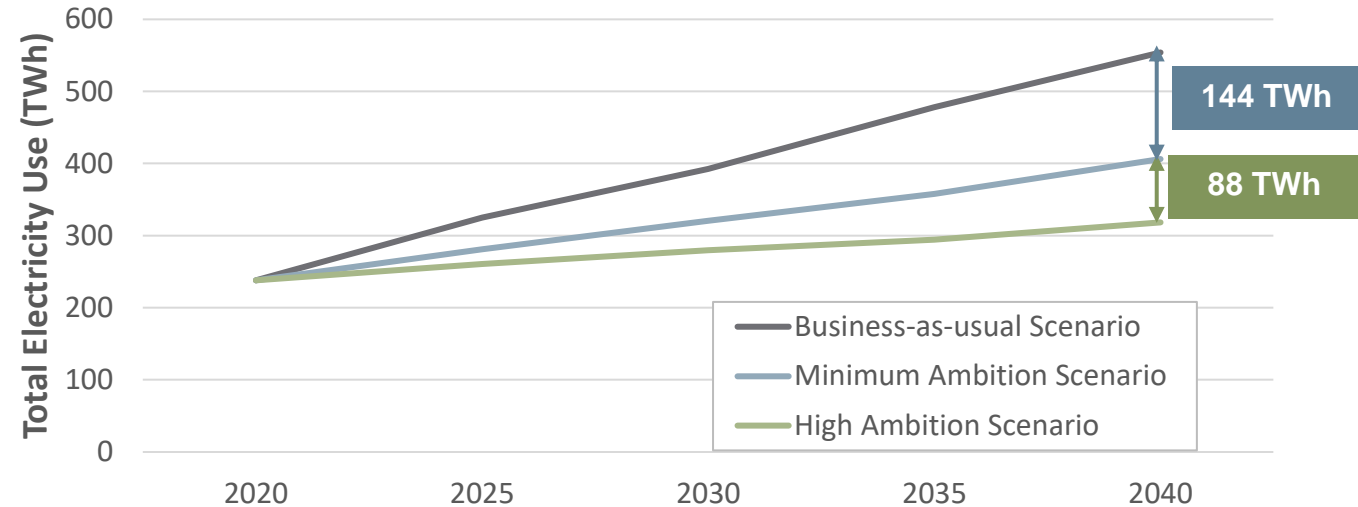


Annual Demand of Room AC in ASEAN



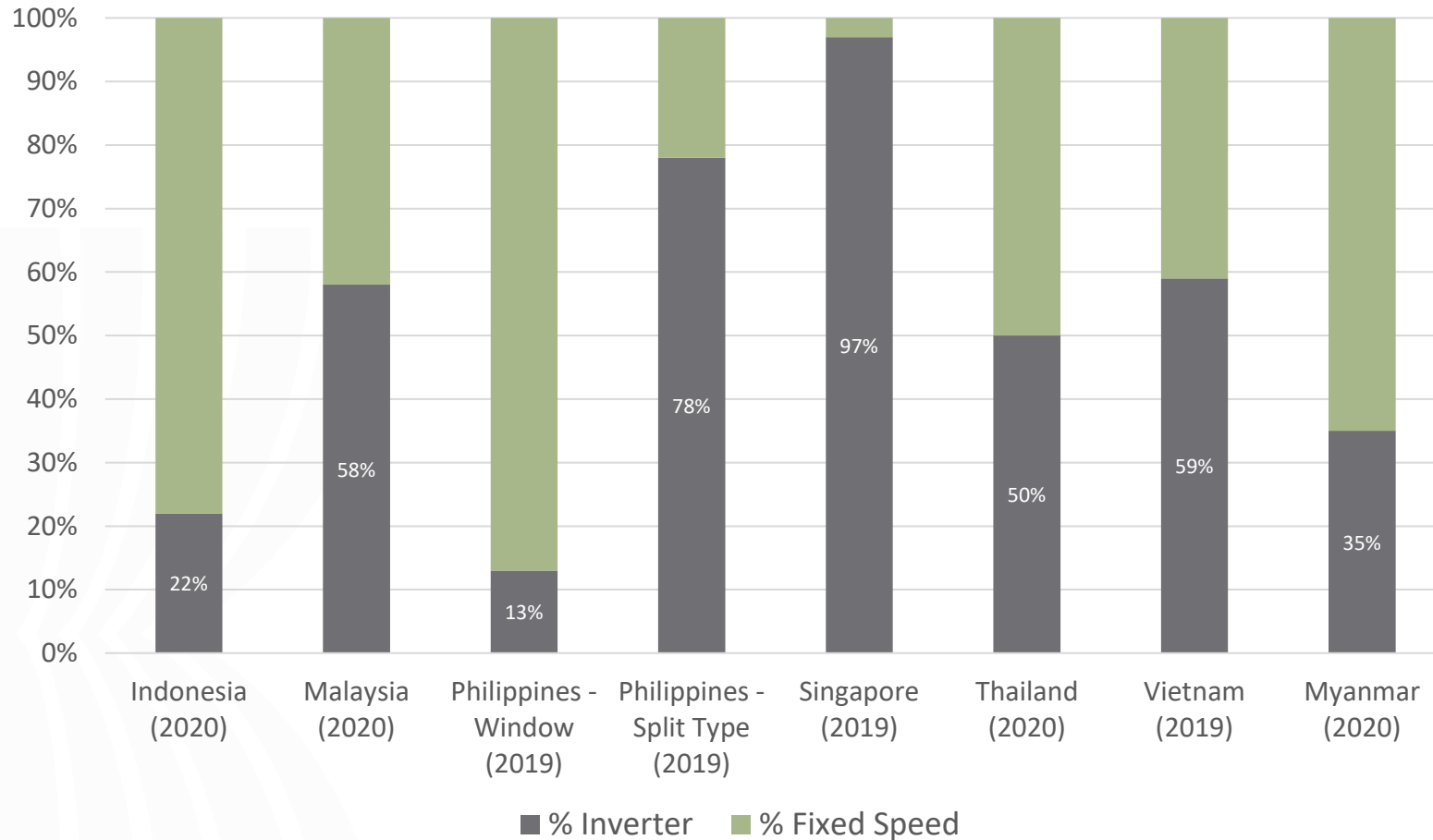
Source: ACE, 2021

ASEAN Savings Potential of Energy-Efficient AC (By 3 Scenarios)



- AC units in ASEAN are estimated to reach **300 million by 2040**
- Energy efficient AC could save **144 TWh of electricity** consumption and save **101 million tones of CO₂ emissions** annually in ASEAN by 2040

Market Shares of Fixed Speed and Inverter Room AC in ASEAN



- Inverter ACs have gained significant market share with **over 50% of models in most countries**, except Indonesia and Myanmar.
