Energy-Efficiency and Climate Friendly Cooling

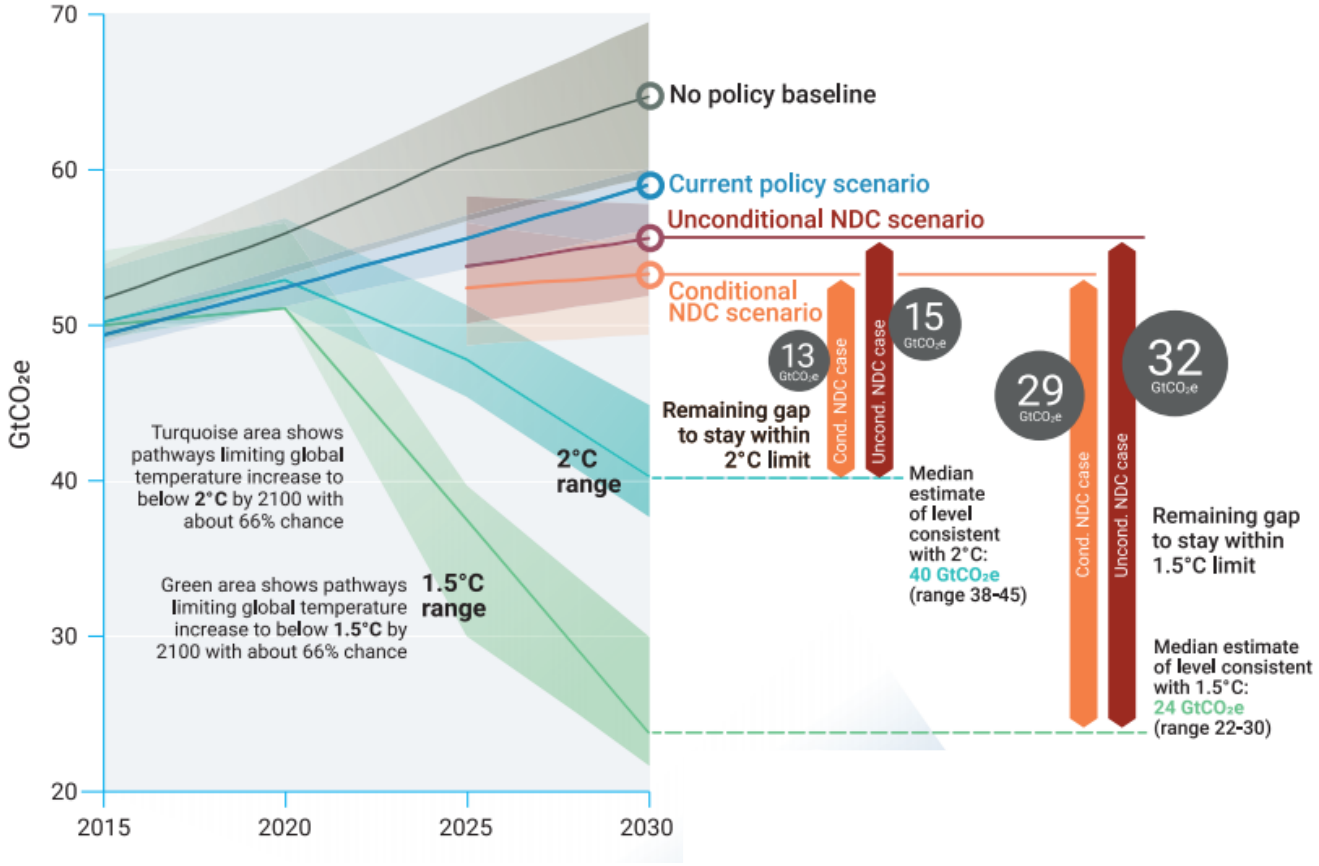
29 March 2019· Beijing

UNEP China Office

Global Greenhouse Gas Emissions – Status of Actions to Meet Objectives

- Global greenhouse gas emissions show no sign of peaking
- After three years of stabilization, 2017 had a 1.2% increase in CO2 emissions from fossil fuels, industry and cement
- Global GHG emissions in 2030 need to be approximately 25 percent and 55 percent lower than in 2017 to put the world on a least-cost pathway to limiting global warming to 2°C and 1.5°C respectively.

Global Greenhouse Gas Emissions by 2030



Source: UN Environment, Emission Gap Report, 2018

SUSTAINABLE ENERGY FOR ALL

联合国可持续发展目标——人人享有可持续能源

ENSURING *universal access* TO MODERN ENERGY SERVICES.

DOUBLING THE GLOBAL RATE OF IMPROVEMENT IN *energy efficiency.*

DOUBLING THE SHARE OF *renewable energy* IN THE GLOBAL ENERGY MIX.

