



Evaluating Policy Impacts: Indonesia's Experience in Energy Efficient Appliances

CLASP is supporting appliance energy efficiency in **11 of the top 20 carbon emitting economies in the appliances sector**

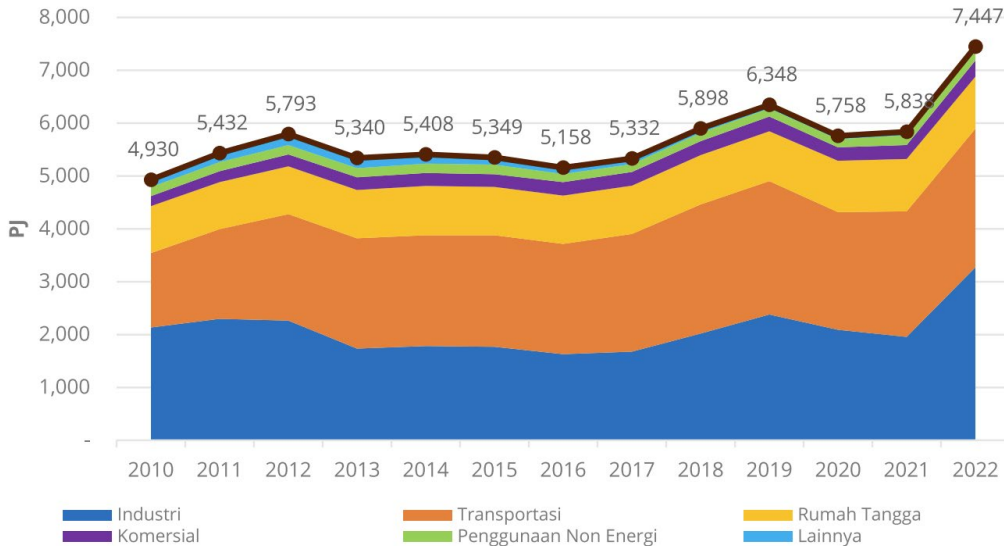


Table 1. Appliance Energy Efficiency Potential – Based on Business-as-Usual CO₂ Emissions 2025-2040

Priority	Country	Mt CO ₂ 2025-2040
1	China	39,564
2	EU-27	29,265
3	India	26,754
4	USA	20,260
5	Japan	10,306
6	Russian Federation	5,245
7	Indonesia	4,486
8	Canada	4,110
9	United Kingdom	4,101
10	Republic of Korea	3,668
11	Turkey	3,518
12	Mexico	3,043
13	Saudi Arabia	2,747
14	Iran	2,730
15	Brazil	2,633
16	Ukraine	2,376
17	South Africa	2,112
18	Thailand	1,561
19	Egypt	1,484
20	Kazakhstan	1,389

Indonesia's Energy Demand Landscape

Total Final Energy Consumption



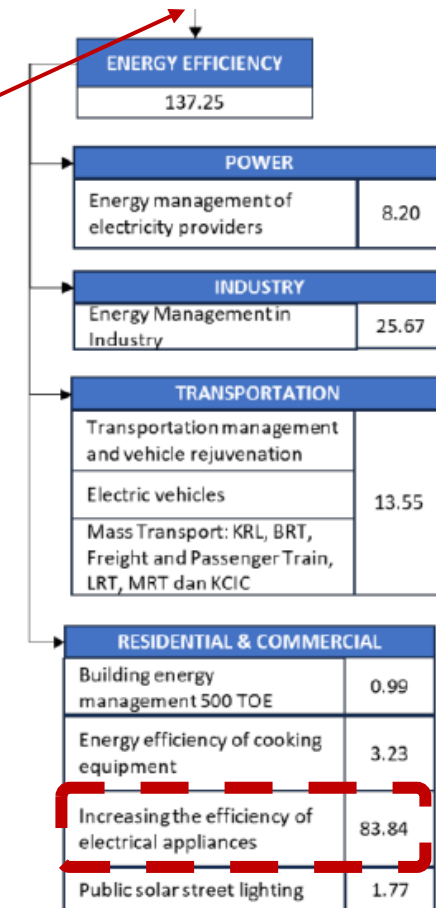
Source: Handbook of Energy and Economic Statistic Indonesia (HEESI), MEMR, 2022.

- Energy demand Increase of ~22% from previous year.
- **Residential sector** is the 3rd largest demand (13.3%)
- **Electricity (13%)** is 3rd largest fuel type after fossil fuel (56%) and natural gas (14%).

