



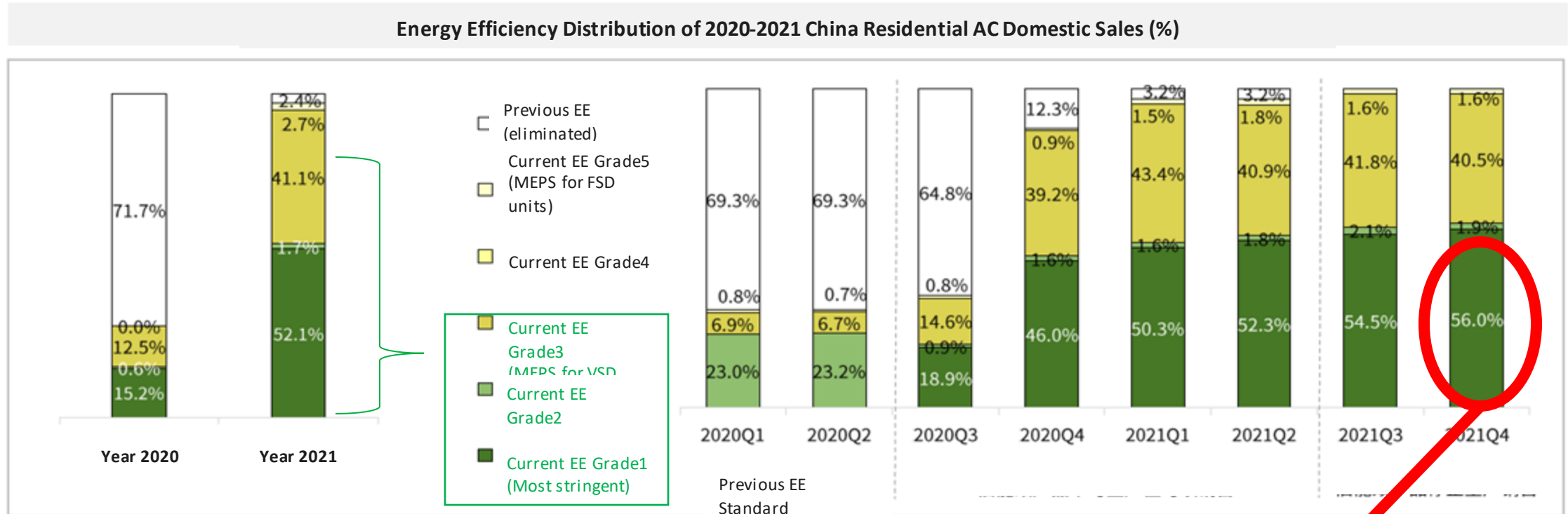
**WORKSHOP ON
ENERGY EFFICIENCY**
NAIROBI, KENYA
22 OCT 2023

Session 3: Policy Options for Adoption of Energy Efficient Equipment

Minimum energy performance standards (MEPS)
and labelling (S&L)

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[Global Cooling Efficiency Program](#)
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Standards and Labeling Programs are among the most effective policies

