Opening Remarks

ASEAN Energy Efficiency Landscape for Air Conditioners

Saikiran Kasamsetty
Energy Efficiency Specialist
United Nations Environment Programme, Energy & Climate Branch

5 November 2024

United for Efficiency – Leapfrogging to Energy-Efficient Lighting, Appliances and Equipment

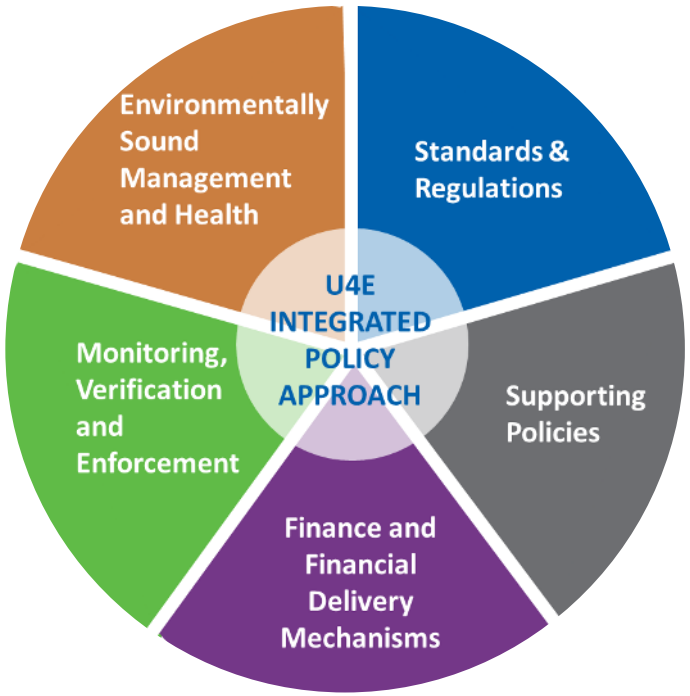
- Launched United for Efficiency (U4E) in 2014 at the UN Secretary General's Climate Summit.
- Initiative contributes to Sustainable Development Goal 7.3

7 AFFORDABLE AND CLEAN ENERGY

7. Ensure access to affordable, reliable, sustainable and modern energy for all

7.3 By 2030, double the global rate of improvement in energy efficiency

The Programme combines the forces of the private and public sectors on high impact opportunities – lighting, appliances and equipment