ENHANCED NDC 2030

No	Sektor	Emisi GRK 2010 (Juta Ton CO ₂ e)	Emisi GRK pada 2030			Penurunan Emisi	
			BaU	CM1	CM2	CM1	CM2
1.	Energi	453,2	1.669	1.311	1.223	358	446
2.	Limbah	88	296	256	253	40	45,3
3.	IPPU	36	70	63	61	7	9
4.	Pertanian	111	120	110	108	10	12
5.	Kehutanan	647	714	217	-15	500	729
TOTAL		1.334	2.869	1.953	1.632	915	1.240

- **Energy efficiency** is one of the five main strategies (**contribution of 38%**) that will support achieving the energy sector's emission reduction commitment of 358 MTCO₂eq by 2030
- **Appliance efficiency** contributes the highest in energy efficiency mitigation, with **83.84 MTCO₂eq (23% contribution in energy sector)**.



EE Appliances – 10 Years of Implementation



The Directorate-General of New Renewable Energy and Energy Conservation (EBTKE) **was established on 24th August 2010, under MEMR**



First **energy labelling** was introduced for lighting products

New Government Regulation as the **umbrella for MEPS and Labelling policy (Ministry Decree)**

Permen ESDM Nomor 14 Tahun 2021

2 new MEPS and Labelling introduced in **2023** for:

1. RDC Showcase (beverage cooler)
2. Television

And **phasing-out star-1 MEPS** for ACs

2010

2011

2014

2015

2021

>2023

First appliance standard introduced in April 2011, for **self-ballast lighting products**

Both **mandatory MEPS** and **Labeling program** launched for RACs



4 new appliances are introduced with MEPS and Labelling:

1. Refrigerator
2. Electric Fans
3. Rice Cooker
4. LED

And **AC MEPS revision**, EER to CSPF metric

New MEPS and Labelling introduced in **2025** for:

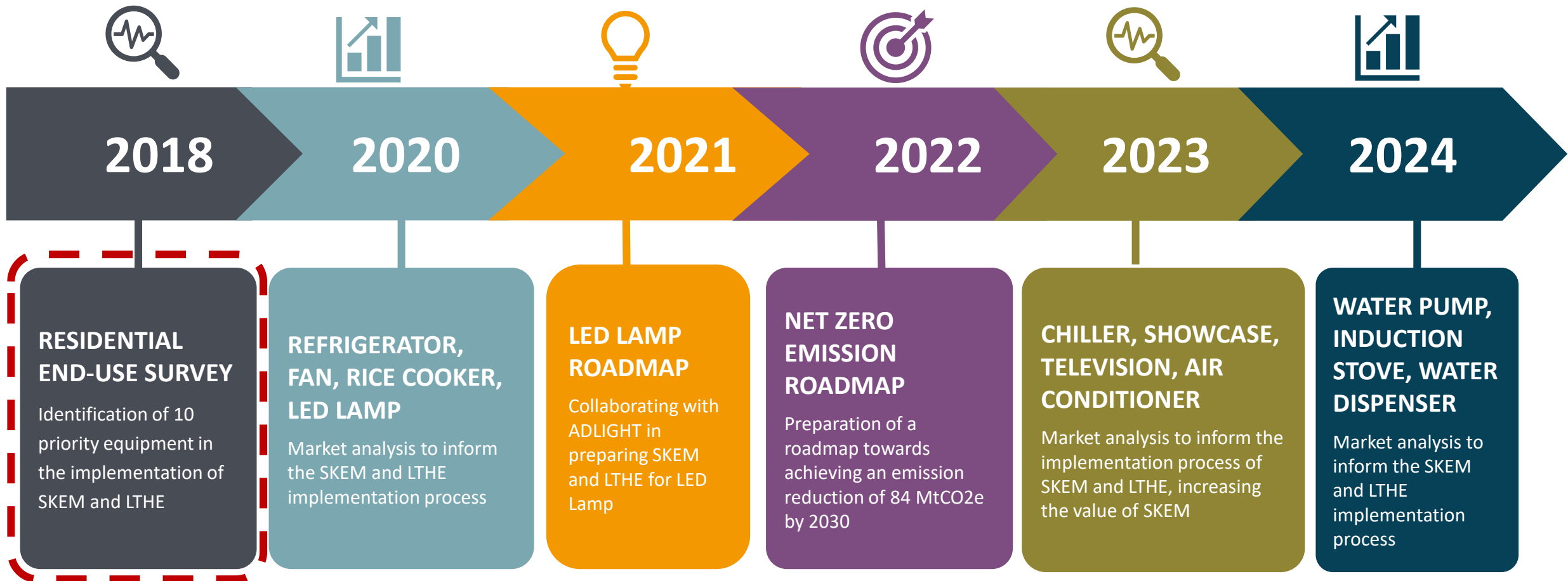
1. Water Dispenser
1. Water Pump



Our Work Journey in Indonesia

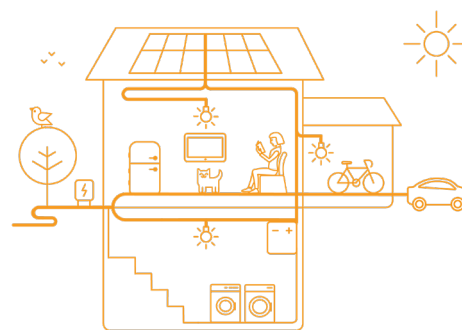
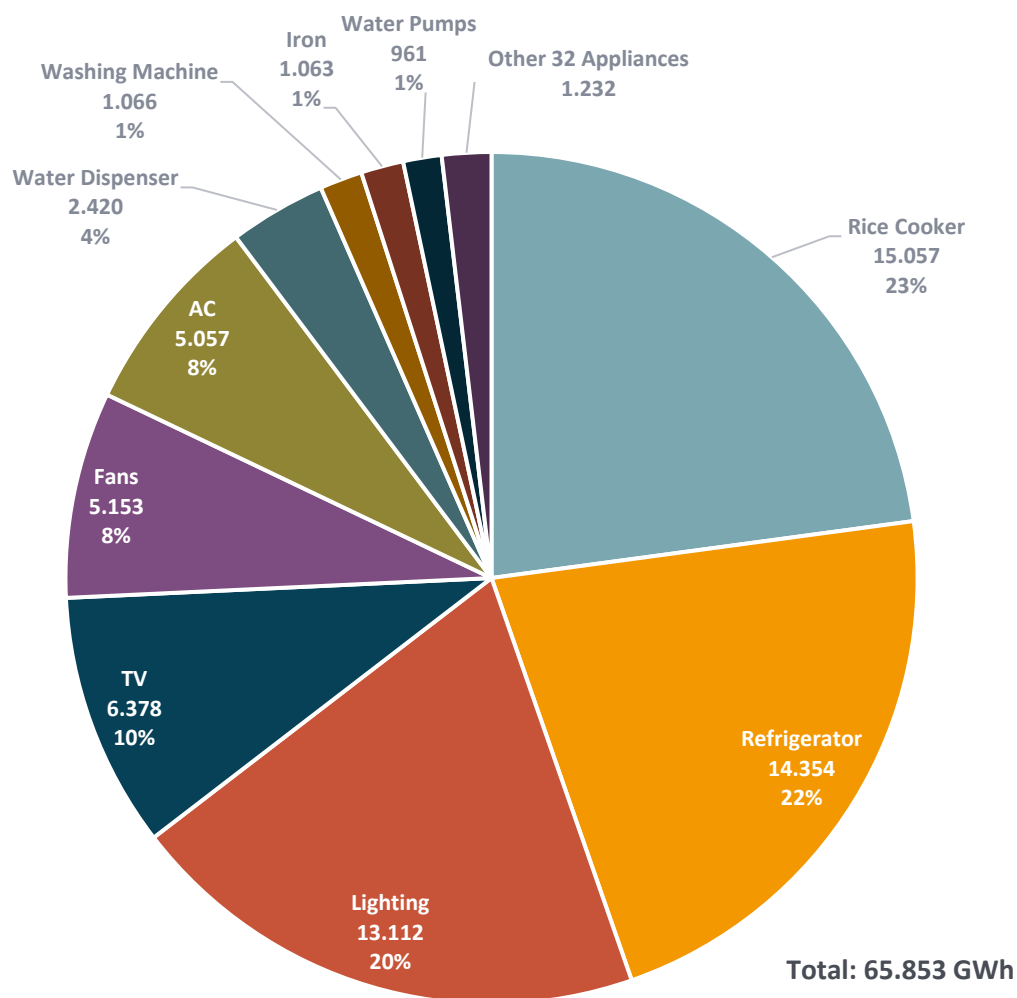


Through our support, Indonesia had set 8 appliance policies that will potentially contribute to a cumulative reduction of ~100 MTCO₂eq emissions by 2030.