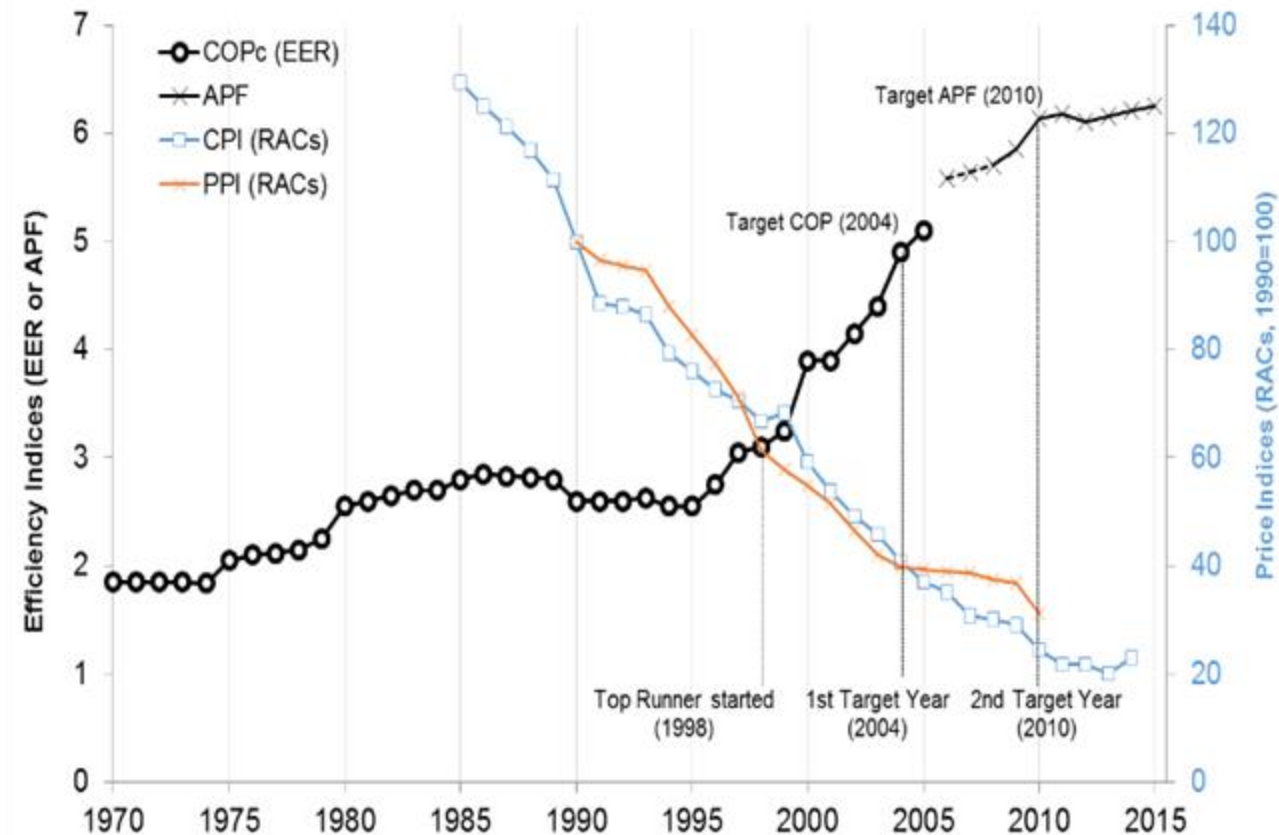


Source: ChinaIOL

FSD: fixed speed drive
VSD: variable speed drive (inverter driven)