United for Efficiency: Partner Organizations

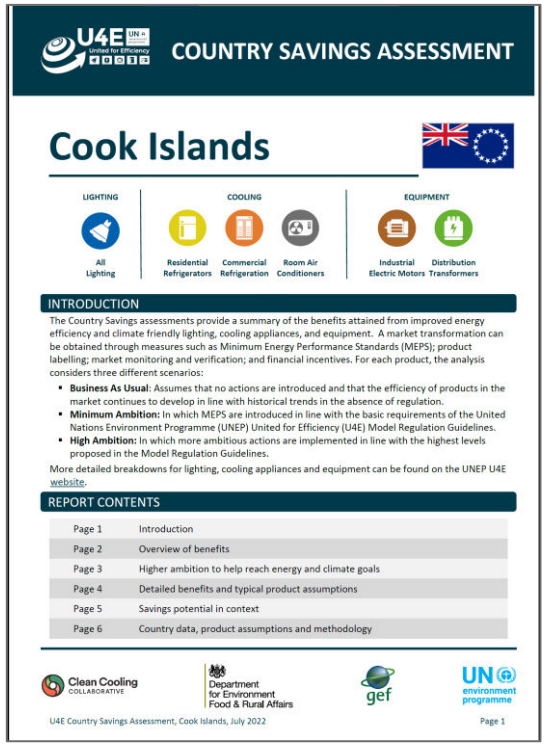
Manufacturers & Industry Associations

Technical Organizations & Centres

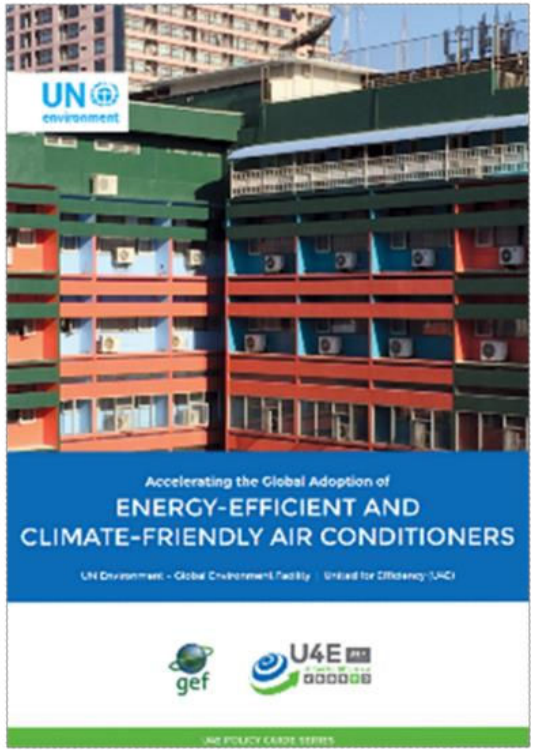
Funders and Financiers

International Organizations & Initiatives

U4E Tools and Guidance: Overview

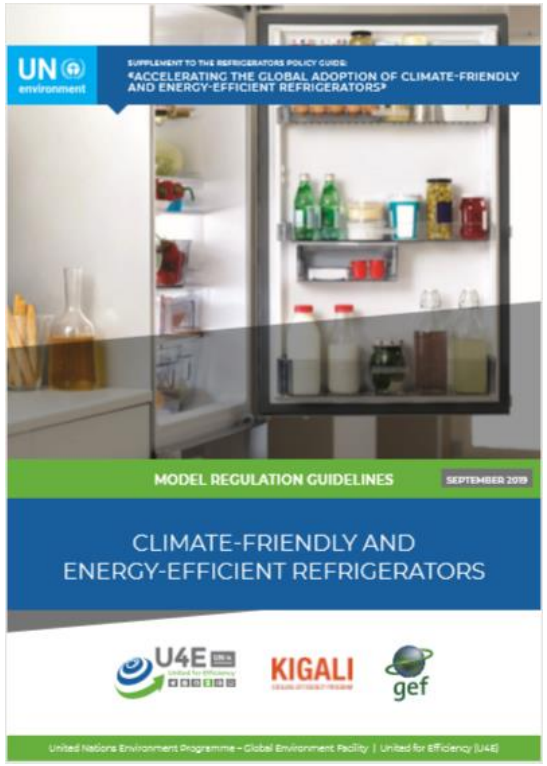


Country Savings Assessments



Policy Guides

Technical Guidance



Model Regulations

Why **is EE important? Which products should we prioritise?**

→

Which **integrated policies and interventions should be considered? How have others done it?**

→

How **to analyze data, test products, enforce regulations?**

→

Which **scope, performance, safety, testing, etc. are a good starting point for MEPS & labels?**

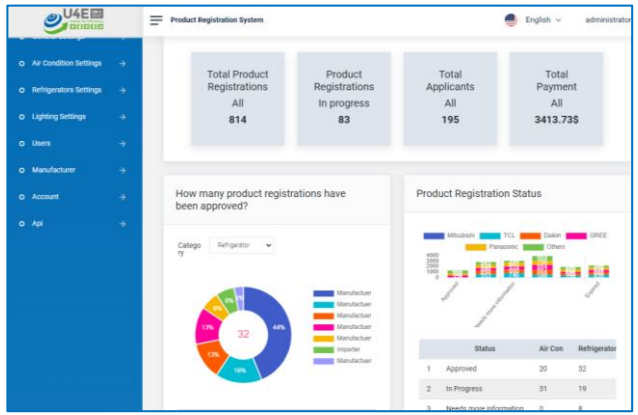
How to offset the higher purchase price of efficient products and send demand signal to vendors?

How to monitor the market, enhance enforcement, and share information?

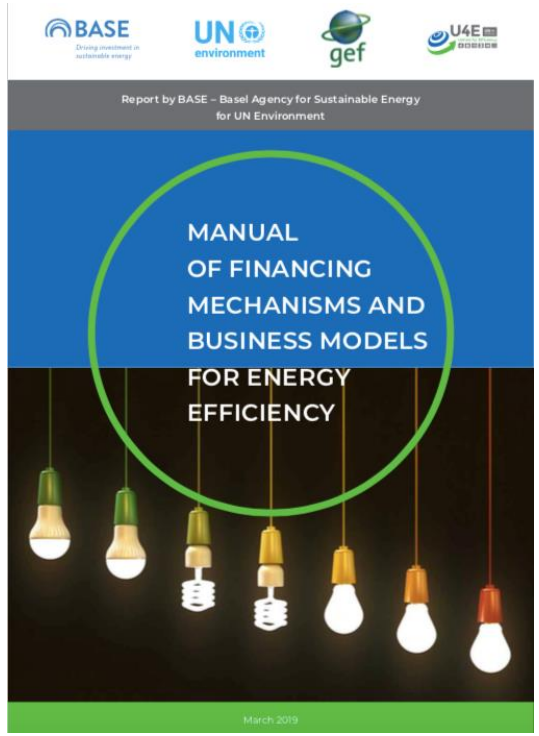
How to address higher first costs, risk, access to capital, & other barriers?

Sustainable Public Procurements

Product Registration System



Financial mechanisms



U4E Tools and Guidance: Overview

Resource: https://united4efficiency.org/resources/accelerating-global-adoption-energy-efficient-climate-friendly-refrigerators/
https://united4efficiency.org/resources/accelerating-global-adoption-energy-efficient-air-conditioners/

Cooling- an Indispensable need in ASEAN

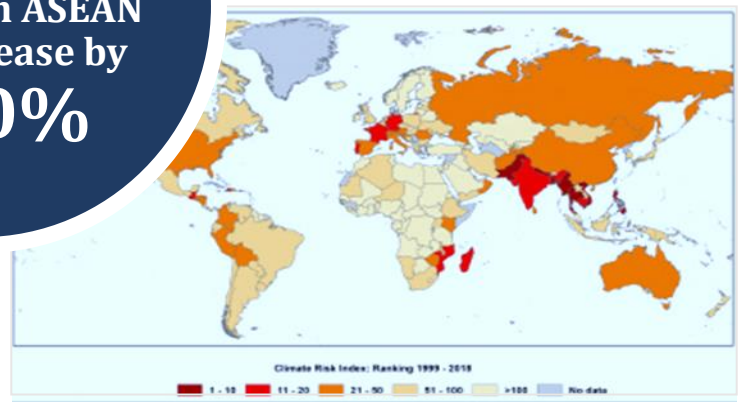
Overview

POPULATION GROWTH
ASEAN population accounts to 9% of world's population with an annual growth rate of 1.3%[1]

INCOME GROWTH
ASEAN's economy grew steadily, with an average annual growth of 5.7% and GDP/capita of about 5% allowing new air conditioner consumers[1]

By 2040[2], Air conditioners electricity demand in ASEAN will increase by 130%

URBANIZATION
51% of ASEAN population lives in urban environments, worsening heat island effects



RISING TEMPERATURES
Global average temperatures expected to rise over 2.0°C by 2100, making summers longer and hotter

Source: 1. ASEAN Key Figures 2020; 2. ASEAN Regional Savings Assessment (U4E 2021) GLOBAL CLIMATE RISK INDEX 2021.,Germanwatch.