Indonesia's Residential End - Use Survey

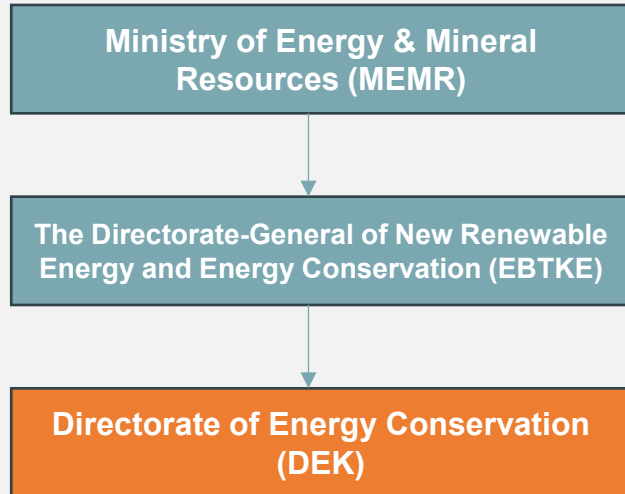
Estimated Appliances Energy Consumption Profile
in Residential Sector (GWh)



- In 2018 conducted 5,443-household residential end-use survey across Indonesia to provide energy consumption baseline and inform future policy.
- Identify **top 10 appliances with highest energy consumption** → prioritization for S&L development.
- **Awareness on energy efficiency:**
 - Respondents 3 main factors in purchasing decisions are **affordability (price), brand, and energy saving.**
 - Only **6.5% of respondents were aware** of the labeling
 - **94% of respondents were able to interpret the energy label correctly.**

Indonesia S&L Program Structure

Coordinating/Implementing Ministry

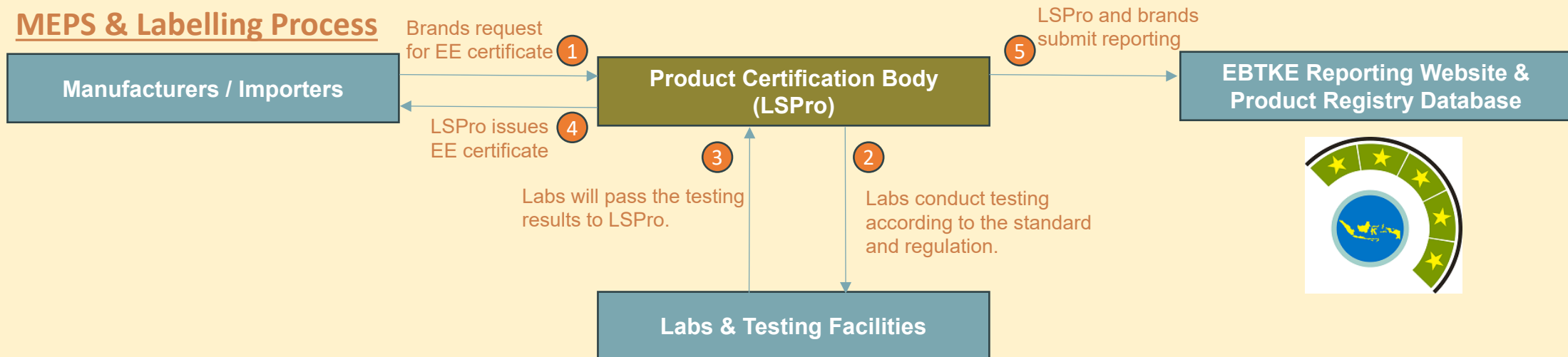


Regulatory Framework

All S&L regulations are developed and implemented by MEMR, under these regulations:

- **Peraturan Pemerintah Nomor 33 Tahun 2023 tentang Konservasi Energi**
→ Overarching umbrella for MEPS and Labelling regulation.
- **Permen ESDM Nomor 14 Tahun 2021 tentang Penerapan Standar Kinerja Energi Minimum (SKEM) untuk Peralatan Pemanfaat Energi**
→ More specific details on how MEPS and Labelling regulations work.

MEPS & Labelling Process



Case Study – RAC MEPS Policy

- S&L policies are **often reviewed 2 – 3 years** after the regulation is effectively implemented
 - 1 year grace period from policy effective date
 - 1 – 2 years to review the market condition
- In the case for ACs, the experience and current journey:
 - **Policy started in 2015 → EER metric**
 - **Revision 2021 → ASEAN Harmonization, CSPF metric**
 - **Revision 2023 → Phase-out Star-1, MEPS at Star-2**
 - **Plan for review current policy in 2026**
 - **2026 – 2027 Next AC Policy Revision**

AC MEPS in 2015

☆	☆☆	☆☆☆	☆☆☆☆
$8,53 \leq \text{EER} < 9,01$	$9,01 \leq \text{EER} < 9,96$	$9,96 \leq \text{EER} < 10,41$	$10,41 \leq \text{EER}$