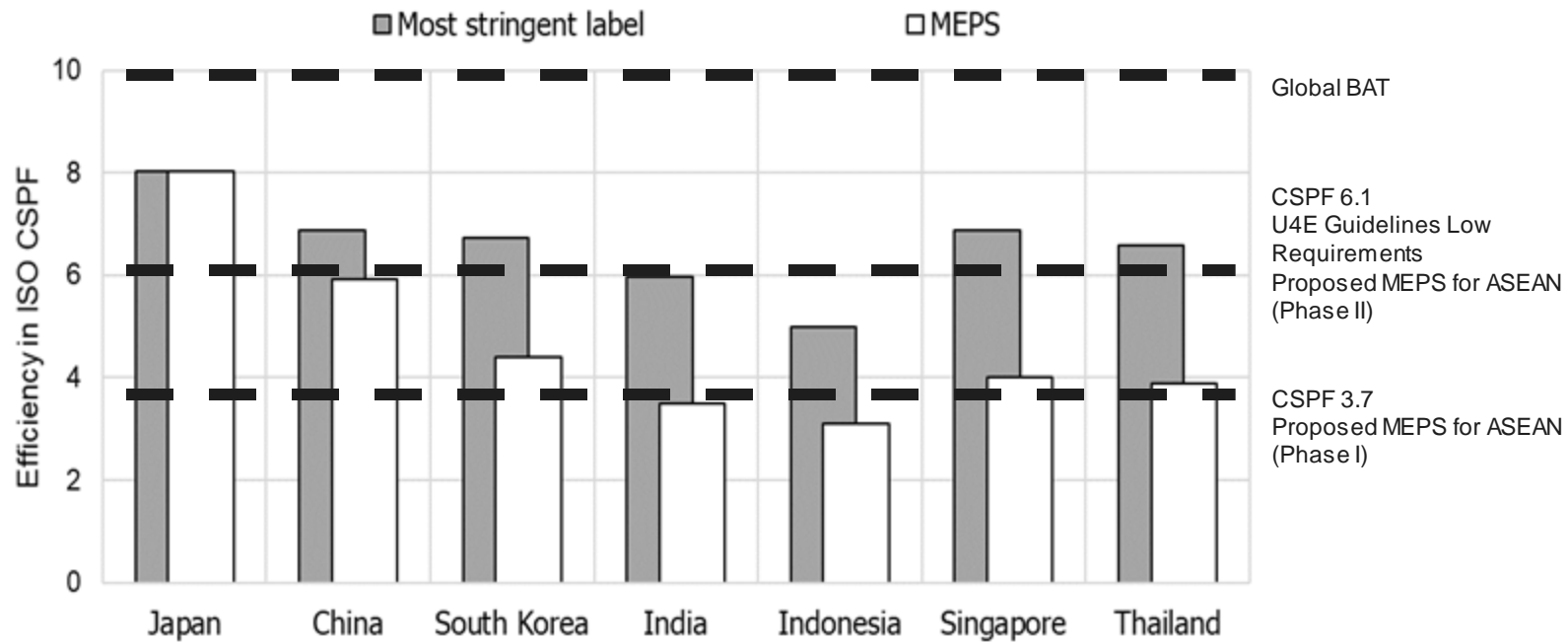
- From Q2 2020 to Q2 2021 China's room AC market transitioned to almost 100% inverters after revision of the S&L in 2020
- 56% of the market in Q4 2021 was at the highest grade 1
- ~20-30% lifecycle energy savings!

Efficiency at scale leads to innovation and lower prices: Room AC Efficiency under Japan's Top Runner Program



- If efficient equipment are made “at scale”, the cost of efficient technology falls due to “economies of scale”.
- Similar examples from US, Korea, India, EU for different appliances e.g. refrigerators and washing machines. (Abhyankar et al 2017 and Spurlock, 2023)

Harmonization Example: ASEAN Regional Roadmap



Source: Updated from Park et al. (2021) Harmonizing Energy-Efficiency Standards for Room Air Conditioners in Southeast Asia



Technical recommendations & Regional Policy Roadmap

Harmonizing of Energy-Efficiency Standards for Room Air Conditioners in Southeast Asia

ASEAN Cooperation Project

Promotion of higher efficient air conditioners in ASEAN through harmonisation of standards (ISO 16358) and strengthening of market verification and enforcement capabilities (Phase I)