Energy Efficiency: Pivotal enabler for Development & Climate Commitment in ASEAN

Global Renewables and Energy Efficiency Pledge

To triple the world's renewable energy generation capacity and double the global average annual rate of energy efficiency by 2030

Global Cooling Pledge

To reduce cooling related emissions by 68% by 2050

To significantly increase access to sustainable cooling by 2030

EE Opportunities under Montreal Protocol

Decision 28/3 under **Montreal Protocol** recognizes enhancing Energy efficiency during refrigerant transition offers several co-benefits.

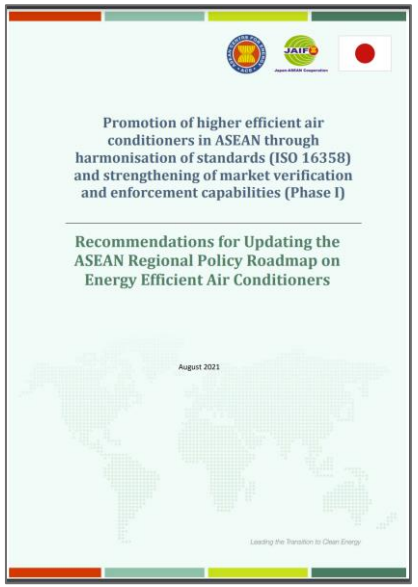
Net Zero Energy Targets

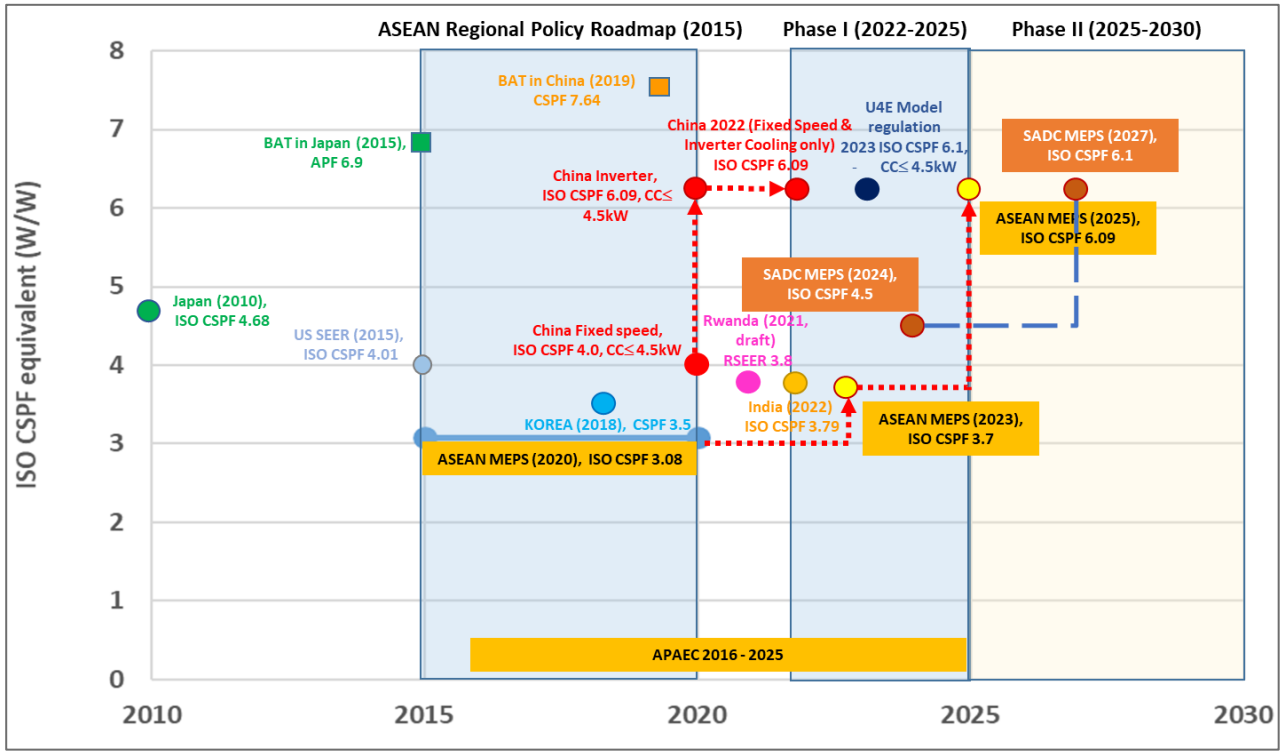
Most of the AMS are planning to go carbon neutral by 2050

