

Cooling Benchmarking Study

Rationale for Benchmarking RACs

Efficiency of RACs is critical and could be improved through cross-economy comparisons, but those comparisons are challenging.

- RACs contribute heavily to peak load, and are being purchased at rapidly rising rates in developing economies.
- Despite global trade, information is scarce about RAC market characteristics, minimum energy performance standards (MEPS), and labels.
- It is difficult to compare RAC performance and efficiency policies across economies due to variations in test procedures and efficiency metric formulas.

CLASP initiated the Cooling Benchmarking Study to enable international comparison of the energy efficiency (EE) performance of commercial- and residential-sector room air conditioners (RACs).

Resources Components

This resource for policymakers and standards and labels (S&L) experts includes:

- A review of current and past RAC market characteristics in various economies;
- An in-depth review and comparison of the test procedures used; and
- Conversion formulas that enable comparison between RAC energy efficiency metrics in various economies.

Findings for Policymakers

- **RAC energy efficiency varies widely across economies:** For example, the most efficient RAC product in the Japanese market is 20% more efficient than the most efficient product in the European Union.
- **Local conditions partially explain efficiency differences:** For example, high electricity prices can lead to efficient products, and differing maturity levels of RAC markets affect technology choices.
- **Stringency of energy efficiency policy requirements varies widely across economies,** and more stringent regulations can have positive impacts on RAC efficiency.
- **Using a seasonal metric** to rate energy efficiency accounts for actual product use over the variable temperature and humidity demands of the entire cooling season.
- **Conversion formulas derived in this study enable comparison among RAC performance metrics** currently in use around the world.
- For most economies, **large energy saving opportunities are possible by setting energy performance requirements at the level of Japan** for large and small split AC units; split units dominate the market in most economies.

Global Market Characterization

There has been an upward trend in sales of RAC units over the last five years in most economies.

The market is mostly dominated by split system units. Inverter split units are widely available in industrialized economies, and market shares are increasing in developing economies as well.

RAC Efficiencies in the Market

Single and multi-split AC products have become more efficient over the past decade in the countries analyzed.

However, window AC products have remained at about the same efficiency between 2006 and 2011 in the US, and have become less efficient in the EU over the same period.