- **Inverter AC is more efficient** than fixed speed AC, because Inverter AC uses a compressor controlled with a variable speed drive (VSD), which operates at part-load more frequently and **delivers precise cooling as required.**

Source: ACE, 2021

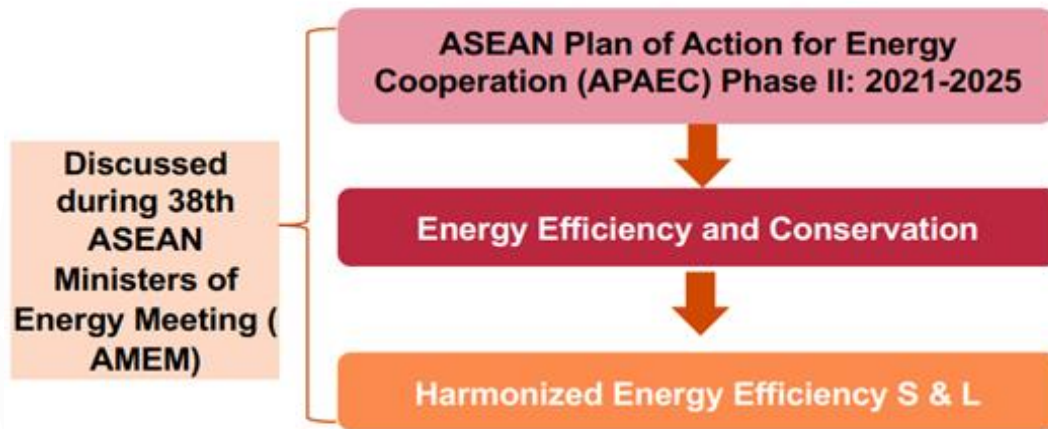
ASEAN Harmonisation of MEPS for Air Conditioners



Objective:

To remove trade barriers amongst ASEAN Countries and maintain a single production base for appliances.

To curb the sale of unregulated products in all ASEAN countries.