AC MEPS in 2021

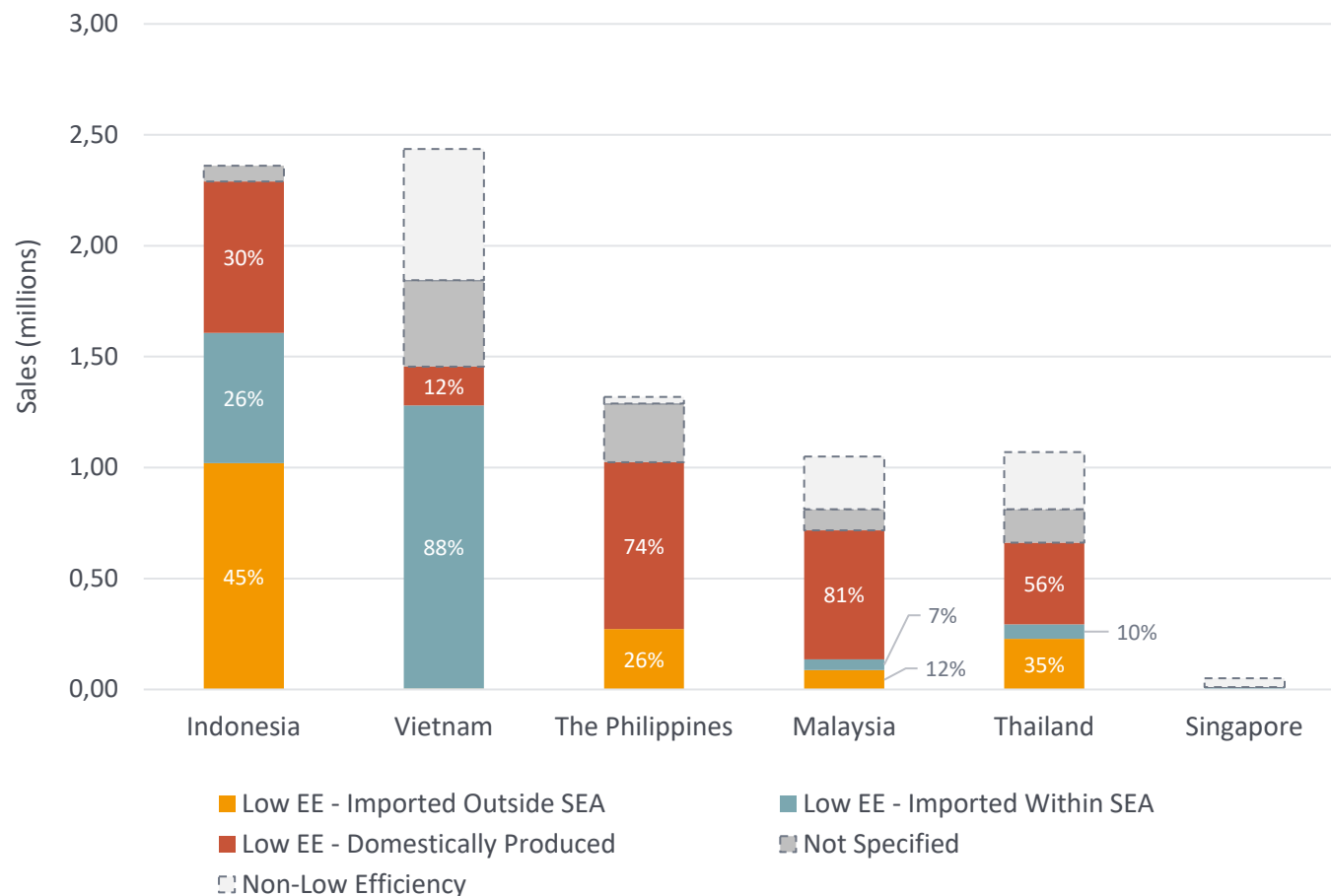
Jumlah Bintang	Nilai Efisiensi (W/W)
☆	$3,10 \leq \text{CSPF} < 3,40$
☆☆	$3,40 \leq \text{CSPF} < 3,80$
☆☆☆	$3,80 \leq \text{CSPF} < 4,20$
☆☆☆☆	$4,20 \leq \text{CSPF} < 5,00$
☆☆☆☆☆	$5,00 \leq \text{CSPF}$

AC MEPS in 2023

Level Bintang	Nilai Efisiensi (Wh/Wh)
★★	$3,40 \leq \text{CSPF} < 3,80$
★★★	$3,80 \leq \text{CSPF} < 4,20$
★★★★	$4,20 \leq \text{CSPF} < 5,00$
★★★★★	$5,00 \leq \text{CSPF}$

