



Overview of IEA E4 cooling programmes in Asia

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6th IEA-Tsinghua joint workshop - 28th September 2020

IEA Energy Efficiency in Emerging Economies (E4) programme

Since 2014, the IEA has been supporting *Brazil, the People's Republic of China (China), India, Indonesia, Mexico and South Africa* to capture the benefits of energy efficiency through the E4 programme. E4 also works regionally with ASEAN, Latin America and increasingly Africa, supporting energy efficiency through established political and trading relationships.

Objective: support the design and implementation of more effective energy efficiency policies that help meet national and regional objectives for economic and social development.

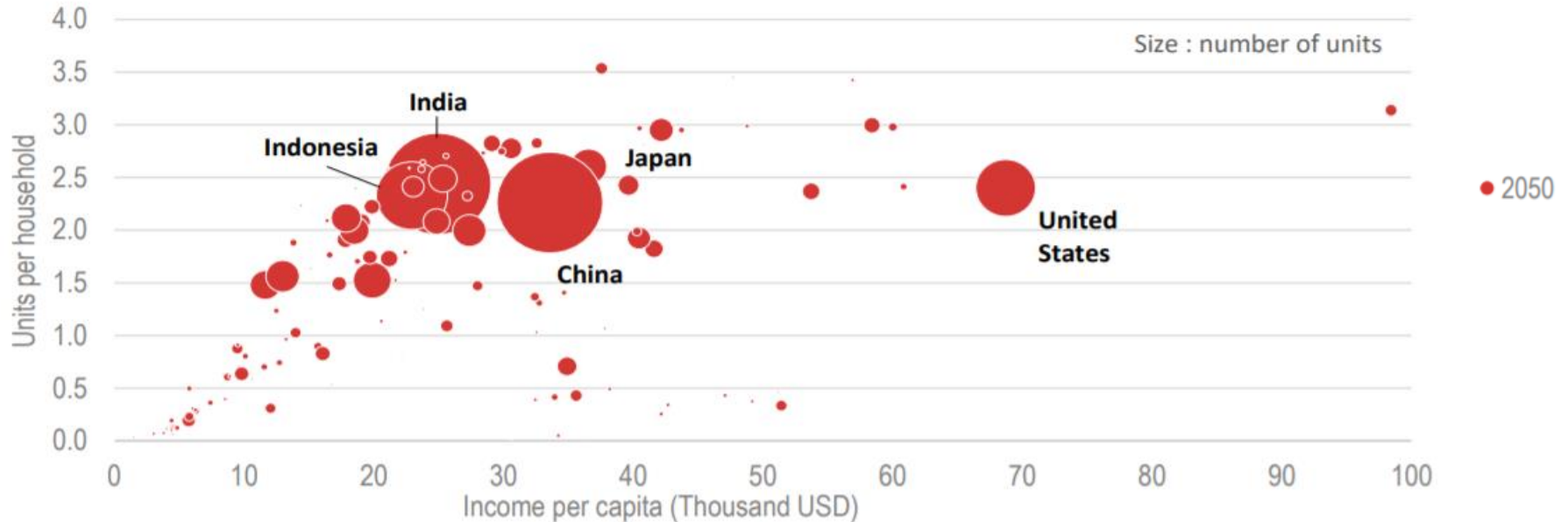
Collaboration is based on national and regional needs but falls into three main themes:

- understanding the potential for energy efficiency to enable a secure, sustainable energy supply
- supporting target setting and policy design to deliver energy efficient prosperity
- tracking progress through energy efficiency indicators and policy evaluation for continuous improvement.

E4 countries consume around one third of the world's energy and this proportion is set to grow

Increased interest and need for efficient cooling in Asia

Evolution of global air conditioner ownership



By 2050, around 2/3 of the world's households could have an air conditioner.
China, India and Indonesia will account for half of all AC units in buildings in 2050

E4's work on cooling in China

The **Future of Cooling in China**, developed as one of the implementation strategies for China's Cooling Action Plan, was launched in June 2019.