FINAL REPORT

Prepared in consultation with the CSPF Project Technical Working Group

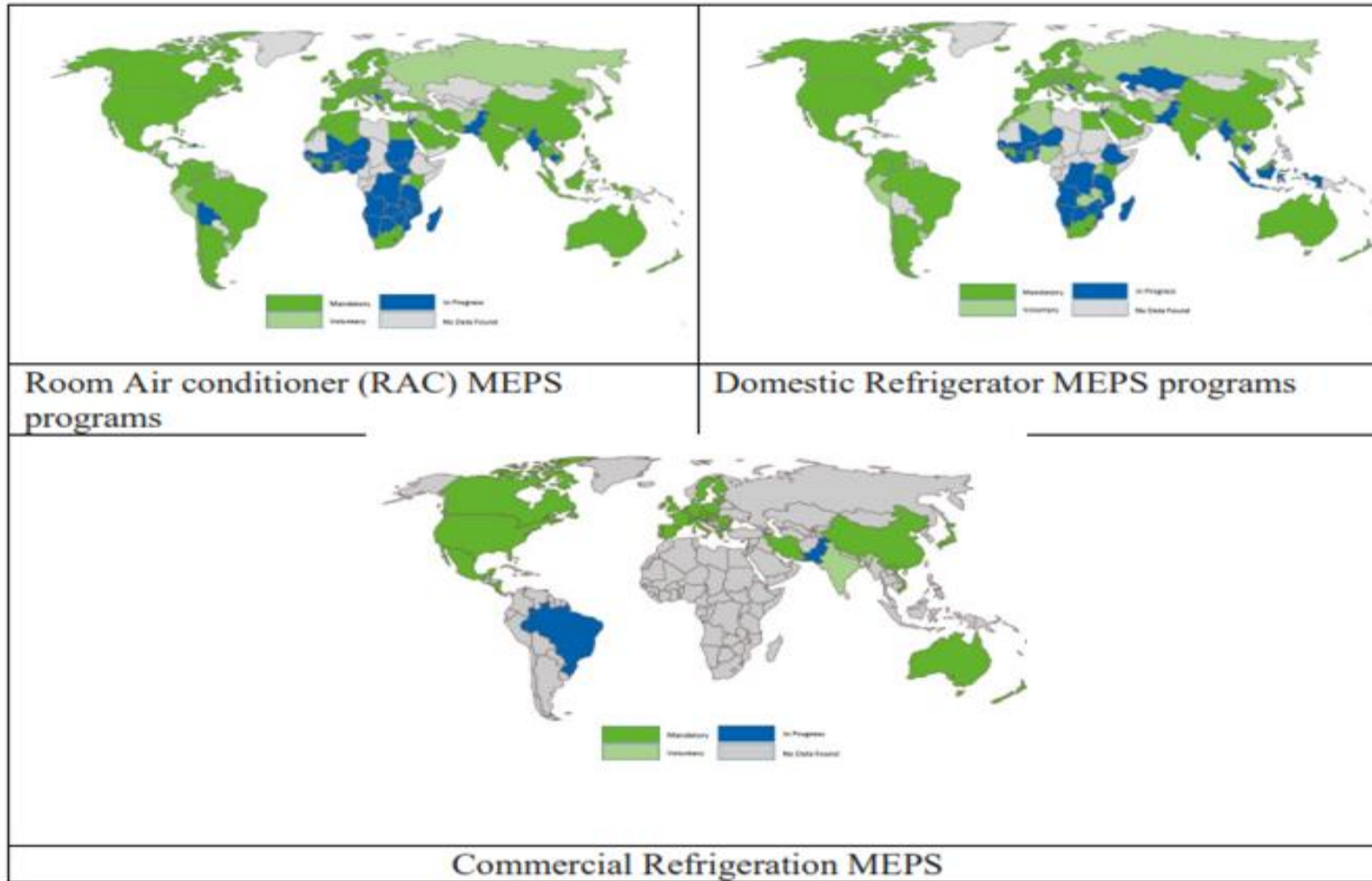
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February 2021

Energy Efficiency Standards and Labeling Programs: Current Status



- There is a patchwork of Energy Efficiency Standards and Labeling Programs for RACHP Equipment globally
- Technical Assistance and Regulatory Capacity Building is much needed in various Article 5 economies

Source: [TEAP 2023 Progress Report: Decision XXXIV/3 Energy Efficiency Working Group Report and UNEP United for Efficiency\(U4E\) Initiative](#)