可持续的城市及社区

经济的、清洁的能源

SUSTAINABLE ENERGY FOR ALL

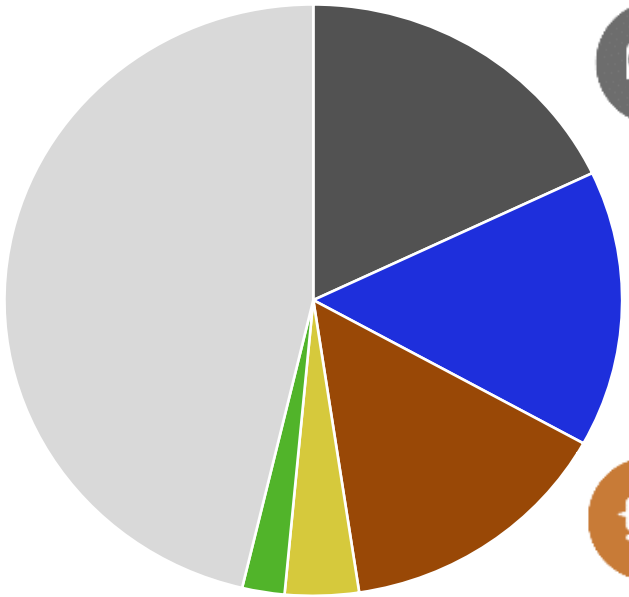
U4E United for Efficiency

SUSTAINABLE ENERGY FOR ALL

基于项目实践的加速器平台

U4E United for Efficiency

Address Products That Use >50% of Electricity



Room Air Conditioners
- Can improve efficiency by 30%

Indoor & Outdoor Lighting
- Can improve efficiency 40 – 60%

Electric Motor Systems*
- Can improve efficiency 20 – 30%

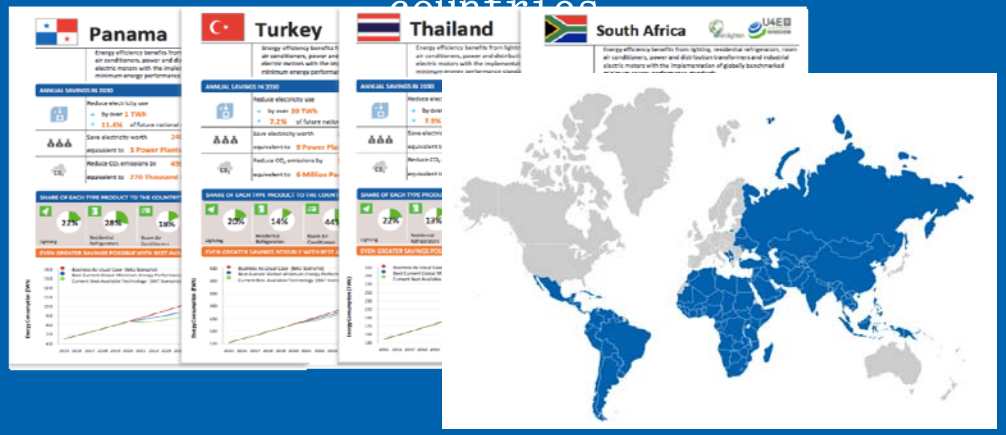
Residential Refrigerators
- Can improve efficiency by 60%

Distribution Transformers
- Can improve efficiency by 30%

Sources: International Energy Agency; Lawrence Berkeley National Laboratory; UN Environment

Method: Approximate savings in 2030 in emerging & developing economies if today's best available technologies are adopted

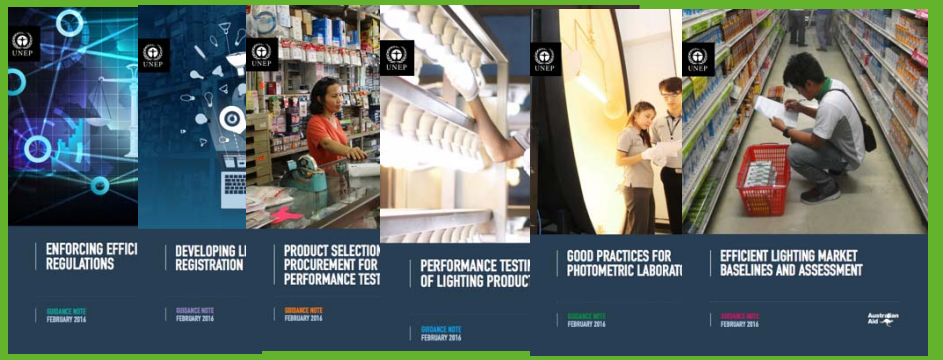
150 National Assessments of developing and emerging countries