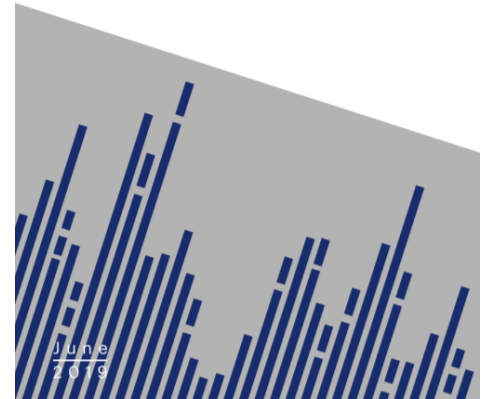
2nd Workshop on Cooling with Tsinghua Univ. held in China in Sep 2019.

Chinese experts participated in **International Workshop on Energy Efficient Cooling**, held in Delhi on 12-13 December 2019.

An analysis on **retrofit of cooling system** planned for early 2021.

The Future of Cooling in China

Delivering on action plans for sustainable air conditioning



E4's work on cooling in ASEAN

The **ASEAN-IEA Cooling Partnership** was formed as part of Thailand's 2019 ASEAN Presidency, culminating in **The Future of Cooling in Southeast Asia** report.

The IEA also organised various cooling events within the region including a side event at the **Asia Clean Energy Forum** in July 2019.

Continuing to expand **analysis on cooling in the region** and recently completed a retail market survey for ACs and refrigerators using crowd-sourced data.

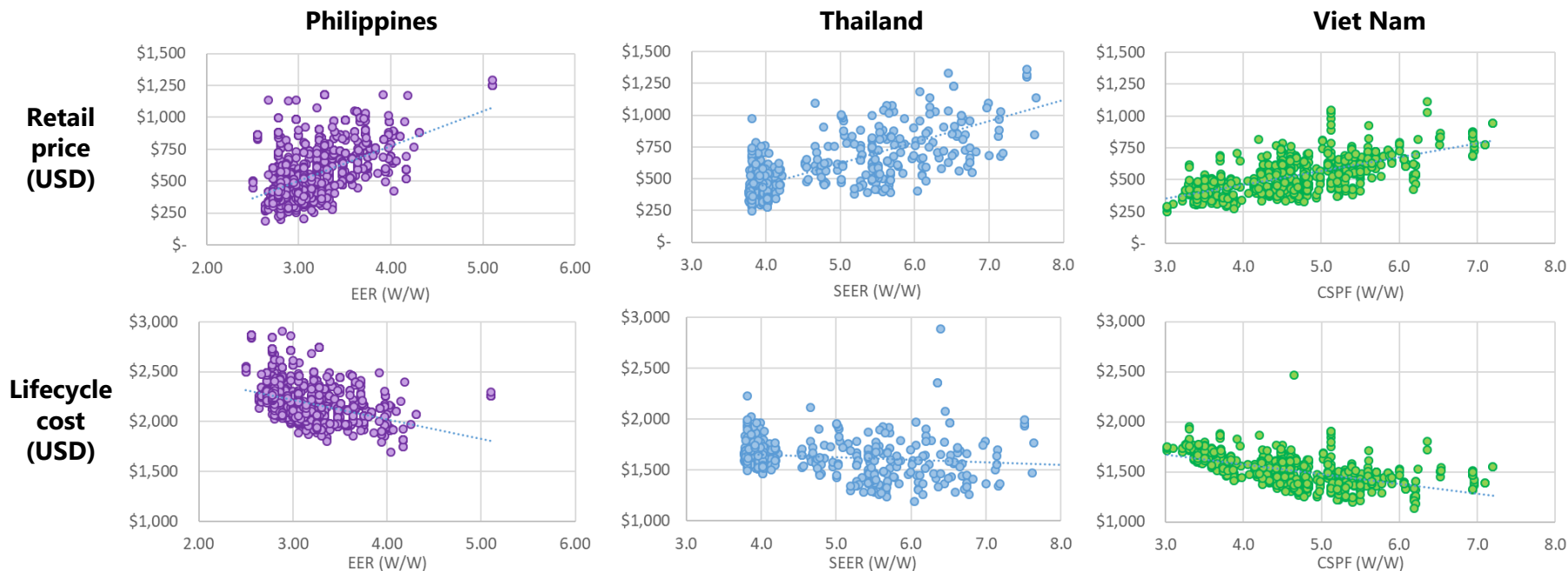
Present findings through webinars and Singapore International Energy Week 2020.