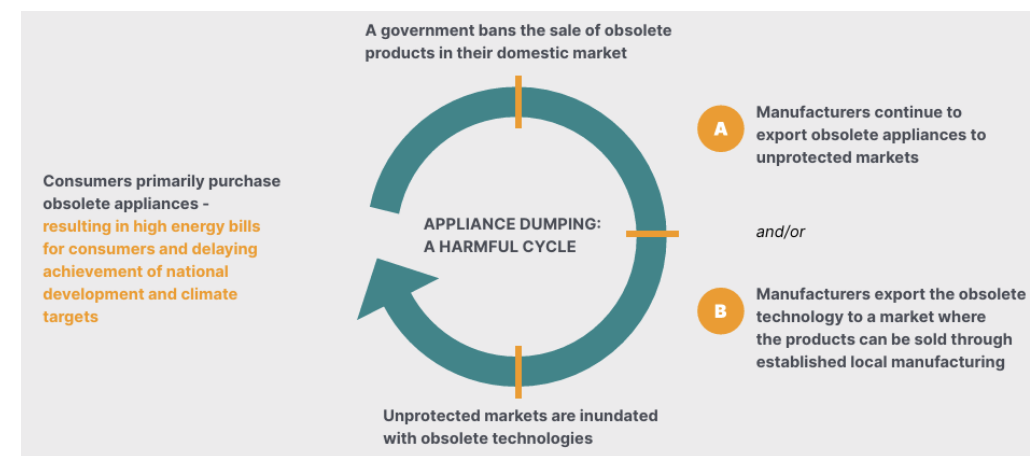
Case Study – RAC MEPS Policy (SEA Dumping Study)

Sales of Inefficient AC by Country



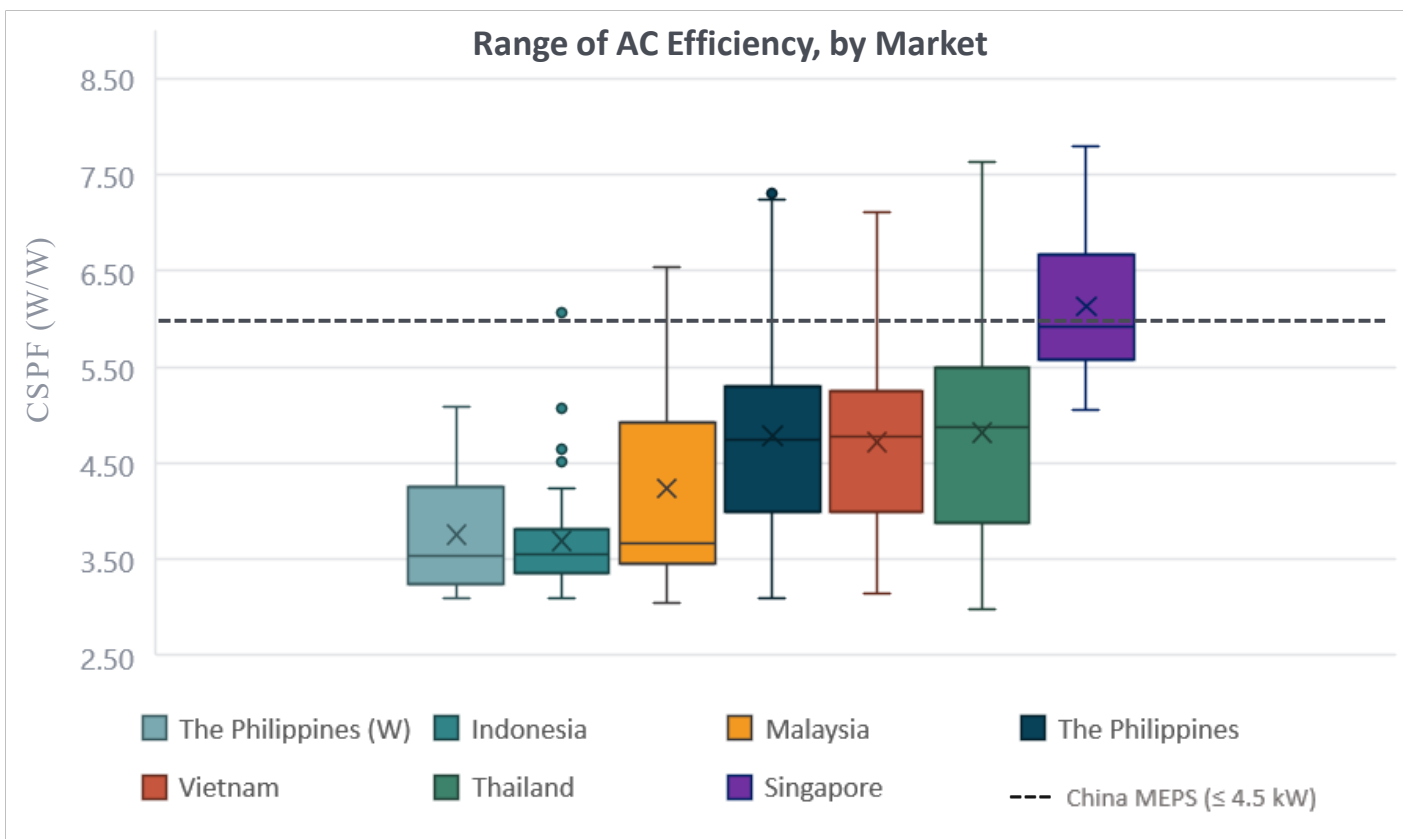
Note: the data in this chart represents approximately 88% of the market or 7.3 million units (out of a total of 8.3 million units).