ADDITIONAL TOOLS & PRODUCTS

5 Policy Guides for selected products

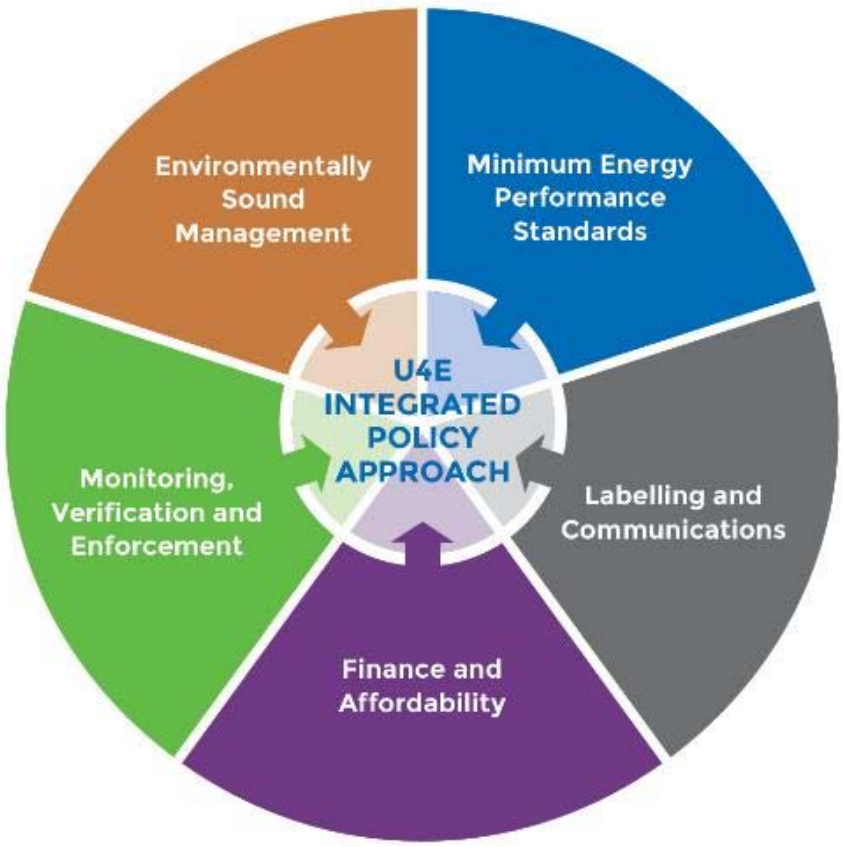
Monitoring, Verification and Enforcement Guides



Proven Approach for Transforming Markets

Comprehensive Market Transformation

(the approach for all U4E Projects)



Quick Wins to Prime the Market

(optional initial activities to inspire officials to commit to U4E Integrated Policy Approach)

- Market assessments to address data gaps, identify opportunities
- High-profile demos of new technologies
- Audits and retrofits / early replacements in major facilities
- Bulk procurements
- Capacity building for key officials

Partner Organisations

Manufacturers & Industry Associations	GREE 格力 · signify · ABB · Electrolux · 三花控股集团 SANHUA HOLDING GROUP · International Copper Association Copper Alliance · OSRAM · B/S/H/ · arçelik · Whirlpool · mabe
Technical Organisations & Initiatives	GELC · clasp · giz · NRDC · CARBON TRUST · IIEC · BASE · COPENHAGEN CENTRE ON ENERGY EFFICIENCY SE4ALL EE HUB · EESL · NIS · toptenAMBILAMP · GLOBAL LIGHTING CHALLENGE · AC ADVANCED COOLING CHALLENGE · GLOBAL CLIMATE PARTNERSHIP FUND managed by responsAbility · 4E
Funders & Implementing Agencies	gef · KIGALI COOLING EFFICIENCY PROGRAM · UN environment · UNDP

MODEL REGULATION GUIDELINES

Started with Lighting, Now Cooling

U4E worked on **Model Regulation Guidelines:**

→intended as a guideline to help **inform regulatory authorities and policy makers** in developing and emerging economies.

→sets a **minimum efficiency floor** to prohibit future sales of inefficient products from the market.

A range of stakeholders, including governments, manufacturers and environmental groups contributed to the document.

Supporting Global Market Transformation:

U4E United for Efficiency

U4E Model Regulations

Light Bulbs

Available now!

