

ENERGY EFFICIENCY - Domestic Refrigeration, Air-conditioning & Motors

**Reducing C02 Emissions.
Reducing Energy Consumption.
Reducing Energy Costs.
Improving Motor Efficiency.**

Subject: Domestic Refrigerators & Air-conditioners

A large amount of Energy is consumed by Domestic Refrigerators and Air-Conditioners every year.

Every home has at least 1 refrigerator and many with 2 or more. The use of air-conditioning in homes and businesses is increasing at a rapid rate. Currently, refrigeration and air-conditioning equipment has to meet the requirements of MEPS (Minimum Energy Performance Standard); however, these standards are based on 35°C temperature tests.

Testing Standards & Suggested alteration

Results of tests at 35°C can still be used for MEPS, however, results of energy consumed at 30°C for Air-Conditioning and 25°C for Refrigeration is also required, as these temperatures (or lower) are more the normal situation. The energy consumption of refrigeration and air-conditioning at temperatures of 30°C (Air-conditioning) and 25°C (Refrigeration) should form part of the (updated) MEPS requirements, for it is at these temperatures that energy can be massively reduced along with a reduction in C02 emissions. The energy reduction can be achieved with the inclusion of Motor Optimising Technology.

Note: It does not have to be a requirement to meet certain criteria at this stage; however, as air-conditioners and refrigerators fitted with a Motor Optimiser **will reduce Energy and C02 Emissions**, the Government needs to seriously take note and move quickly to implement mandatory requirements with this proven energy saving technology. In the meantime energy labelling should be introduced showing (in addition to current standards) the energy usage rate (by refrigerators and air-conditioners) at normal (more realistic) operating temperature/conditions.

Air-Conditioning Starters

Currently there is a requirement for Air-conditioners in relation to the amount of current drawn (Amps) on start. To meet these requirements most Manufacturers/Importers of Air-Conditioners have fitted "Soft Starters" to many models to enable these to meet the Australian Governments requirements.

There are now available devices that both Soft Start the Air conditioner and Optimise the motor for "Reduced Energy" during normal operation. The energy savings with an Optimiser fitted, can be substantial, as the load on the Air-conditioning system falls.

As there is already a cost to fit Soft Starters to meet Australian Standards, and costing is similar for an "Energy Saving Motor Optimiser and Soft Starter Combination", then this must become a requirement. The Government needs to act as this is not an added cost (it is already a cost) at the point of manufacture.

Note: The above applies to fixed speed compressors used on nearly all air-conditioners installed in homes and businesses. It does not apply to inverter types where the motor speed is varied, however, the same proposed dual/modified energy labelling & MEPS registration figures should apply (at the more realistic test temps) to all air-conditioners.

Refrigerators, Air-conditioners & Motors - Single Phase and 3 Phase (General Information)

Energy saving devices are available for domestic and larger commercial refrigerators. Energy saving devices are available for home and commercial/industrial air-conditioning systems.

Energy saving devices are available for any machinery with electrical motors that run at a fixed speed and a variable load. - eg: Industry, Manufacturing and Mining etc.

The government already has MEPS and energy labelling requirements for air-conditioners and refrigerators used in homes and businesses. By introducing changes (ie: Dual figures) to labelling and MEPS registration requirements this could be the first step.

2nd Step: Energy Saving Technology devices are now available for Retrofit, OEMs and Importers of refrigerators and air-conditioners, there is no excuse for equipment **not** to meet the requirements for "Energy Saving" in the future, as the technology is now available.

The Government must look at introducing changes to ensure that this technology is applied during manufacture to keep costs down and/or before distribution throughout Australia.

The above and attached details describe and demonstrate positive energy savings and CO2 reduction with the technology that is now available.

Attached:

1. Domestic Refrigerator Field Test Graph Report
2. Air-conditioning Domestic Type Test and Graph Report
3. Estimations: Energy Savings & CO2 Reduction

PROJECTED - Energy Saving & CO₂ Green House Gas Reduction (Data based on test results and estimates)

Air Conditioning Equipment - Domestic Use

Minimum Savings:

220watts per hour (based on test results attached):

Run hours (as per Energex Consumer Information Calculations) =

2420watts per day saved.

Savings: **4,743kWh's**

Based Estimated Total Quantity of Models: 500,000 2HP, 2.5HP and 3HP Air Conditioners installed throughout Australia in homes etc.: Minimum Saving Of:

2.4 Million kWh's Saved from the National Grid

2,500 tons of CO₂ Greenhouse Gas Emissions removed per year.

Refrigerators - Domestic

Minimum Savings:

15 watts per hour (based on test results attached)

@ 14 hour run time per day = 210watts per day

This Equals **76.6 kWh's p.a**

Estimation:

Approximately 8 Million Domestic Refrigerators in Australia:

Equates to **612 Million kWh's** Saved from the National Grid

Therefore, removing **636,000 tons of CO₂** Greenhouse Gas Emissions per year.