- In 2023, CLASP published Southeast Asia Dumping Study Report on Air Conditioner, to showcase the effects of manufacturers continuing to export/sell obsolete products to unprotected markets (markets with lower MEPS).



- An **estimated 6.2 million inefficient AC units** were sold in 2021 (**74% of total sales** across Southeast Asia), with distribution as shown in the adjacent chart.
- 71% of inefficient AC** sales were **produced within Southeast Asia**, primarily by multinational companies.
- 29% were imported from outside** the Southeast Asian region.

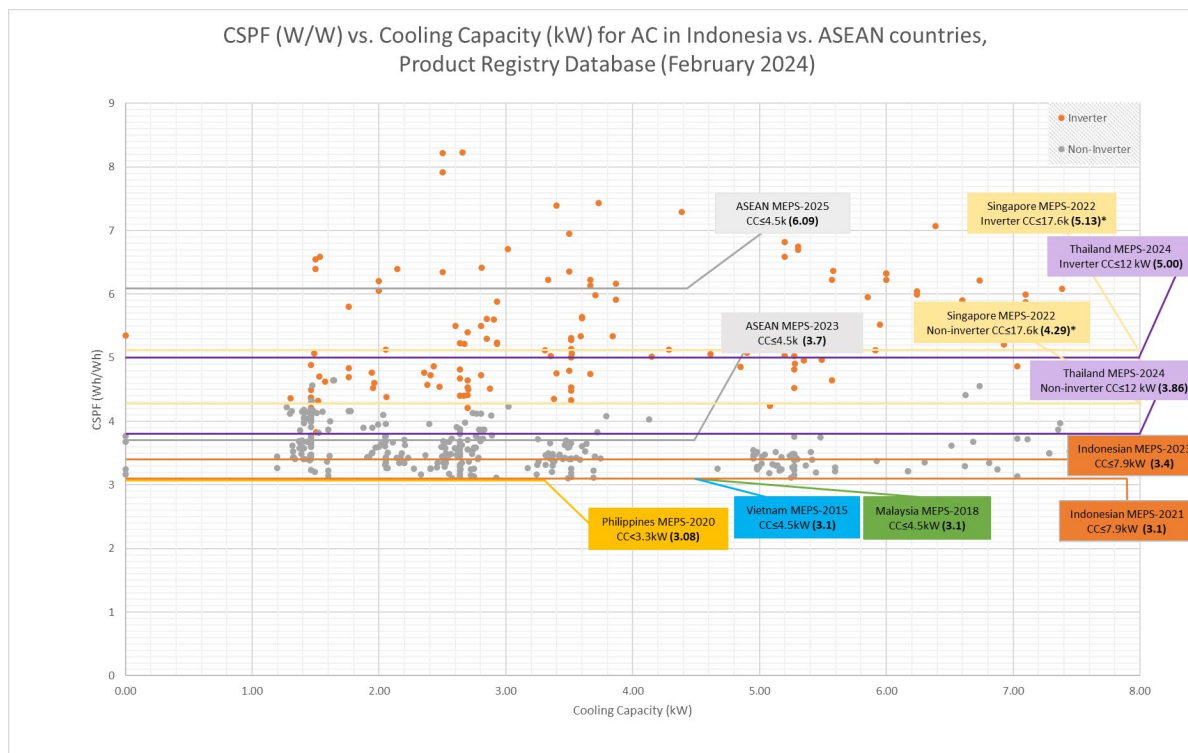
Case Study – RAC MEPS Policy (SEA Dumping Study)