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The Future of Cooling in Southeast Asia



ASEAN highlights: ACs – Retail price and lifecycle cost vs. efficiency



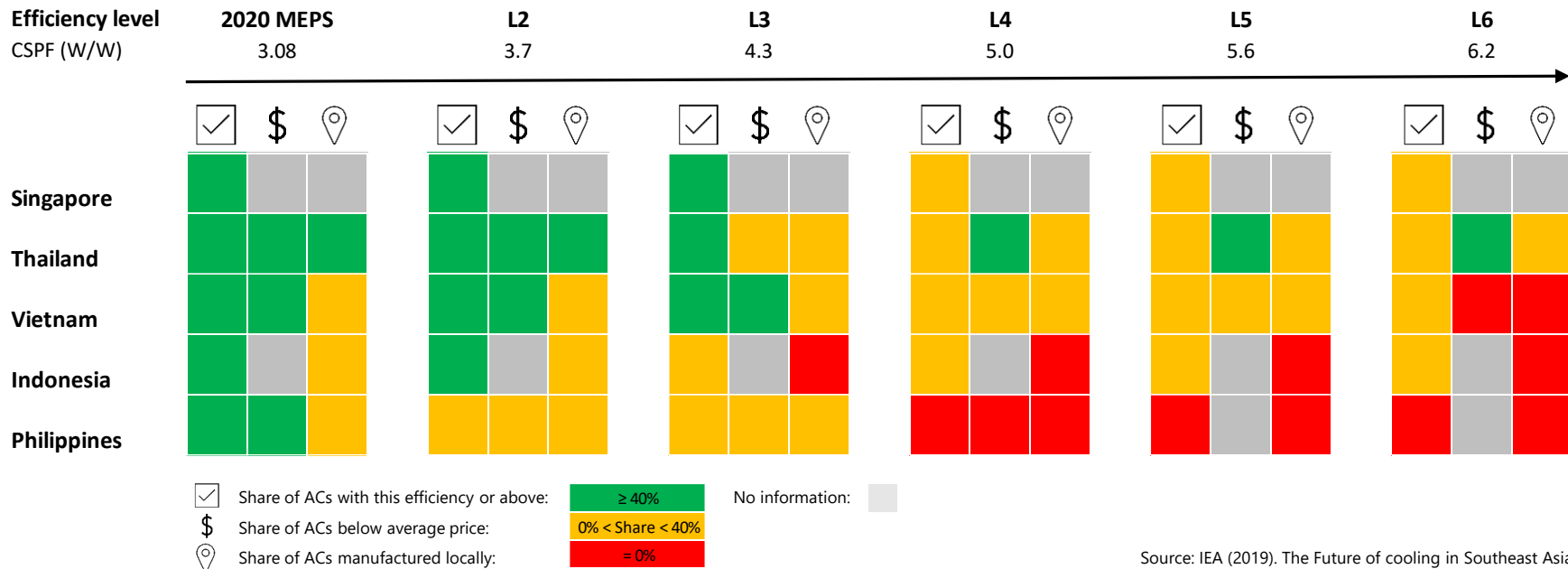
Notes: ACs normalised to electricity consumption of 1,000 kWh/year and cooling capacity of 12,000 BTU/hr.

