How to Achieve the World’s Best MEPS

Asia Clean Energy Forum
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CLASP improves the energy and environmental performance of the appliances & equipment we use every day, accelerating our transition to a more sustainable world.
Energy Demand from Appliances and Equipment is Growing

Figure 1: **Total Appliance and Equipment Final Energy Consumption (TWh) Under Business as Usual**

47% of the growth in final energy consumption between 2023 and 2050 will occur in Asia.

Note: Includes air conditioning, ceiling and portable fans, electric motors, lighting, refrigerator-freezers, residential hot water heaters, space heating, and televisions.

Current Policies Are Not Enough to Achieve Net Zero Emissions by 2050

- The solutions needed to achieve net zero emissions in the appliances sector already exists.
- To achieve net zero emissions, most of the appliances sold in 2030 need to match today’s best available technology.
- Prioritizing MEPS and decarbonization efforts within the buildings sector will be critical.

Figure 2: Key Milestones in the Pathway to Net Zero

Advancing Net Zero through Appliances

- To speed transition to Net Zero, **14 countries** signed the Product Efficiency Call to Action at COP 26.

- Signatories committed to doubling the efficiency (or halving the energy use) of four common types of appliances and equipment by 2030.

- Residential air conditioning
- Lighting
- Residential refrigerators and freezers
- Industrial electric motor systems

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Identifying Top Energy Efficiency Standards for Priority Appliances

- Reviews MEPS across key countries for six high energy-consuming appliances & equipment (e.g., air conditioning, electric motors, lighting, refrigerators, space heating, and water heating).
- Compares MEPS to global goals and benchmarks
  - United for Efficiency (U4E Model Regulations)
  - COP 26 Call to Action (doubling appliance efficiency)
  - Electrification
  - Net-zero emissions

https://www.clasp.ngo/tools/worlds-best-meps/
Defining the World’s Best MEPS

**LIGHTING**
- **Product:** Non-directional general service indoor lighting products
- **Metric:** Luminous efficacy (lm/W)
- **Target:** 90 lm/W

**ELECTRIC MOTORS**
- **Product:** 3-phase alternating current induction motor (low voltage < 1000 V)
- **Metric:** IE efficiency classifications defined in IEC 60034-30-1
- **Target:** IE3

**AIR CONDITIONERS**
- **Product:** Split system air conditioners with 7 kW (24,000 Btu/h or 2 refrigeration tons) cooling capacity
- **Metric:** Cooling seasonal performance factor (CSPF)
- **Target:** 5.1 Wh/Wh

**REFRIGERATORS**
- **Product:** 400 L frost-free refrigerator-freezer
  - 300 L fresh-food compartment
  - 100 L top-mounted freezer compartment (3 star/-18 °C)
- **Metric:** Annual energy consumption (kWh)
- **Target:** 279 kWh/year

**SPACE HEATING**
- **Product:** Product types with significant potential for efficiency/CO₂ reduction: gas furnaces & boilers, electric resistance, one-way air conditioners
- **Metric:** Percentage of market subject to ambitious policies (0-100%)
- **Target:** 50% of market

**RESIDENTIAL WATER HEATERS**
- **Product:** Gas storage & instantaneous, electric storage
  - Focused on major technology shifts: condensing (≥86%) and heat pumps (>100%)
- **Metric:** Percentage of market subject to ambitious policies (0-100%)
- **Target:** 5% of market
Appliance efficiency policies are at different stages across Asia, some have longstanding programs, while others are just beginning their journey.

Several Asian economies have MEPS that meet the target or are within range of the target:

- **China**: Electric motors, air conditioning
- **India**: Lighting (LEDs), refrigerators
- **Indonesia**: Lighting (LEDs)
- **Japan**: Electric motors, air conditioning, refrigerators, space heating

Aligning policies to existing model regulations would result in more ambitious MEPS and larger savings.

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Efficiency Not Moving Fast Enough

- Limited historic and current product efficiency data make tracking progress against doubling goal challenging
- For countries with data, we only observe sufficient progress on refrigerators
- No progress on air conditioners or motors
- Insufficient data to determine lighting progress, but likely forthcoming due to new MEPS and Minamata
Figure 4: Efficiency Improvements in Residential Refrigerators

- Initial data includes 4 Call to Action signatories and 2 other countries
- Up to 3-13% reduction in average energy consumption compared to historical data
- Metric is annual energy consumption or proportional index (lower is better)

5. CLASP, forthcoming paper on tracking progress towards existing efficiency commitments.
Air Conditioners

- Initial data includes 5 Call to Action signatories and 1 other country
- While some countries show improvement, no progress on average
- Metric is seasonal (SEER, CSPF, APF) or full-load (EER) efficiency (higher is better)

6. CLASP, forthcoming paper on tracking progress towards existing efficiency commitments.
Additional Considerations for Governments

• When developing appliance efficiency policies there are many unique factors to consider, e.g., institutional maturity, technical capacity, priorities, etc., that policymakers should consider.

• Ensuring a strong supporting institutional environment is also critical to successful implementation. Examples include:
  • Test laboratories and strong testing capacity
  • Existence of regional frameworks
  • Compliance programs
  • Presence of consumer advocacy groups
## Tools and Resources

### World’s Best MEPS
Comparison of world-leading appliance efficiency standards

[https://www.clasp.ngo/tools/worlds-best-meps/](https://www.clasp.ngo/tools/worlds-best-meps/)

### Mepsy
Model the impacts of energy and carbon reduction policies

[https://clasp.shinyapps.io/mepsy/](https://clasp.shinyapps.io/mepsy/)

### CPRC
Searchable database of 1500+ quality, water, and efficiency policies

[https://cprc-clasp.ngo/](https://cprc-clasp.ngo/)

### VeraSol
Solar-powered and off-grid appliance database

[https://data.verasol.org/](https://data.verasol.org/)

### Compliance Toolkit
Resources to help design effective compliance strategies


### Computer Testing Tool
Measure the power and performance of a personal computer

[https://www.clasp.ngo/tools/](https://www.clasp.ngo/tools/)
Thank you!
Any questions?

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- Initial data includes 2 Call to Action signatories and 1 other country
- No progress since 2019 (last data available)
- Metric is full-load efficiency (higher is better)
- Initial data includes 1 Call to Action signatory
- No current data, but CLASP currently collecting
- Standards and product lists are divided by technology, making comprehensive market view impossible
- Metric is luminous efficacy (higher is better)