Governance Architecture for Energy Efficiency of Equipment





Energy Research & Social
Science

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Perspective

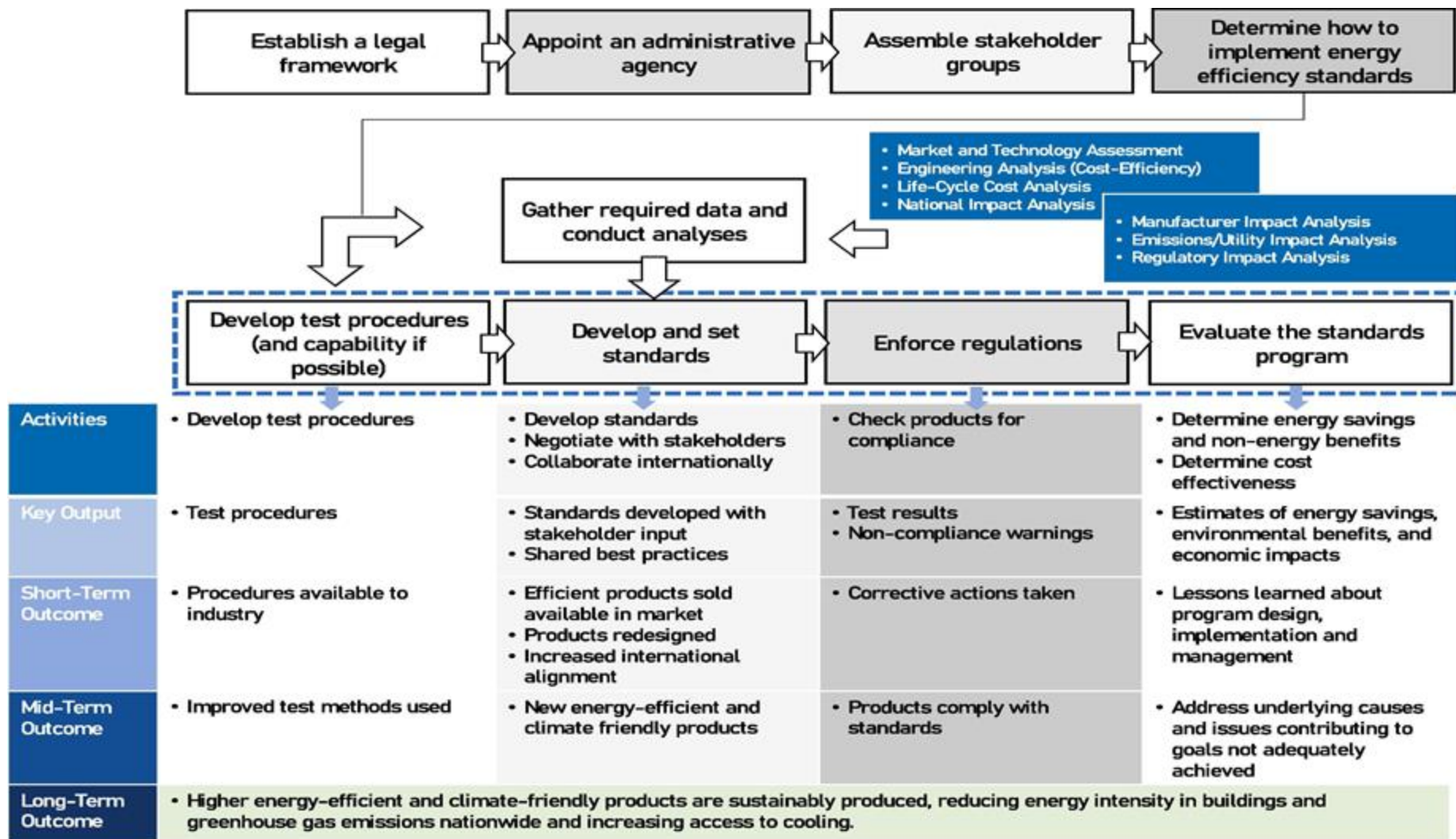
Ensuring the climate benefits of the Montreal Protocol: Global governance architecture for cooling efficiency and alternative refrigerants