Source: IEA (2019). The Future of cooling in Southeast Asia.

Despite higher retail prices, more efficiency ACs can have lower lifecycle costs thanks to lower energy running costs

ASEAN highlights: 2019 AC market in ASEAN by efficiency level

2019 AC market in selected ASEAN countries by efficiency level



Source: IEA (2019). The Future of cooling in Southeast Asia.

More efficient ACs are available in the Southeast Asian market and they do not have to be more expensive or imported

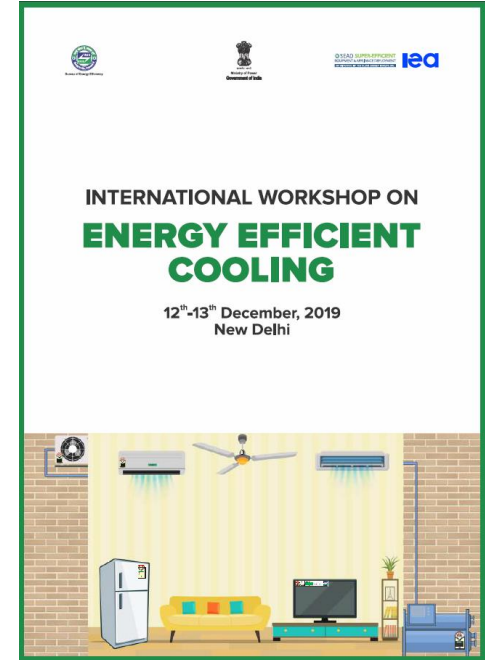
E4's work on cooling in India

A joint **IEA-BEE International Workshop on Energy Efficient Cooling** in December 2019 under Super-efficient Equipment and Appliance Deployment (SEAD) initiative.

150 representatives from governments, utilities and manufacturers, as well as leading international and domestic experts, to discuss how to accelerate energy efficient cooling.

As a follow-up, IEA published an article for **the Energy Manager Magazine** special edition on cooling in March 2020.

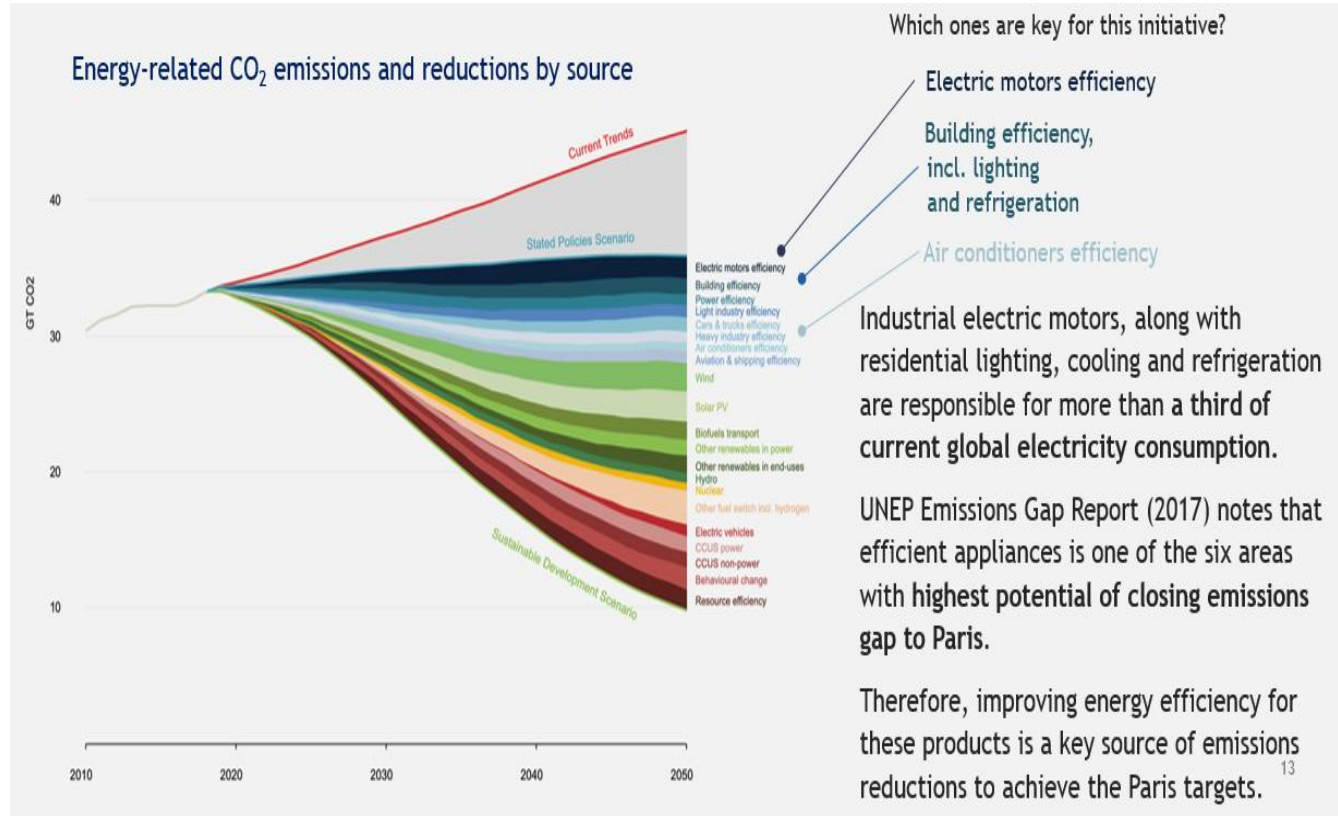
Upcoming study on **the impact of cooling on peak electricity demand.**