All AMS have committed to (un)conditional carbon mitigation in their NDCs

ASEAN Regional Policy Roadmap for Air Conditioners

Overview

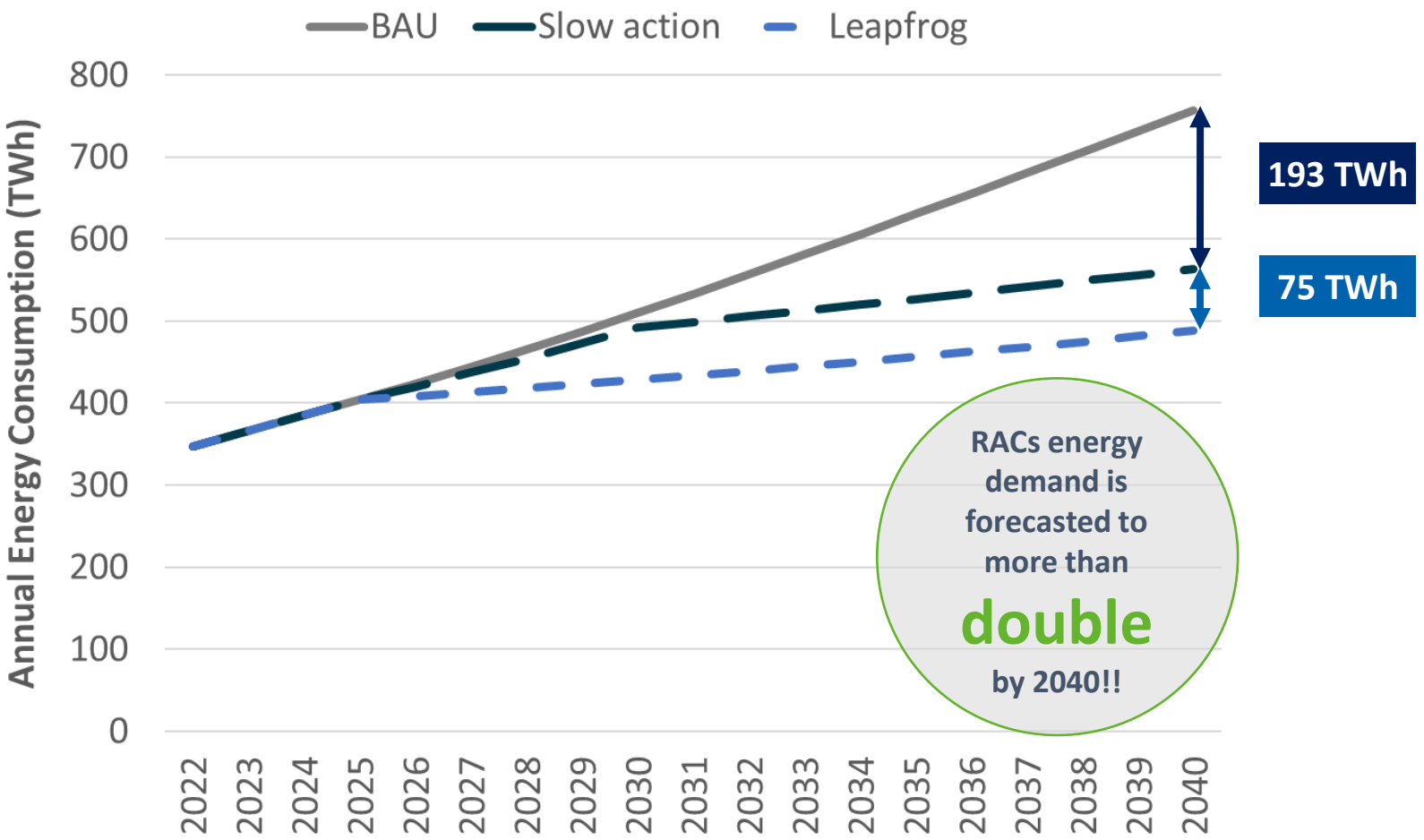




Harmonizing air conditioning standards in ASEAN with CSPF 3.08 by 2020 per the 33rd ASEAN Ministers on Energy Meeting in Malaysia, 2015.

Updating the ASEAN regional policy roadmap by 2025 by Implementing a phase-step approach was recommended in 2021

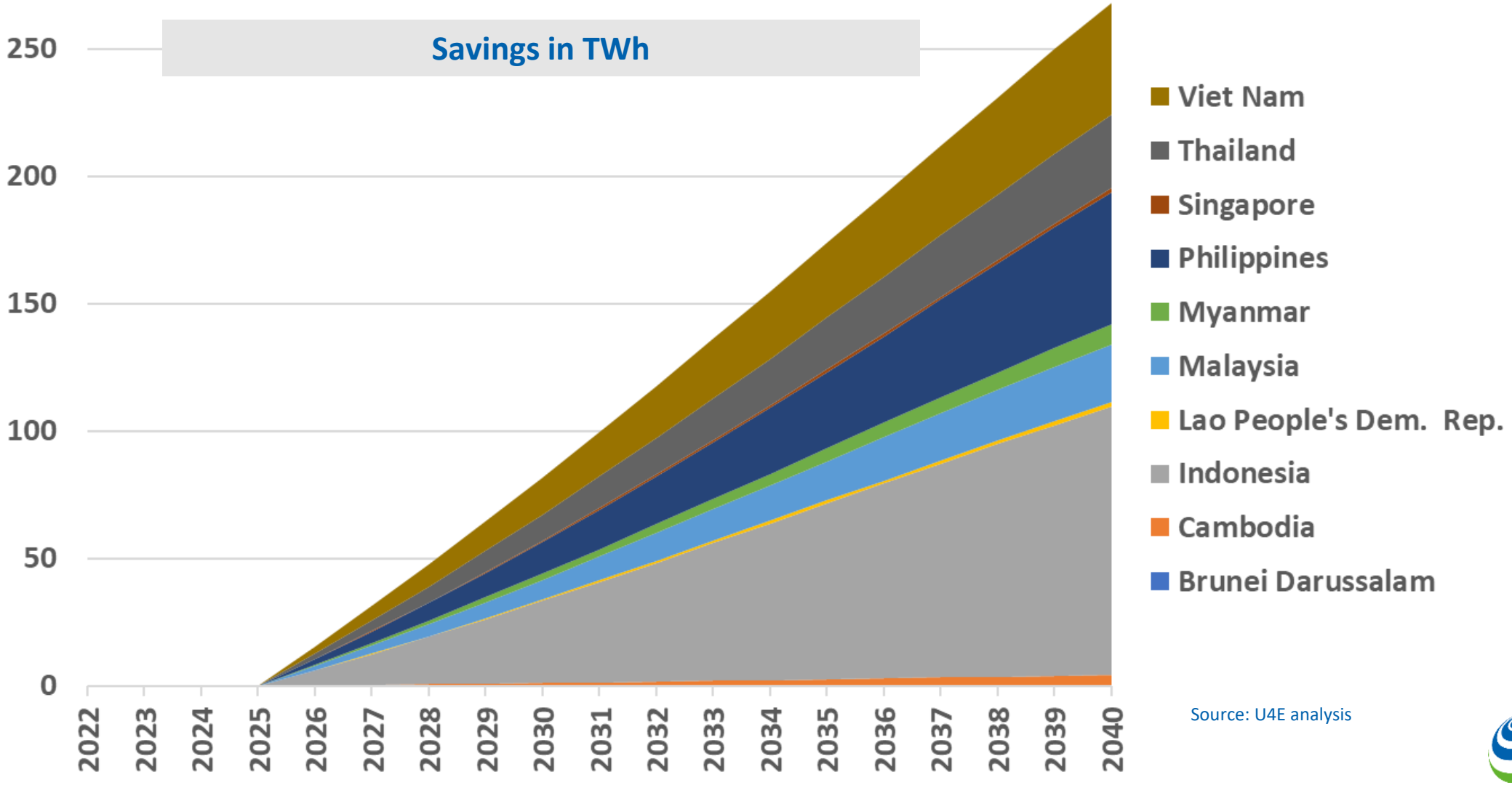
Saving Opportunities in ASEAN from Energy Efficient Room Air Conditioners