Linear Lamps

Spring 2019

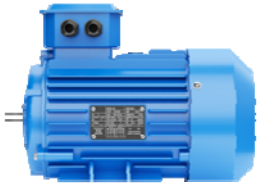
Residential Refrigerators

Spring 2019

Room Air Conditioners

Spring 2019

Electric Motors



Summer 2019

Distribution Transformers

Summer 2019

Climate Classes – Capturing Regional Temperature Differences

Varying requirements by climate classes helps countries get products suited to local conditions, and unlocks economies of scale as fewer models are needed to meet regulations

Refrigerators

Description	Class	Ambient Temperature Range (°C)
Extended Temperate	SN	+10 to +32
Temperate	N	+16 to +32
Subtropical	ST	+16 to +38
Tropical	T	+16 to +43

Air Conditioners (including heat pumps)

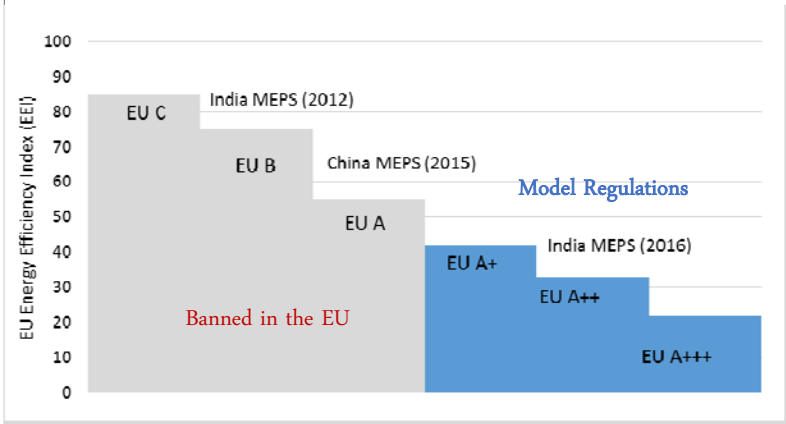
	Humid	Dry	Marine
Extremely Hot	0A (Extremely Hot-Humid)	0B (Extremely Hot-Dry)	
Very Hot	1A (Very Hot-Humid)	1B (Very Hot-Dry)	
Hot	2A (Hot Humid)	2B (Hot Dry)	
Warm	3A (Warm-Humid)	3B (Warm-Dry)	3C (Warm-Marine)
Mixed	4A (Mixed-Humid)	4B (Mixed-Dry)	4C (Mixed-Marine)
Cool	5A (Cool-Humid)	5B (Cool-Dry)	5C (Cool-Marine)
Cold	6A (Cold-Humid)	6B (Cold-Dry)	6C (Cold Marine)
Very cold	7		
Subarctic/ Arctic	8		

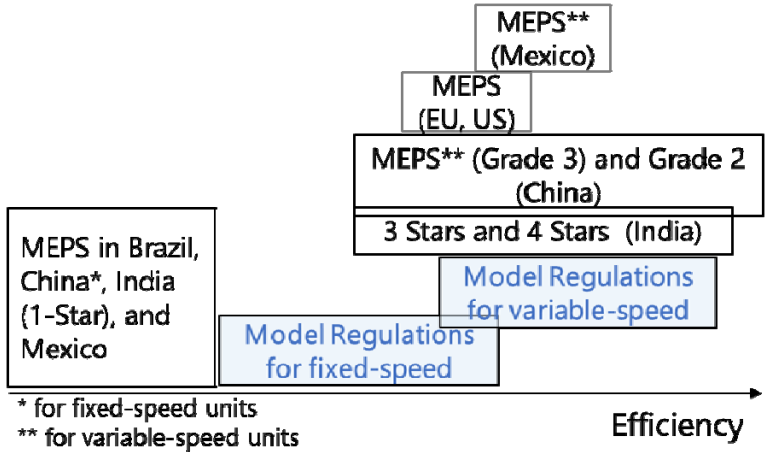
Test and Energy Performance Evaluation Methods

	Refrigerators	Air Conditioners
Category	• Refrigerators • Refrigerator-Freezers • Freezers	• Air conditioners, Heat pumps (reversible) • Fixed-speed, variable-speed
Reference Standards	• IEC 62552:2015 (Part 1, 2, and 3)	• ISO 16358: 2013 (Part 1, 2, and 3) • ISO 5151:2017
Key parameters	• Volume adjusted by compartment • Manual/automatic defrost • Energy consumption measured at 16° C and 32° C	• Performance measured at 35° C (and 46° C for extremely hot-dry regions) • Outdoor temperature bin hours by climate classes (per ASHRAE definitions)
Efficiency metric	• Annual Energy Consumption (kWh/year) for 25° C (or another reference temperature)	• Cooling Seasonal Performance Factor (CSPF, Wh/Wh) for cooling-only units • Annual Performance Factor (APF, Wh/Wh) for reversible heat pumps

Energy Performance Requirements

Refrigerators	Air Conditioners
• Energy use requirements comparable with current requirements in India and EU A+. • In 2015, nearly all products in the EU were qualified as A+ or higher.	• Fixed-speed requirements are more stringent than MEPS in Brazil, China, India, and Mexico. • Variable-speed requirements are comparable to current 3 & 4-Star in India





Inefficient products can't meet these levels, and there are stretch tiers for labels.

Contact

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