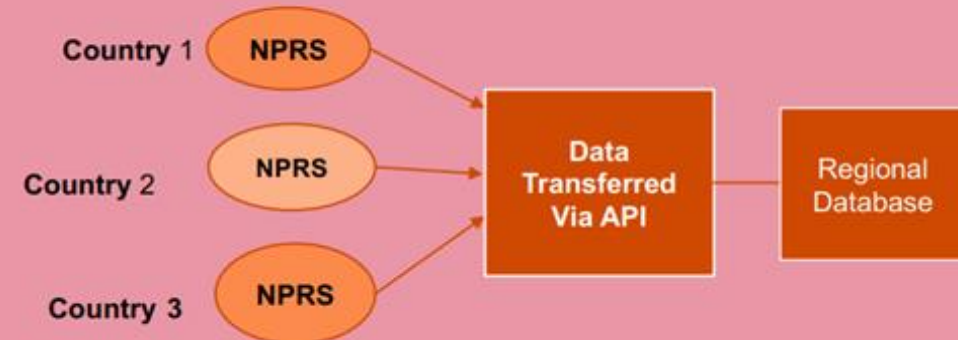


ACE and ASEAN EE&C-SSN FPs has initiated the harmonization of S&L in ASEAN region for AC and lighting

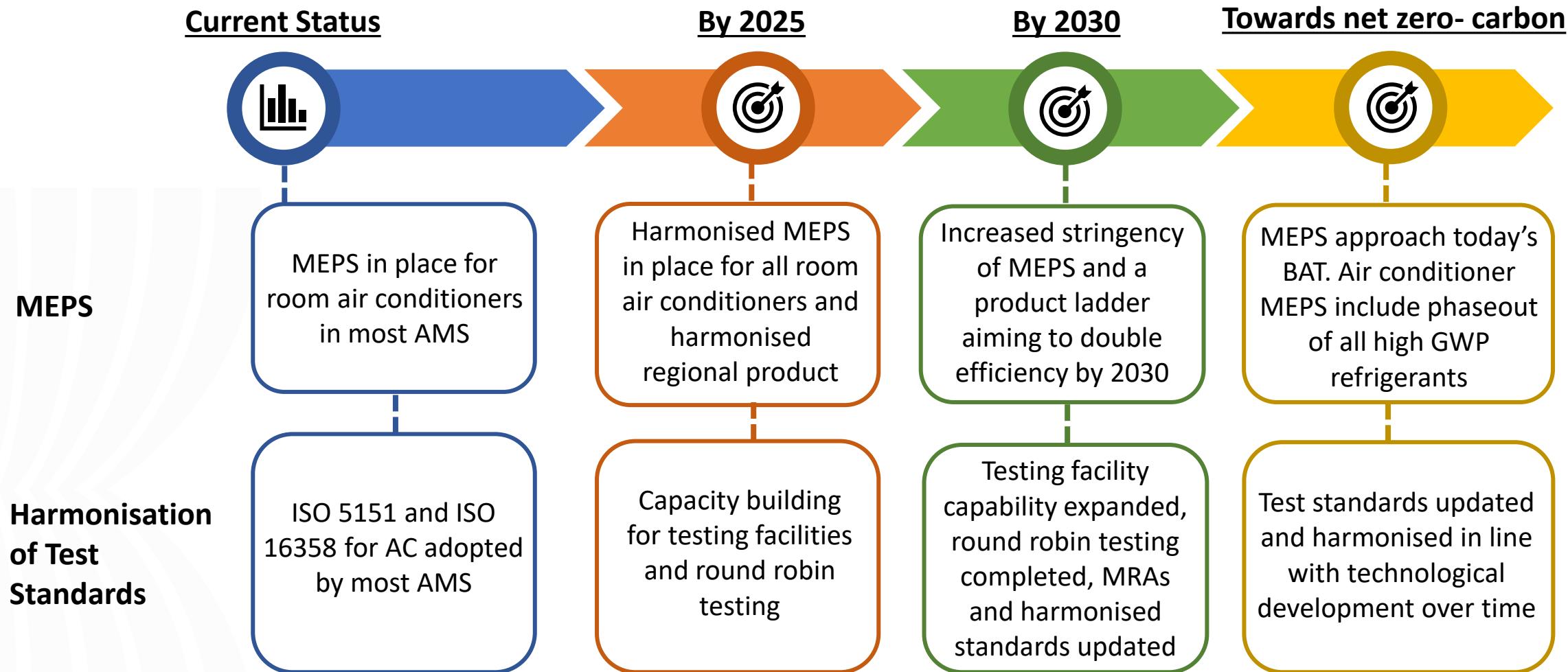
ASEAN Regional Roadmap for EE Harmonization