193[1]	151	$ 23	88+
1181	930	138	
268[2]	209	$ 32	122+
2077	1600	$ 23	
TWh	MtCO2e	Billion in electricity bill savings	Power stations [500 MW]

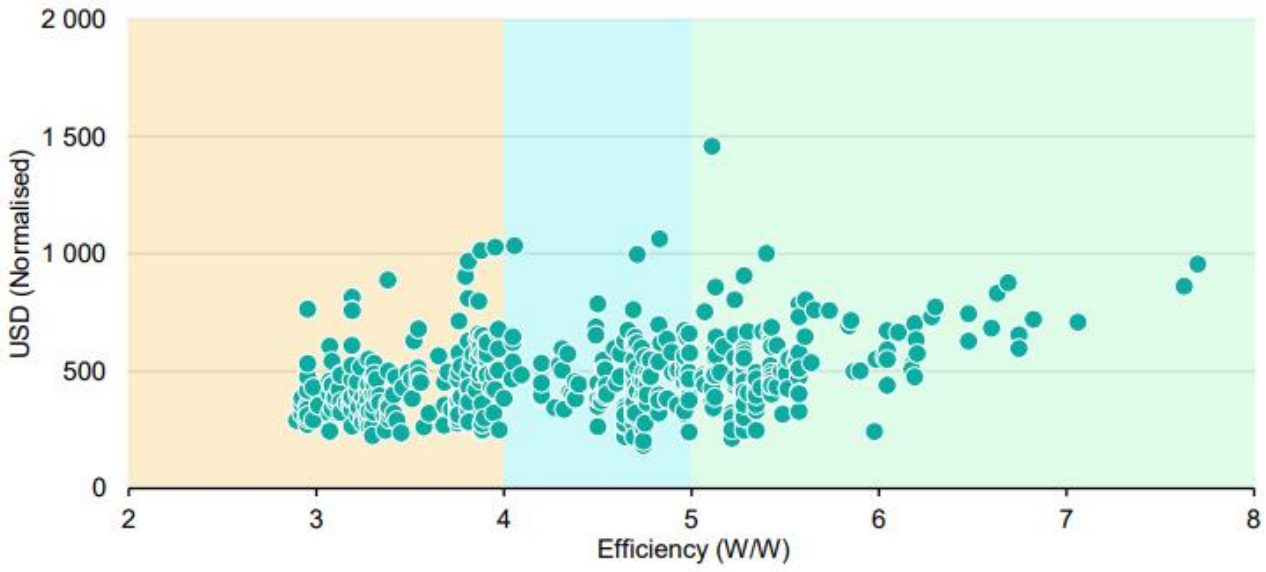
Annual Savings of room air conditioners in all 10 ASEAN Member states per various level of implementation of regional policy roadmap in 2040
1 Slow Action Scenario; 2 Leapfrog Scenario; Values represent Cumulative savings
Source: U4E analysis

Electricity Savings in ASEAN from Energy-Efficient Room Air Conditioners per Leapfrog Scenario