Won Young Park^a  , Nihar Shah^a, Edward Vine^a, Patrick Blake^b,
Brian Holuj^b, James Hyungkwan Kim^a, Dae Hoon Kim^c

<https://www.sciencedirect.com/science/article/pii/S2214629621001614>

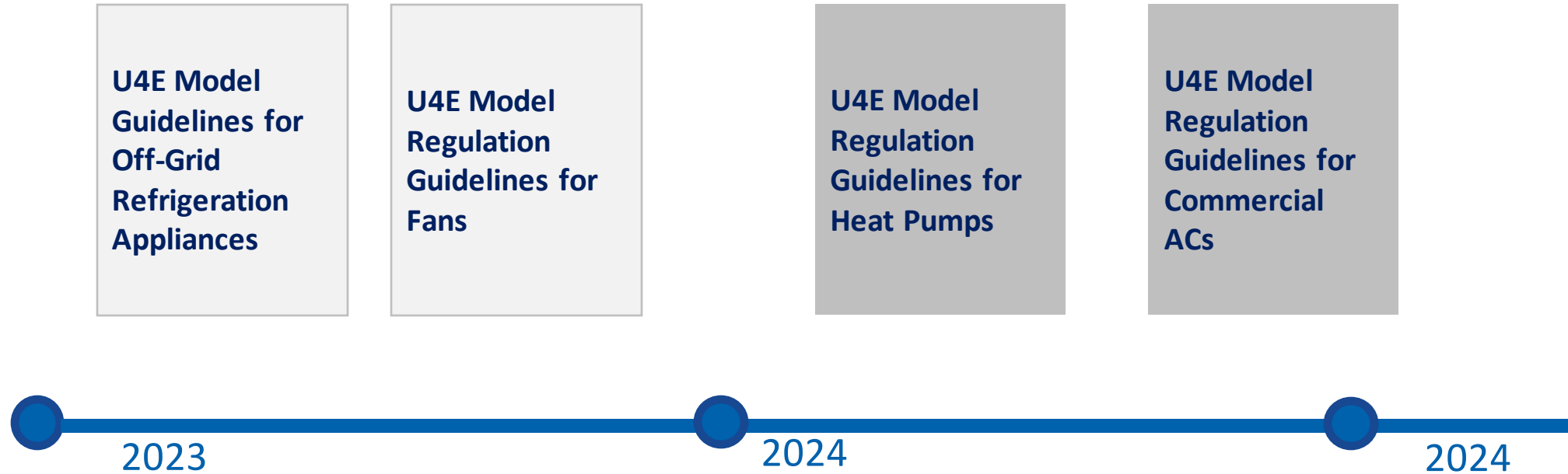
Evaluation, Measurement and Verification (EM&V) is essential for effective Energy Efficiency Standards and Labeling

Energy Efficiency Governance is both necessary and complex!



Source: Park et al, 2021, [“Ensuring the climate benefits of the Montreal Protocol: Global governance architecture for cooling efficiency and alternative refrigerants”](#)
[Energy Research and Social Science](#)

U4E Model Regulation Guidelines



Expanding the portfolio of MRG appliances to **heat pumps, fans, water heaters, commercial air conditioners** (and/or update or expand existing Model Regulation guidelines) **in 2024 and beyond.**

Summary

- Minimum Energy Performance Standards (MEPS) and Labeling Programs (S&L programs) are among the most effective energy efficiency policies e.g. China inverter RAC transition
- When implemented at scale, S&L programs can lead to increasing innovation and lower prices e.g. Japan's Top Runner program
- Regional Harmonization is a useful tool to achieve economies of scale e.g. ASEAN, SADC, etc
- Globally, there is a patchwork of energy efficiency S&L programs for RACHP equipment
- Technical Assistance and Capacity Building for EE in tandem with the refrigerant transition is much needed in various A5 economies.
- Evaluation, measurement and verification (EM&V) is a critical foundation for effective Energy Efficiency S&L programs
- U4E model regulation guidelines can serve as a useful starting point for launching or strengthening S&L programs globally