- Harmonization of Testing Methods
- Harmonization of Evaluation Methods
- Harmonization of MEPS
- Testing Infrastructure
- Inclusion of Energy testing into existing Mutual recognition Agreement(MRA)
- Reporting : development of a common product database for all ASEAN member States

ASEAN Product Registry System



ASEAN Roadmap towards Sustainable and Energy-Efficient Space Cooling in ASEAN Summary of Policy Measures



Source: ACE and IEA, 2022

AC MEPS Level Status in ASEAN



Country	Cooling Capacity (CC)	MEPS	Year	Metrics
Brunei Darussalam	CC < 7.1 Kw	2.9	2021	COP
Cambodia				
Indonesia	CC ≤ 7.9 kW	3.4	2023	CSPF
Thailand	CC ≤ 8 kW, 8 kW < CC < 12 kW	New drafts: 3.19 (W), 3.19 (FS), 3.90 (VS), 3.15 (W), 3.15 (FS), 3.46 (VS)	Draft 2021	CSPF
Lao PDR*	CC ≤ 3.52 kW 3.52 kW < CC ≤ 8 kW 8 kW < CC ≤ 12 kW	3.08 (FS), 3.4 (VS), 3.03 (FS), 3.3 (VS), 2.97 (FS), 3.2 (VS)	2022	CSPF
Viet Nam	CC < 4.5 kW 4.5 kW ≤ CC < 7 kW 7 kW ≤ CC < 12 kW	3.10 3.00 2.80	In force since 2017	CSPF

Country	Cooling Capacity (CC)	MEPS	Year	Metrics
Malaysia	CC < 4.5 kW 4.5 kW ≤ CC ≤ 7.1 Kw	3,10 2,9	2018	CSPF
Myanmar	CC ≤ 5.5 kW, 5.5 kW < CC < 12 kW	3,08 2,89 (none)	Voluntary in 2022, Mandatory in 2023	CSPF
Philippines	CC < 3.33 kW, 3.33 kW ≤ CC < 10 kW, 10 kW ≤ CC < 14 kW	3,08 2,81 (none)	2019	CSPF
Singapore	Up to 17.6 kW	CSPF 6.1 (Inverter) CSPF 6.86 (Non-Inverter)	2023	EER EER WEER