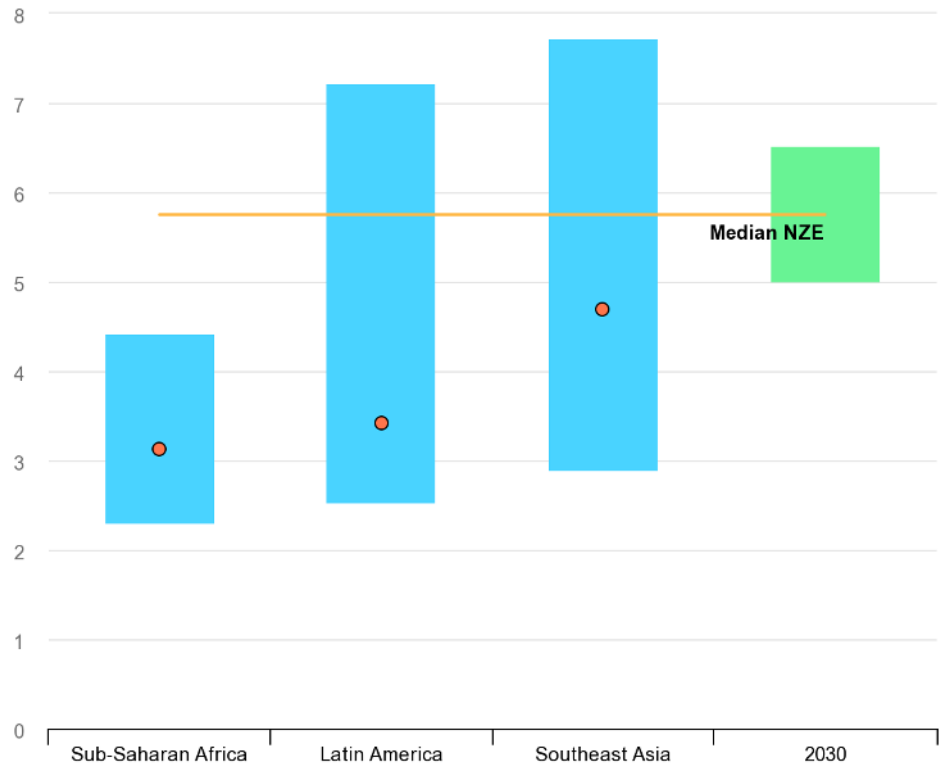


Source: U4E analysis

ASEAN Air conditioners: Performance and Price Mapping



With a budget of USD 350-500, consumers can choose between a low-efficiency unit at 3 W/W and one that is double as efficient (6 W/W)