Super-efficient Equipment and Appliance Deployment (SEAD)

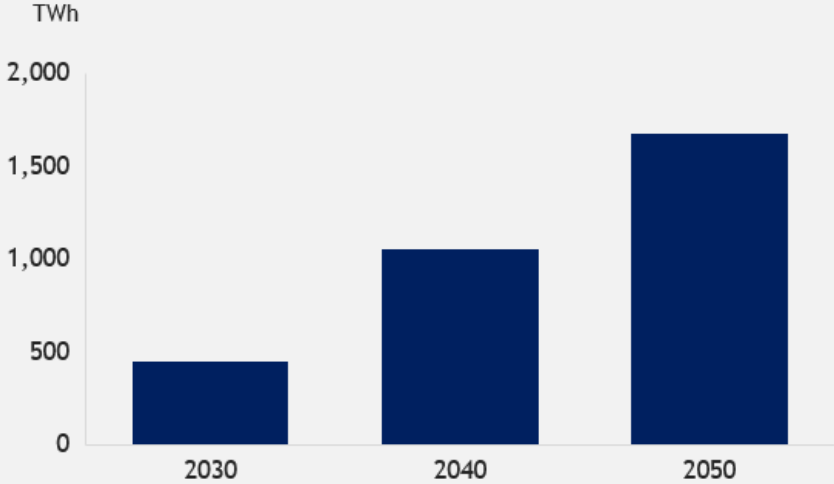


- Founded in 2009 under Clean Energy Ministerial (CEM)
- In 2016, the UK, EC and India took co-leads
- COP26 Product Efficiency Initiative
- In 2019, IEA responsible for operating duties
- Online webinars: *Stimulating Innovation towards High-Efficiency Cooling Solutions & Cooling as a Service*