Source: ACE, 2021

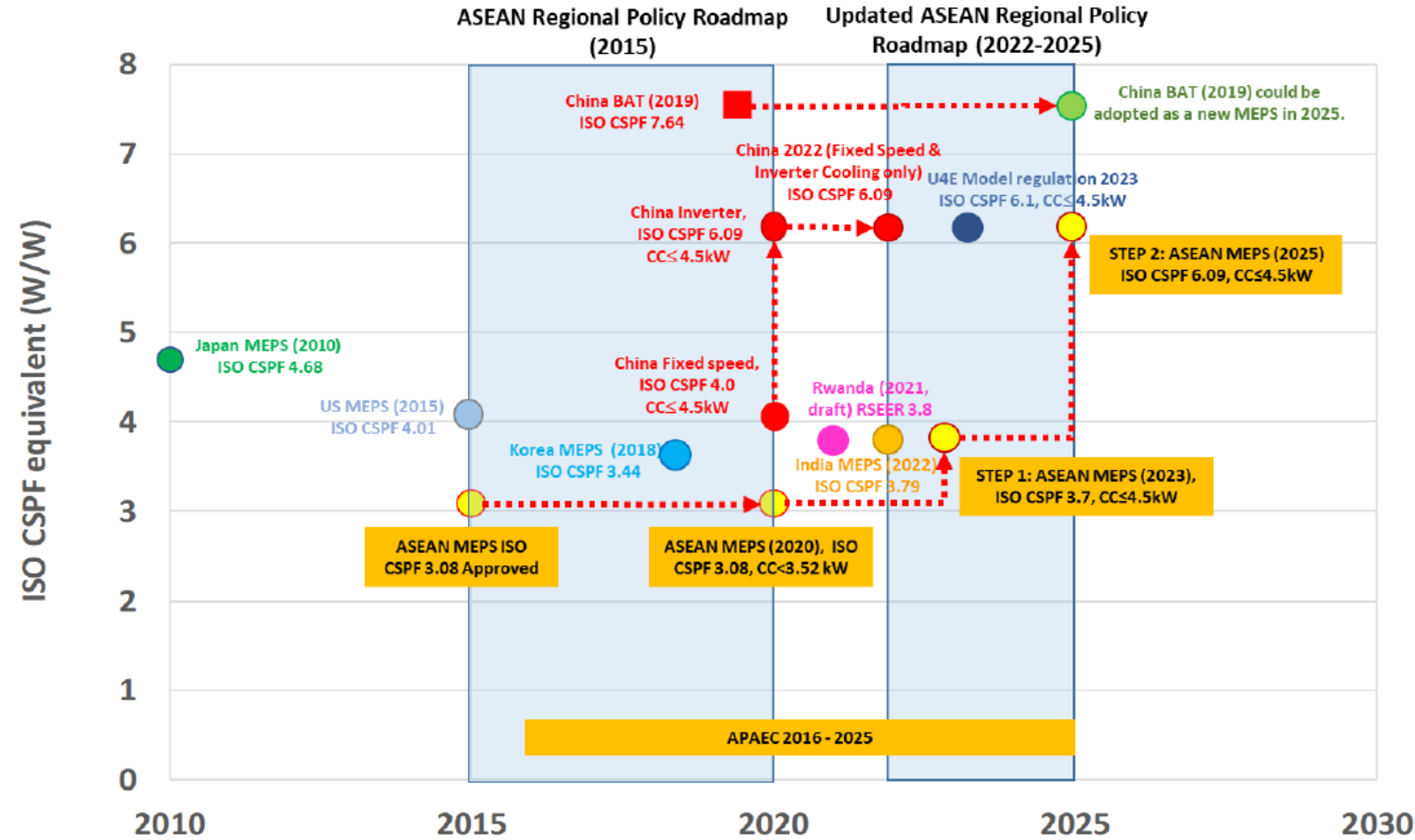
Status of ASEAN EE Standards & Labeling on AC



Country	ISO:5151-2010 AC Test Standard	ISO:16358-1 AC Evaluation Standard	Labelling	M&V
Brunei Darussalam	Adopted		Mandatory	
Cambodia			Planning	
Indonesia	Adopted	Adopted	Mandatory	Registration and periodic market surveillance
Lao PDR	Adopted	Adopted	Planning	
Malaysia	Adopted	Adopted	Voluntary	Consignment test and periodic market surveillance
Myanmar	Planning	Planning	Planning	Five-year periodic market surveillance
Philippines	Adopted	Adopted	Mandatory	Periodic market surveillance
Singapore	Adopted	Adopted	Mandatory	Registration and Periodic market surveillance
Thailand	Adopted	Adopted	M: MEPS V : HEPS	Yearly market surveillance and verification
Vietnam	Adopted	Adopted	Mandatory	Yearly market surveillance and verification

Source: ACE and IEA, 2022

Way Forwards: Update ASEAN Regional Policy Roadmap



The current ASEAN regional MEPS for RACs adopted **ISO CSPF of 3.08 in 2020** for models below 3.52 kW cooling capacity



Updated ASEAN Regional Policy roadmap (2022-2025) towards:

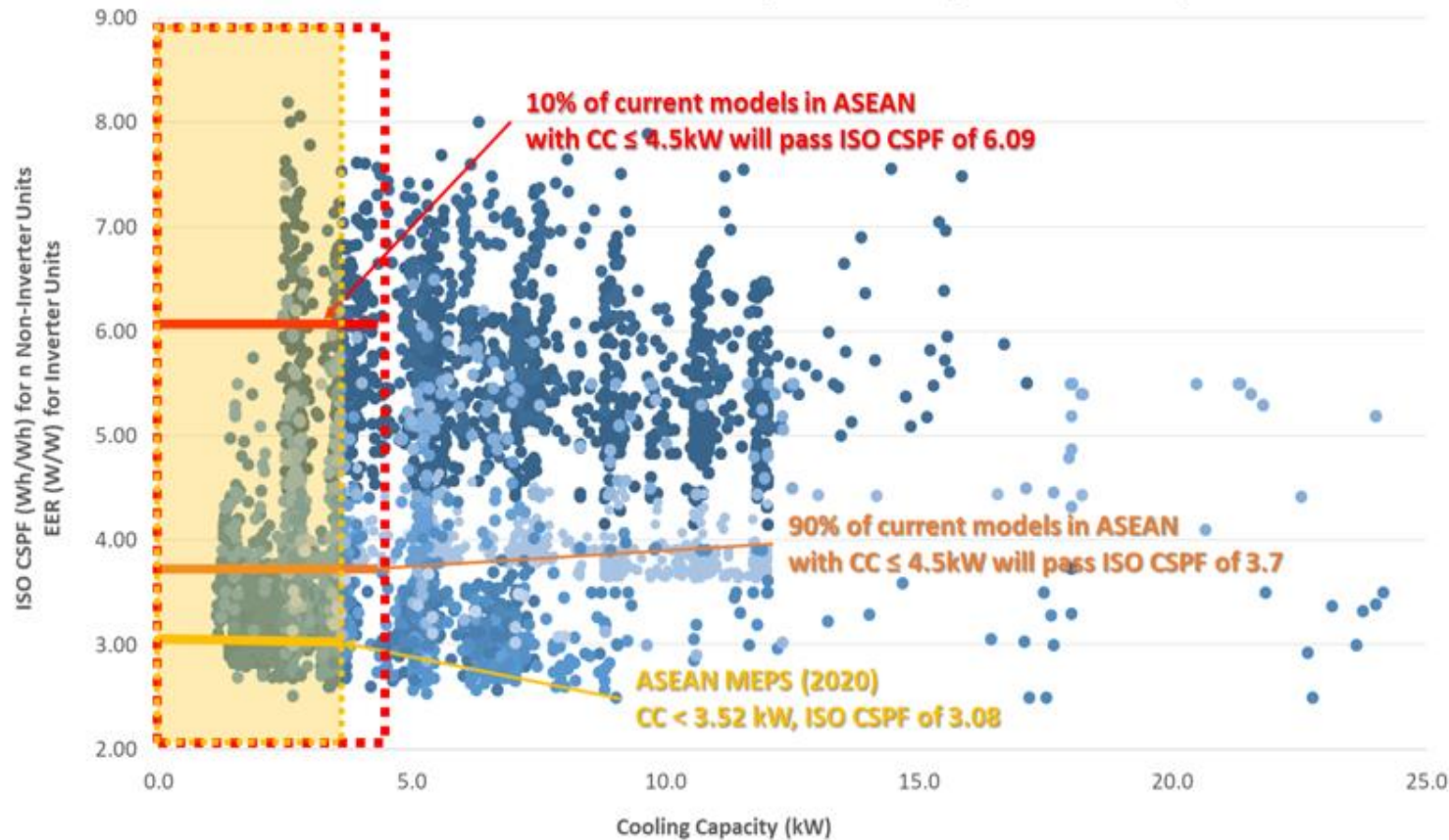
- **Step 1: ISO CSPF of 3.70 in 2023**
- **Step 2: ISO CSPF of 6.09 in 2025**

Source: ACE, 2021

Way Forwards: Extending Scope of AC MEPS in ASEAN



8,900 AC Models in ASEAN (2019-2020), CC 1.5kW up to 25kW



Popular ACs in many ASEAN countries have capacities **between 3.52 kW and 4.5 kW**



Extending the scope to cover AC with capacities **up to 4.5 kW** by 2023 will ensure the regional MEPS covers the prevalent models in the region.

Source: ACE, 2021

ASEAN Cool Initiative (2023 – 2024)



Implementing Partner



ASEAN Centre for Energy
One Community for Sustainable Energy

Project Lead



Other Technical Partners



BERKELEY LAB

Objective:

- To support the goals of ASEAN Plan of Action and Energy Cooperation (APAEC) Phase II (2021-2025)
- To accelerate the implementation of MEPS on air conditioners in the region through an update of the regional roadmap

Output Activities:

• **MEPS and Labels:**

- Data collection on products in the market along with technical and cost-benefit analysis
- Regulations with MEPS aligned with the regional air conditioner MEPS and low-GWP refrigerants
- Stakeholder engagement and consultations
- Awareness raising with local SMEs (Small and Medium Enterprises), manufacturers, and assemblers

• **Regional Level Activities:**

- Regional savings analysis
- Awareness and dissemination activities including 2 regional workshops

ASIA Low Carbon Building Transition (ALCBT) (2023 – 2027)