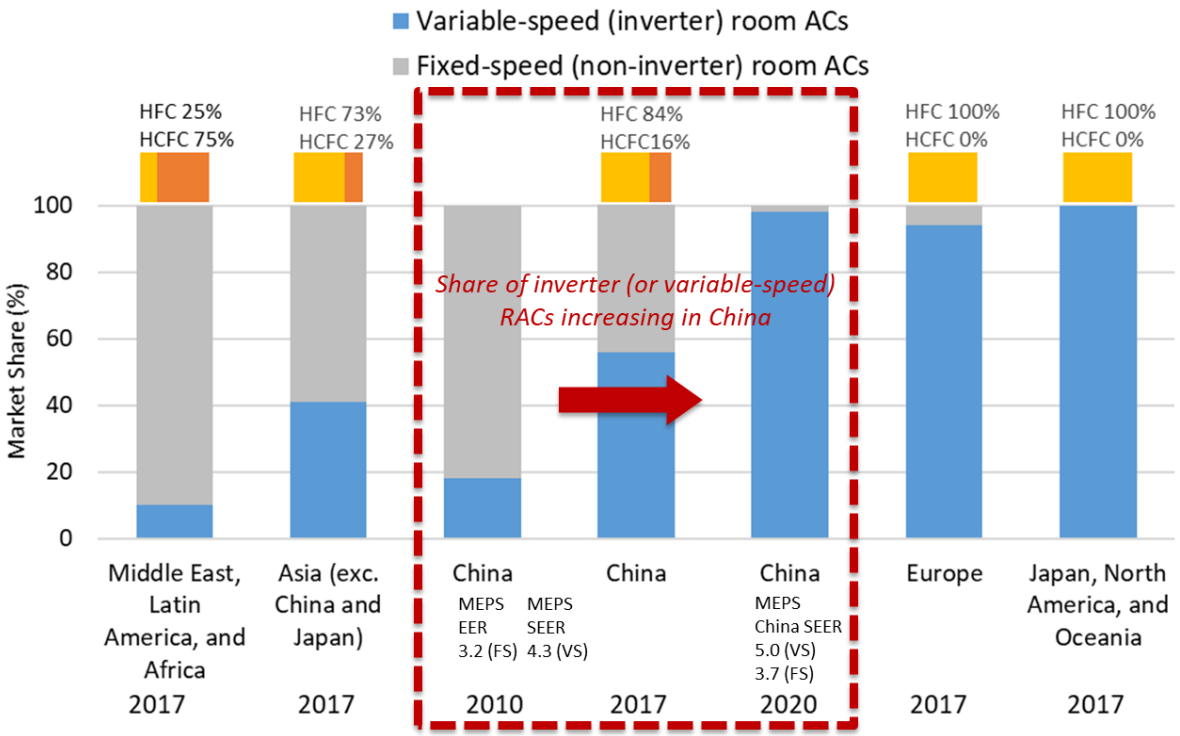


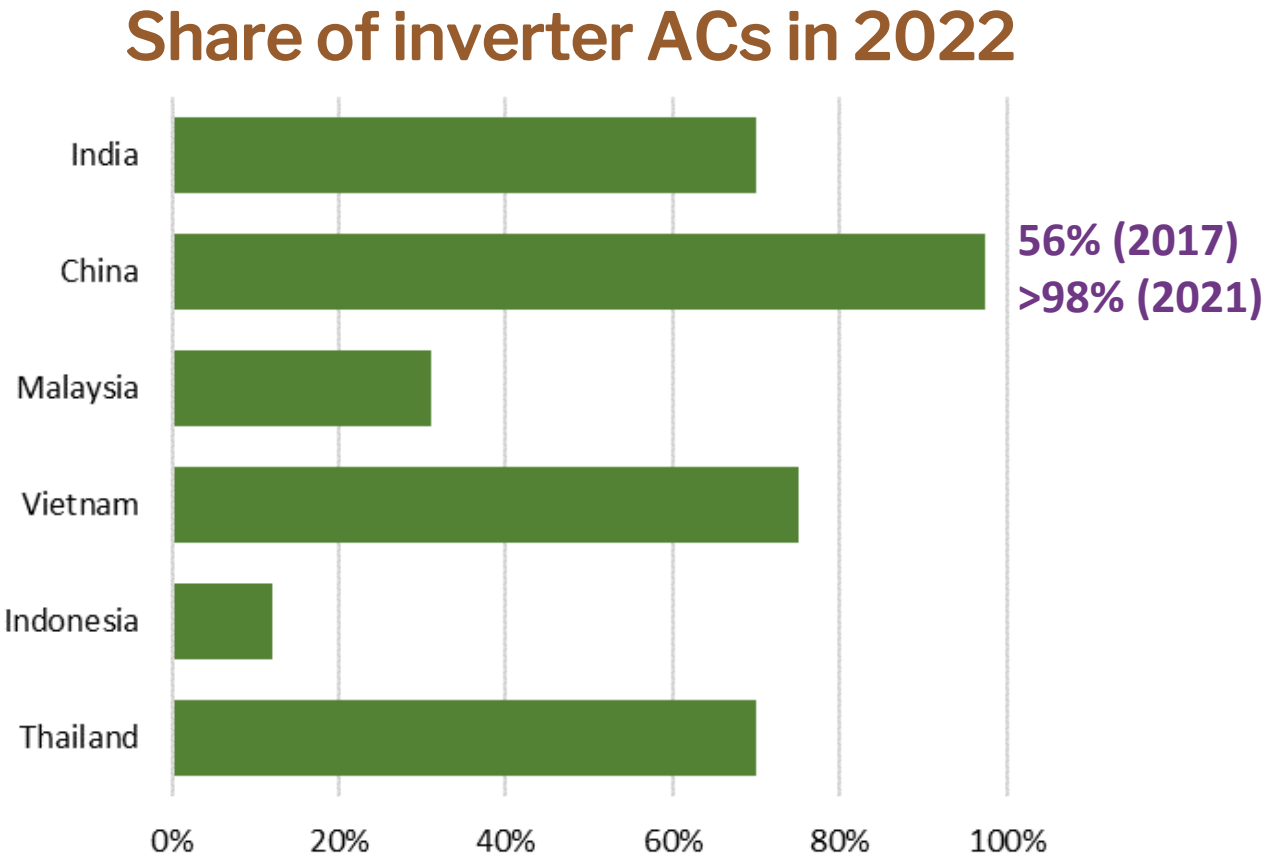
The best available technology for air conditioners in ASEAN is almost 2x the average efficiency available in the market and above 2.5x the least efficiency

*Source: IEA (2023): Air conditioners' efficiency rating and retail prices in Southeast Asia; link

Inverter Technology: Penetration Globally and in ASEAN

After implementing new MEPS in China (in 2020), Inverter ACs accounted for (>98%) in 2022!!





Source: BSRIA Split air conditioner reports

ASEAN Cool Initiative

Primary Objective

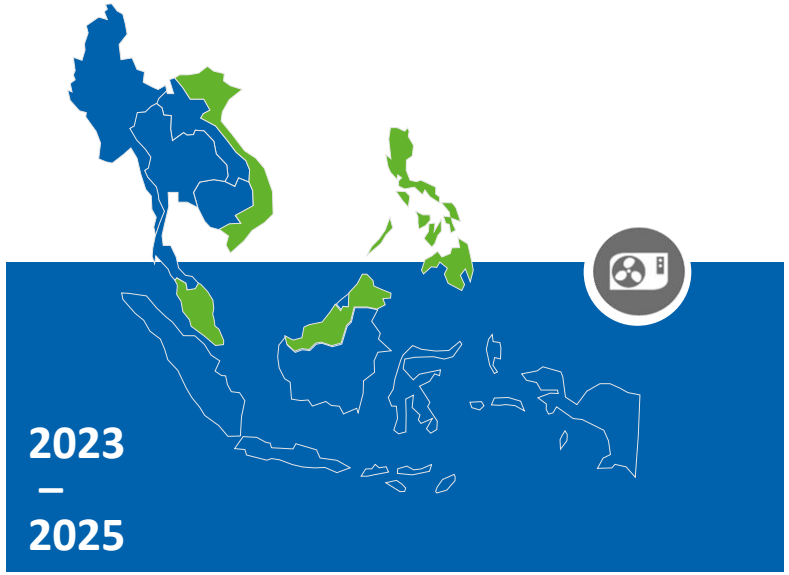
Accelerating the implementation of Regional Policy Roadmap **MEPS recommendations** and update of **labels for air conditioners**

Key components

- Market and policy assessment
- Regulations and implementation of MEPS aligned with the regional MEPS and low-GWP refrigerants
- Coordinated exchange with ASEAN AC stakeholders on ambitious AC MEPS Support the national enforcement of enhanced AC S&L frameworks through increased testing capacities + raise awareness

Regional Level Activities:

- Regional savings analysis; Awareness and dissemination activities including two regional workshops and other regional collaboration and outreach efforts



Country	Malaysia	Philippines	Singapore	Vietnam
Government Agency	Energy Commission	Department of Energy	National Environmental Agency	Ministries of Science and Technology; Industry & Trade

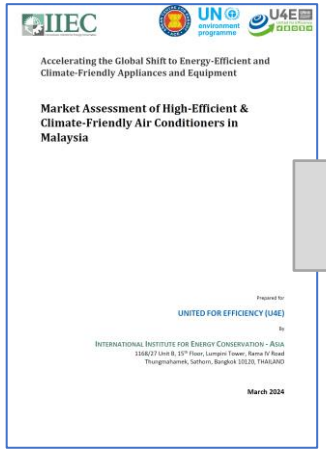
The project is funded by Clean Cooling Collaborative- philanthropic initiative of ClimateWorks Foundation

Donors: Clean Cooling COLLABORATIVE

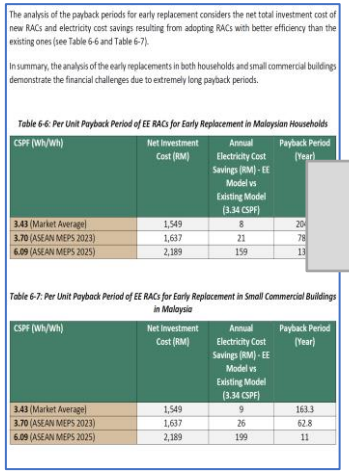
Partners: U4E United for Efficiency, giz, ASEAN CENTRE FOR ENERGY ACE, BERKELEY LAB, IIEC, U4E United for Efficiency

ASEAN Cool Initiative: Malaysia & Singapore

Recent Deliverables



Market Assessment



The analysis of the payback periods for early replacement considers the net total investment cost of new RACs and electricity cost savings resulting from adopting RACs with better efficiency than the existing ones (see Table 6-6 and Table 6-7).