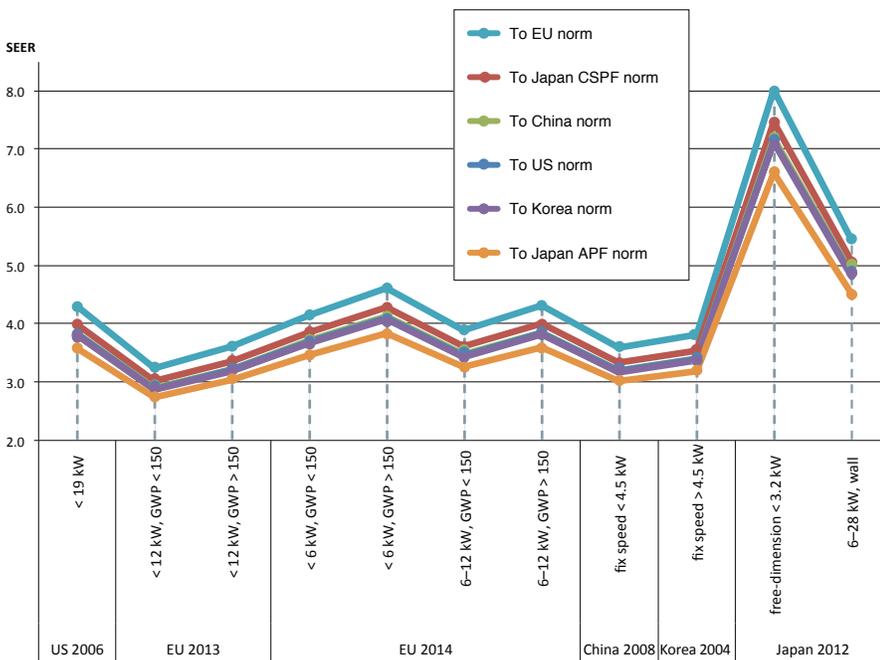
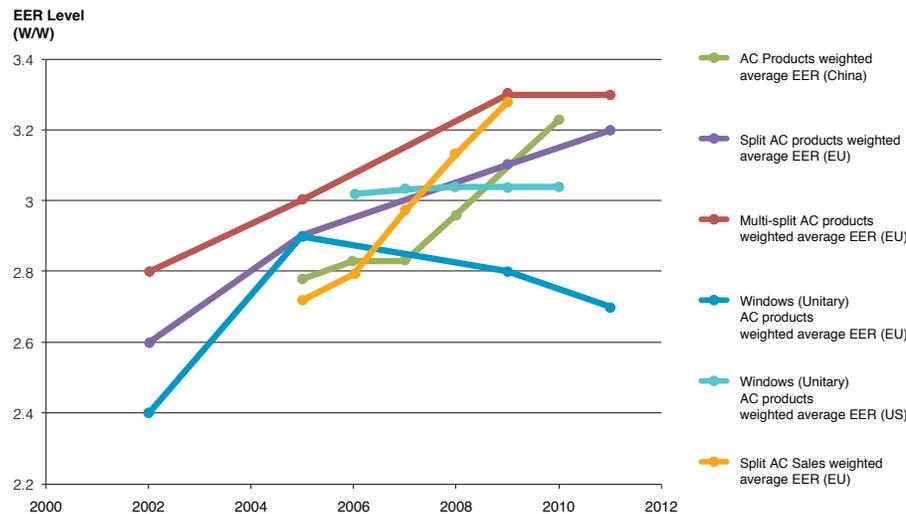
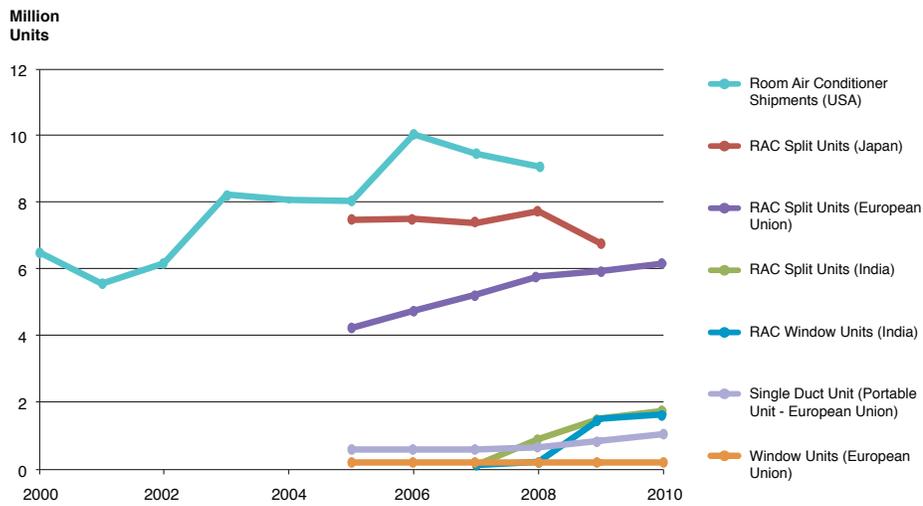
Benchmarking RAC Energy Efficiency

The derivation of conversion functions allowed comparison of MEPS requirements across economies.

In this study, Japan had the most stringent energy requirements for split AC units.

CLASP Resources & Tools Online

The CLASP website is a hub for global S&L best practice and provides online tools and resources to S&L practitioners at no cost. To access CLASP's online resources and tools, please visit clasponline.org/ResourcesTools



The full Cooling Benchmarking Report and other S&L resources are available at the CLASP website: www.clasponline.org/CoolingBenchmarking