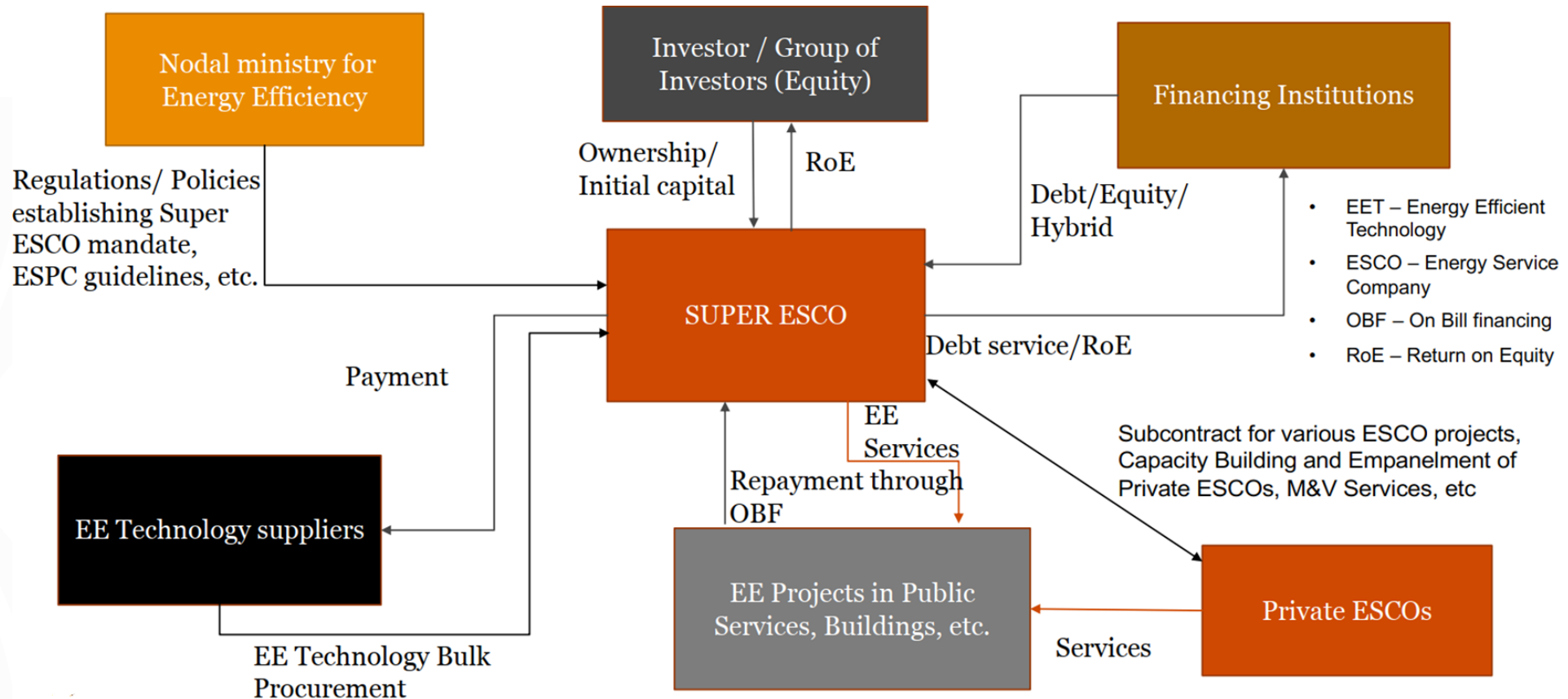
Enabling the Market-Based Mechanism for the Adoption of Higher Energy Efficient AC in ASEAN



