

# Mapping & Benchmarking of Refrigerators and Freezers

The IEA's 4E Mapping and Benchmarking Annex provides policy makers with evidence based comparisons of the performance of products across international boundaries. This allows benchmarking of the success of national policies in managing product energy consumption and efficiency and enables identification of opportunities to further optimise product performance.

This briefing describes the outcomes of the international comparison of refrigerator/freezer combinations and stand alone freezers, and is one of a series covering commercial, domestic and industrial products.



## Observations for Policy Makers

- **Differences in cold appliance energy consumption between countries** are relatively small and less than expected given the variation in appliance sizes.
- **Energy efficiency has been improving in almost all regions**, although the rate of improvement varies significantly between countries. Some of this efficiency improvement is the result of increased product sizes rather than improved product performance.
- **The combination of minimum performance standards and mandatory labelling** appear to have the greatest market impact compared to other interventions, provided they are revised on a regular basis.
- **Total energy consumption will naturally increase** with the growth in household numbers and/or second appliance ownership. Strong policy intervention is required to further reduce new product consumption to minimise or reverse this increase.
- **If reduced energy consumption is the goal** rather than efficiency, consideration should be given to setting maximum product energy consumption limits.
- **Large savings opportunities are available for all countries** by setting MEPS at levels equal to the average product performance in the UK (for small products), and the average product performance in Korea (for larger products).

## More Information

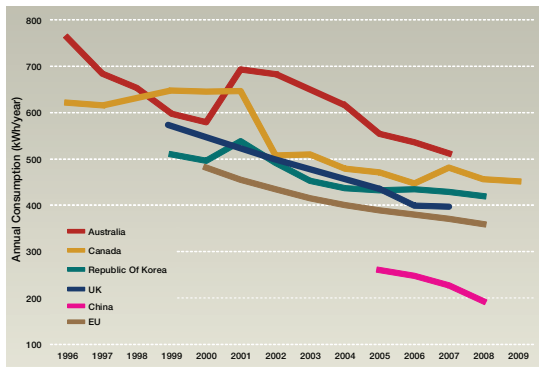
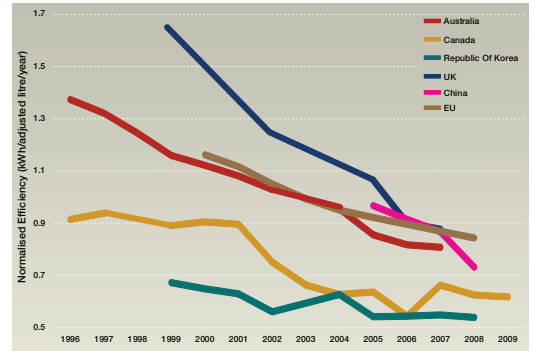
All publicly available Annex mapping and benchmarking outputs are available on the Annex website at <http://mappingandbenchmarking.iea-4e.org>.

For further information email: [contact@mapping.iea-4e.org](mailto:contact@mapping.iea-4e.org)

# Key Findings

## Product Efficiencies

Policies to improve the efficiency of refrigerators and freezers have been in force in most economies for many years. These have focussed on reducing the energy used per unit volume, and have been highly effective.



## Energy Consumption

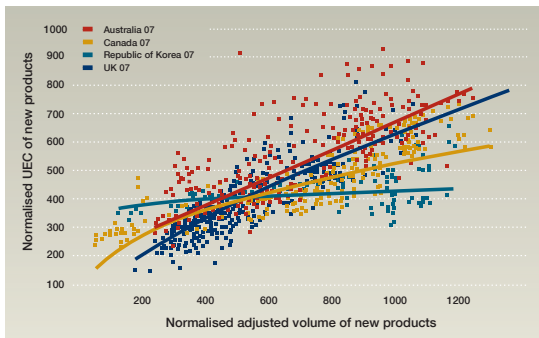
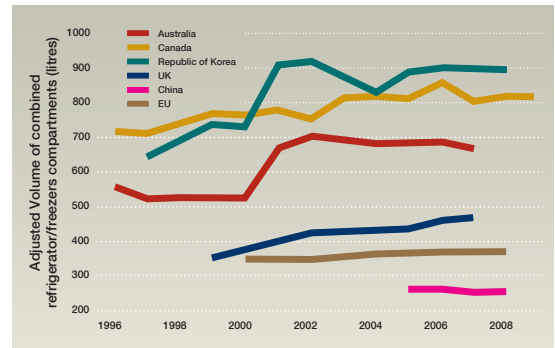
The unit energy consumption of new refrigerator/freezers in most markets is getting smaller, and converging towards 350 to 400kWh/year.

Amongst the countries analysed, China's refrigerator/freezers use approximately half this amount of energy per appliance and less than 50% of the worst performing country.

## Product Size and Ownership Levels

Larger refrigerators are typically more efficient even though they consume more energy. The growth in the average size of refrigerators observed in all markets except in the EU and China has been responsible for some of the historical efficiency improvement. Without the impact of larger appliances, efficiency gains would have reduced unit energy consumption even further.

Countries where refrigerator sizes or ownership rates increase rapidly are likely to see growing national electricity consumption from refrigeration.



## Potential for Improvement

The energy consumption of similar sized products varies considerably indicating significant scope for improvement.

The UK has the most efficient smaller units, whereas the Republic of Korea has the most efficient larger units. If the four countries shown matched these average efficiencies, a typical fridge-freezer would use 20% less energy.