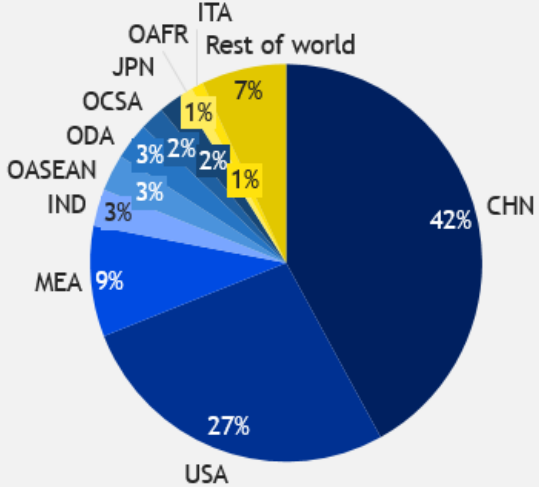


Deep dive into Air Conditioners

Global savings potential from residential ACs electricity consumption¹



2017 residential ACs electricity consumption by country



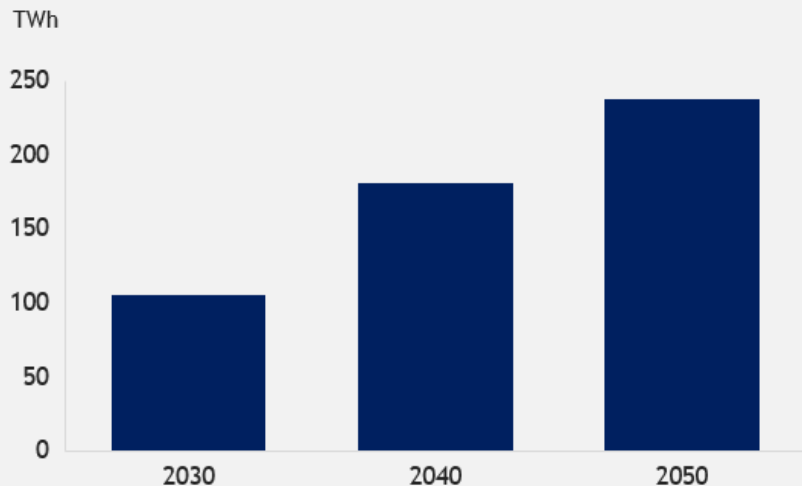
Provisional estimates - Do not distribute

1. Room and split ACs only - based on IEA Future of Cooling: High cooling vs. Efficient cooling without envelope scenario
Note: OAFR: Other Africa; OCSA: Other Latin America; ODA: Other Asia; OSEAN: ASEAN excl. Indonesia; MEA: Middle East
Source: IEA, Future of Cooling, 2018

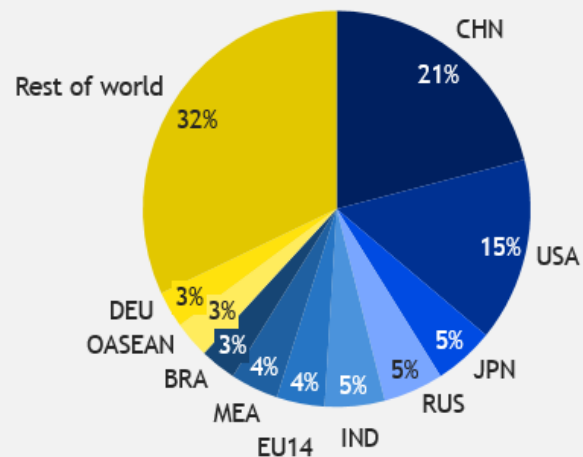
China accounts for more than 40% of the current global electricity consumption for residential air conditioners

Deep dive into Refrigerators

Global savings potential from residential refrigerators electricity consumption



2017 residential refrigerators electricity consumption by country



Provisional estimates - Do not distribute

Source: IEA

Note: OSEAN: ASEAN excl. Indonesia; MEA: Middle East; EU14: AUT, BEL, CZE, EST, GRC, HUN, IRL, LUX, NLD, POL, PRT, SVK, SVN, ESP

China and US account for more than a third of the current global electricity consumption for refrigerators