In summary, the analysis of the early replacements in both households and small commercial buildings demonstrate the financial challenges due to extremely long payback periods.

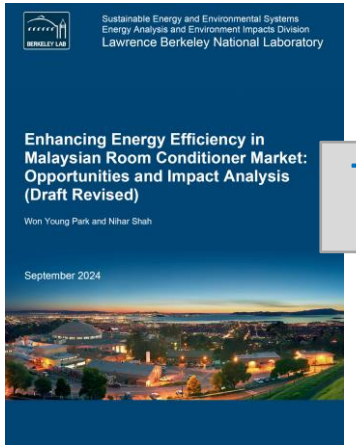
Table 6-6: Per Unit Payback Period of EE RACs for Early Replacement in Malaysian Households

CSPF (Wh/Wh)	Net Investment Cost (RM)	Annual Electricity Cost Savings (RM) - EE Model vs Existing Model (3.34 CSPF)	Payback Period (Year)
3.43 (Market Average)	1,549	8	20
3.70 (ASEAN MEPS 2023)	1,637	21	78
6.09 (ASEAN MEPS 2025)	2,189	159	13

Table 6-7: Per Unit Payback Period of EE RACs for Early Replacement in Small Commercial Buildings in Malaysia

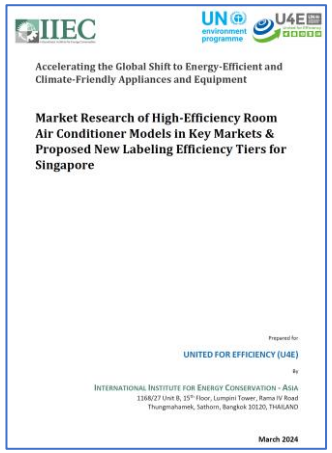
CSPF (Wh/Wh)	Net Investment Cost (RM)	Annual Electricity Cost Savings (RM) - EE Model vs Existing Model (3.34 CSPF)	Payback Period (Year)
3.43 (Market Average)	1,549	9	163.3
3.70 (ASEAN MEPS 2023)	1,637	26	62.8
6.09 (ASEAN MEPS 2025)	2,189	199	11

Cost- benefit Analysis



Techno-economic Assessment

Recent Deliverables



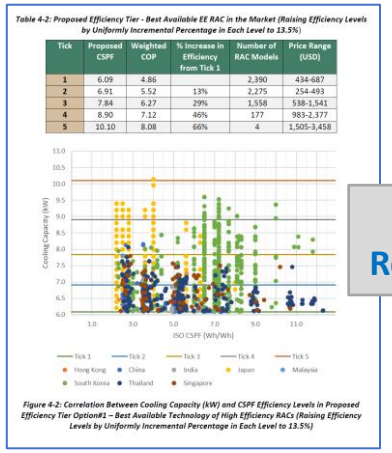


Table 4-2: Proposed Efficiency Tier - Best Available EE RAC in the Market (Raising Efficiency Levels by Uniformly Incremental Percentage in Each Level to 13.5%)

Tick	Proposed CSPF	Weighted COP	% Increase in Efficiency from Tick 1	Number of RAC Models	Price Range (USD)
1	6.09	4.86		2,390	434-687
2	6.91	5.52	13%	2,275	254-493
3	7.84	6.27	29%	1,558	538-1,541
4	8.90	7.12	46%	177	983-2,377
5	10.10	8.08	66%	4	1,505-3,458

Figure 4-2: Correlation Between Cooling Capacity (kW) and CSPF Efficiency Levels in Proposed Efficiency Tier Option#1 – Best Available Technology of High Efficiency RACs (Raising Efficiency Levels by Uniformly Incremental Percentage in Each Level to 13.5%)

Labelling Recommendations

Recommendations on Financial Incentives

First Regional Workshop– ASEAN Cool Initiative

To build coordination and collaboration, share knowledge and experiences and raise awareness amongst the ASEAN member states and organizations to progress toward the regional MEPS for room air conditioners

Held during **14-15 November 2023 in Johor Bahru**, Malaysia.
40+ participants from various AMS (line) Ministries, International Organizations, think tanks, NGOs

Donors/Organizers :

ASEAN Cool Initiative: Singapore Study Tour

Overarching Aim

- Explore the regulatory framework on MEPS implementation in Singapore.
- Gain knowledge on monitoring, verification, and enforcement mechanisms related to MEPS in Singapore.

Expected Outcomes

- Enhanced understanding of MEPS implementation strategies and its regulatory frameworks.
- Identification of best practices in monitoring, verification and enforcement mechanisms.
- Exploration of Mutual recognition agreements (MRA) for RAC testing in ASEAN to strengthen regional collaboration.

BCA Skylab

Thank You

TRANSFORMING MARKETS TO ENERGY-EFFICIENT PRODUCTS

PHONE

+33 1 44 37 19 86

EMAIL

unep-u4e@un.org

WEBSITE

united4efficiency.org