Supported by



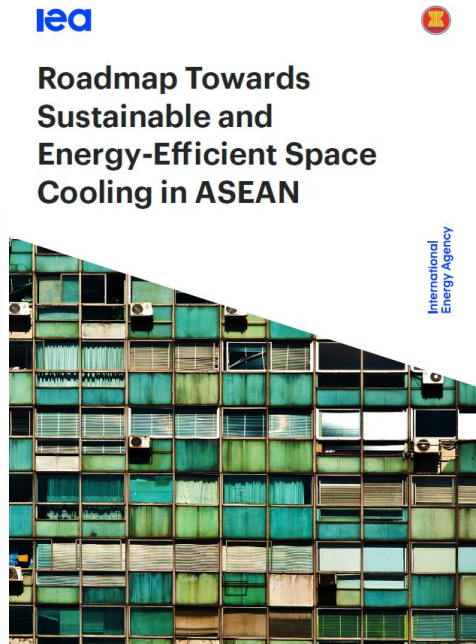
Implementing Partner



ACE Publications about Air Conditioners



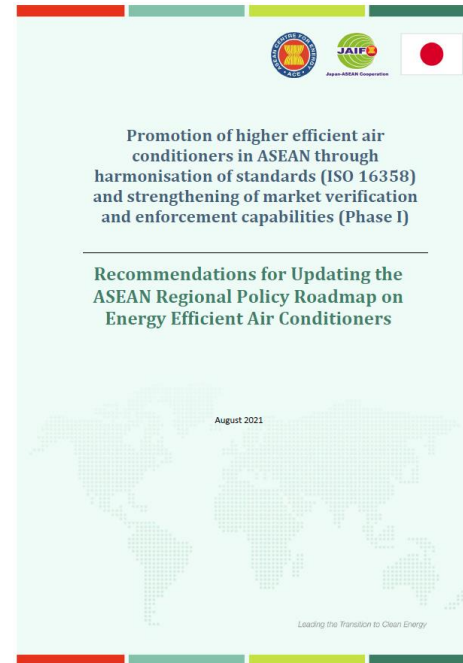
(2022)



The Roadmap towards Sustainable and Energy-Efficient Space Cooling in ASEAN focuses on the policy tools available to drive energy efficiency improvements for space cooling

<https://aseanenergy.org/publications/roadmap-towards-sustainable-and-energy-efficient-space-cooling-in-asean/>

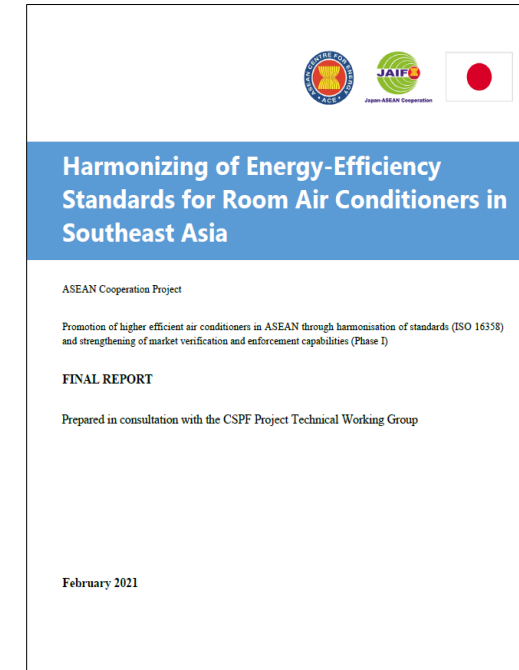
(2021)



Summarises findings from review of the current situations of AC Minimum Energy Performance Standards (MEPS) and market profiles in ASEAN

<https://aseanenergy.org/publications/recommendations-for-updating-the-asean-regional-policy-roadmap-on-energy-efficient-air-conditioners/>

(2021)



Overview of seasonal AC energy-efficiency metrics and recommendations for adopting ISO standard 16358 in a harmonised way across the region

<https://aseanenergy.org/publications/harmonizing-on-energy-efficiency-standards-for-room-air-conditioners-in-southeast-asia/>

Conclusion



- About 268 TWh could be saved across the region in 2040 by directly leapfrogging to MEPS Phase II levels (6.09 CSPF), resulting in 209 MtCO₂e carbon abatement and up to \$32 billion in electricity bill savings for consumers in the ASEAN region.
- ACs are projected to be one of the largest energy consumers in the ASEAN residential sector, accounting for about 82% of the sector's demand by 2050 and are expected to reach 300 million AC units by 2040.
- Inverter AC units are typically 20-30% more efficient than non-inverter units and have gained a significant market share, accounting for over 50% of models in most ASEAN countries.
- Given this benefits, ACE will work to address this challenge towards adoption of higher MEPS level for AC in ASEAN, including:
 - Conduct detailed market assessments and various relevant analyses for each ASEAN country completed, to understand the techno-economic impacts of the proposed MEPS levels
 - Strengthening capacity of relevant institution and stallholder for energy efficient Air conditioner
 - Strengthening Regional Cooperation through digital platform and knowledge sharing among ASEAN members by establishing
 - Enabling private investment to support the adoption of higher efficient AC



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Thank You