Energy Efficiency Ladder Framework

Ladder steps can be used to define performance requirements

- Minimum energy performance standards (MEPS)
- Label thresholds for both categorical labels and endorsement labels
- Requirements for rebates (such as obligation programmes)
- Requirements to appear on energy technology lists in general
- Future aspirational targets

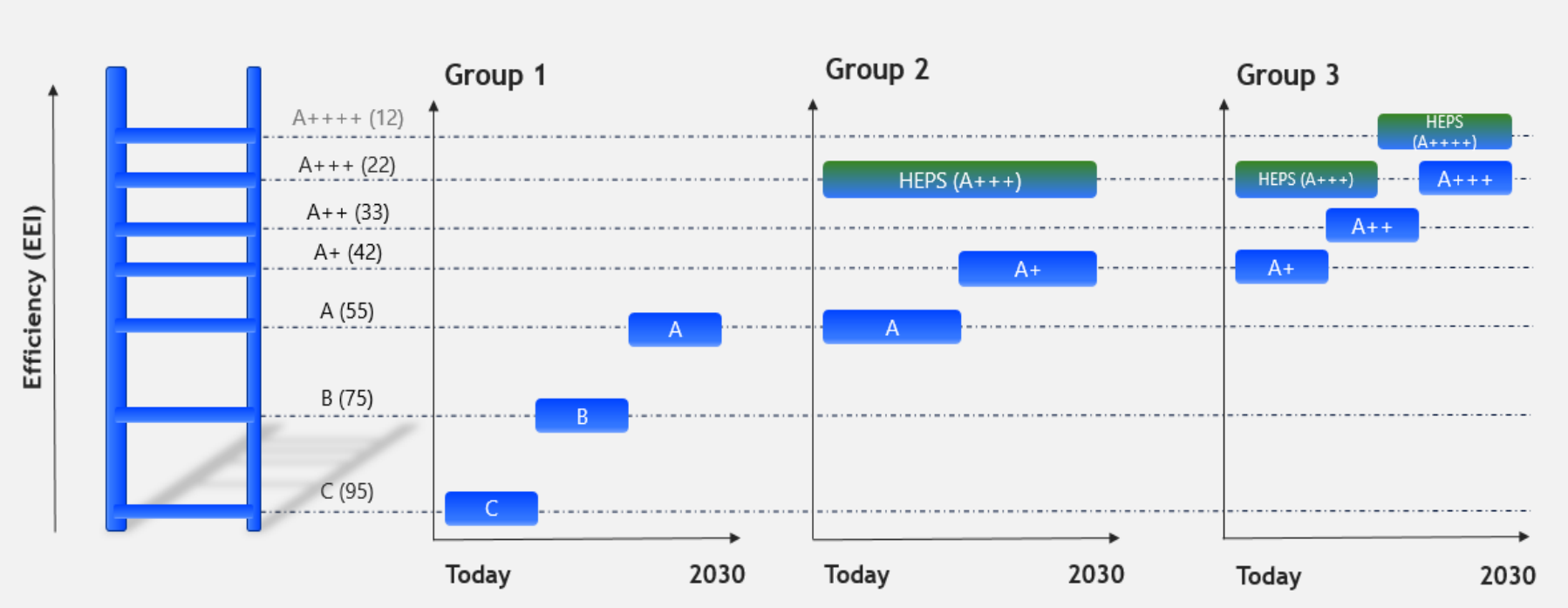
>> *Ideally, steps are used by different policy tools in a coordinated way, and revised over time.*

The key steps for developing an energy efficiency ladder

- Agree on testing procedures to measure energy efficiency
- Define efficiency thresholds (tiers or steps on the ladder)
- Map existing requirements
- Set the target steps to climb the ladder

Performance ladder as a basis to set energy efficiency criteria

Example: Refrigerators – Setting future requirements



Countries and regions can set different future levels, implementing them at different times.



- **Next steps**
- **Thank you**