"Threshold Low efficiency": below China's MEPS (inverter) CSPF 6.1 W/W (capacity ≤ 4.5 kW)

- China's MEPS was chosen due to high export levels and alignment with U4E industry targets and ASEAN Regional Harmonization MEPS 2025 targets.
- Overall, efficiency values range from **CSPF 2.97–7.80 W/W**.
- **Median Efficiency by Sales:**
 - Overall: CSPF 4.18 W/W
 - Philippines (window RAC),
 - **Indonesia & Malaysia: ~CSPF 3.60 W/W**
 - Philippines, Vietnam, Thailand: ~CSPF 4.80 W/W
 - Singapore: CSPF 5.93 W/W
- Many locally produced AC units have efficiency levels at or below ASEAN MEPS 2023 (CSPF 3.7 W/W).
- **First RAC revision in 2023** was finalized through thorough market condition review, public consultation, and additional studies such as the dumping study

Case Study – RAC MEPS Policy (AC Comparative Test)



• RAC Market Condition in 2024:

- Annual RAC sales still dominated by fixed speed AC, with **inverters only 15% of market share.**
- **40% of AC models registered in star-4 and star-5 (4.20> CSPF)**, increase from **21% previously in 2023** before revision.
- **44% of AC models registered** available in the market are at **star-2 (3.40 – 3.80 CSPF)**

Star Rating	Indonesia (2023)	Malaysia (2026) ^a	Thailand Fixed-Speed (2024) ^b	Thailand Inverter (2024) ^b	Philippines (2024)
CSPF (W/W)					
*	-	< 4,1	3,9	5,0	3,3
**	3,4	4,1	4,0	5,4	4,1
***	3,8	4,8	4,2	5,9	4,7
****	4,2	5,4	4,3	6,3	5,1
*****	5	6,09	4,5	6,8	5,9
*****	-	-	4,6	7,2	-

^a Effective date from 01-01-2026

^b Thailand SEER = CSPF x 3,412 Btu/h/W

- Since 2023 AC revision in Indonesia, several neighboring ASEAN countries updated their AC MEPS in 2024 – 2026.
- Similar to previous round.. In order to prevent dumping, Indonesia **aims to review the current policy in 2026, with the goal of finalizing updated AC MEPS latest by 2027.**
- Several challenges in adopting inverters due to **widespread perception amongst stakeholders that inverters are ineffective** for operation in Indonesia.
 - Leaky construction/operational habits
 - Perceived lack of compatibility due to high RH%
 - Vulnerable to the main grid instability

Case Study – RAC MEPS Policy (AC Comparative Test)



Support from APITU (Association of AC Technicians) on installing the AC units in every testing site (Jakarta, Medan & Bali).

- Throughout 2025, **conduct real life comparative testing of fixed speed and inverter AC**, in 3 different cities to cover the climate range, and tested in landed and apartment site to cover the majority of household built environment condition.
- **Develop methodology with key stakeholders** in the AC business environment (brands, practitioners, building owners/managers, architect, technicians, associations, etc.) to gain confidence/buy in on the study.
- Partner with local (University of Indonesia) and international university (CEPT University, India) for implementation of the study.
- **Study to be concluded in Q1 2026**, but preliminary/initial findings are showing that **inverters show benefits (up to 25 – 30% lower consumption)**
- Study will provide additional input for MEMR during the review process in 2026 to **push for higher stringency**.

Challenges

- **Low electricity prices** slow down benefits/return on investment for consumers across sector
- **Low consumer awareness** of the benefits of MEPS & Labeling
- **Readiness and competitiveness of local manufacturing** in the appliance sector – competition w/ imported products, and market size
- Access gap: **consumer purchasing power** varies widely across Indonesia (due to economic disparities)
- **Quality of human resources** e.g., installation, operation and maintenance → **slowing down technology adoption**
- **Readiness and capability of testing laboratories** infrastructures

Opportunity

- **Studies to provide relevant data** to increase stakeholder confidence → e.g., supply chain, market transformation piloting, etc.
- Developing business models or financing mechanisms for **high-efficient adoption across sector**
- **Increasing government purchasing** of high energy efficiency equipment through pilot models, procurement guidelines, etc.
- **Supporting local manufacturing readiness and competitiveness** in the equipment sector (i.e., industry accelerators)
- **Better understanding on the trade environment** and interaction of trading partners of countries policies

Thank you!
Any questions?

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Efficient Appliances for People & the Planet

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