

1. What are the main differences between how the old star ratings were calculated compared to the star ratings on the Zoned Energy Rating Label?

On the old Energy Rating Label, the star rating was calculated based on the performance of the air conditioner at full load at a single temperature point. For cooling stars, the temperature was based on an outside temperature of 35 degrees C and for heating stars an outside temperature of 7 degrees C.

On the Zoned Energy Rating Label, the star rating labels are based on the performance of the air conditioner across a range of outside temperatures representative of the climate zone for which the star rating applies and weighted for the frequency with which those temperatures occur.

There is no direct comparison between star ratings on the old Energy Rating Label and Zoned Energy Rating Label.

2. How are ducted systems treated under the new rules?

Ducted air conditioner models registered under the 2019 Determination are not required to display a zoned energy rating label.

Ducted units of less than 30kW capacity registered under the 2019 Determination may display a zoned energy rating label.

el. The zoned energy rating label would use seasonal energy efficiency ratings based on Annual Coefficients of Performance (ACOPS) and Annual Energy Efficiency Ratios (AEERs), rather than simply Coefficients of Performance (COPs) and Energy Efficiency Ratios (EERs).

Note that even those ducted air conditioners under 30kW that do not carry a label will still be required to provide their Seasonal Energy Efficiency Ratios for inclusion in the registry and as part of the registration process.

Sound power testing for ducted air conditioners measures the outdoor noise level only.

3. Do the new requirements apply to window/wall units?

Yes. These units are already subject to Minimum Energy Performance Standards (MEPS) and labelling requirements and will continue to be subject to them when a window/wall model is registered under the 2019 Determination.

4. Are unitary units covered?

Some unitary units are covered in the 2013 and 2019 Determinations.

Wall mounted unitary single duct air conditioners and portable unitary single duct air conditioners are covered by the 2019 Determination. Such air conditioners must be registered and labelled, if they are imported into Australia or manufactured within Australia and offered for supply (eg sold in a shop) after 31 March 2020.

Wall mounted unitary double duct air conditioners and portable unitary double duct air conditioners are covered under both the 2013 and 2019 Determinations.

Window-wall units are covered.

Spot coolers (unitary air conditioners that lie wholly within a conditioned space and draw air for both the evaporator and condenser from the conditioned space and expels both of these back into the conditioned space) are not covered.

5. Why do single duct portable air conditioners receive zero stars on their Zoned Energy Rating Labels?

Single duct portables are the least efficient air conditioner to be covered by Greenhouse and Energy Minimum Standards (GEMS) legislation. These types of air conditioners receive zero stars on their Zoned Energy Rating Labels, because they have only a single exhaust duct, leading to unconditioned air being drawn into the conditioned space.

Retailers and consumers may wish to compare single duct products to other air conditioners. The Zoned Energy Rating Label will indicate that these products are less efficient (zero stars) and are more expensive to run (through the annual energy consumption figure). Different model single duct portable air conditioners can be compared with other single duct portables by comparing the capacity ratings and the annual energy consumption figures for each model.

6. How long will there be two types of energy rating labels for air conditioners in store?

Possibly up until March 2025.

Air conditioners can be registered under the old - 2013 - Determination up until the 31 March 2020. Registrations of units are valid for five years. If a unit is registered or renewed to the old Determination, they can only use the old energy rating label until they upgrade or renew to the new Determination.

Air conditioners may be registered under the new – 2019 – Determination now and, from 1 April 2020, may only be registered renewed under the 2019 Determination. Air conditioners registered under the 2019 Determination that display an energy rating label must display the Zoned Energy Rating Label.

7. What tools are available to calculate the size of air conditioner I require?

There are a number of online tools and sizing guides available on manufacturers' and retailers' websites. The Australian Government does not recommend any particular one.

Factors to bear in mind, when determining the right size of air conditioner, include not only the size (volume) of the room, but also the size and orientation of windows, the level of insulation and the amount of shading (internal and external). An uninsulated room with a large west facing window will require more cooling capacity, than a well insulated room with smaller north facing windows.

An air conditioning expert, such as a licensed installer will be able to give you more specific advice on the capacity of air conditioner that best meets your needs.

8. Why doesn't the label display the gas or refrigerant used in the air conditioner?

There is a limited amount of space on an energy rating label and the items that are displayed are those that are most likely to be of interest to consumers.

The refrigerant used in an air conditioner is recorded as part of the registration process and can be accessed through the CSV files that can be downloaded from the Registration Database on the energyrating.gov.au website. Column AV in the CSV file records the Refrigerant type used.

9. Is there a list of approved test facilities for measurements reported on the Zoned Energy Rating Label?

The Equipment Energy Efficiency (E3) Program does not mandate particular testing facilities. The facilities used should be capable of meeting the relevant test conditions and measuring results with sufficient accuracy to meet the requirements of the program.

10. How are the annual electricity consumption figures calculated?

There are several factors that go into calculating the annual energy consumption figures on the Zoned Energy Rating Labels. The three main ones are: the temperature profile of the climate zone; the assumed pattern of use of the air conditioner in response to that temperature pattern; and the electricity use by air conditioners at each temperature.

The temperature profiles for the zones are drawn from Nationwide Home Energy Rating Scheme (NatHERS) climate files. The figures for each zone are calculated based on climate file data for a specific site. For the Hot zone it is Rockhampton, for the Average zone it is Richmond (which is northwest of Sydney) and for the Cold zone it is Canberra. The climate files have hourly temperatures through the year, based on a typical meteorological year. The climate files used for these calculations are available through a link on the air conditioner part of the energyrating.gov.au website.

The assumptions about how the air conditioners are used include the set points for heating and cooling and the likelihood of use at any given temperature.

The Seasonal Energy Efficiency Rating (SEER) Standards use calculations based on data from the performance of the air conditioner at various test points and a series of assumptions to extrapolate power inputs and outputs at dry bulb temperature points in one degree increments.

The energy use figures are best used for comparison purposes between similar capacity models of air conditioners. Your actual annual energy use may vary from the energy use figure on the label. If Model A has a 20% higher kilowatt-hour figure than Model B, then the customer's air conditioner electricity usage will be in the order of 20% higher, if they buy Model A, rather than Model B. If someone uses their air conditioner a lot, then their annual usage figure is likely to be higher. While someone who only switches it on after the temperature gets above thirty or below 5 degrees outside will likely use less electricity than indicated on the label. However, even for these types of users, the Zoned Energy Rating Label figures will give a guide as to how much one model would use relative to another.

11. How are the noise levels calculated?

The noise tests are conducted in accordance with the relevant European Standard (either EN 12102:2013 or EN 12102-1:2017). The sound measurement must be conducted using the installation and operating conditions of the standard cooling full capacity test.

Note that the noise metric is sound power, which is the acoustical energy emitted by the sound source, and is an absolute value. It is not affected by the environment. This allows a consistent basis for comparison between air conditioning units.

12. Why are there two heating capacity numbers and what is the difference between them?

The short answer is that an air conditioner's ability to provide heating is affected by the outside air temperature and the 2°C capacity figure provides an indication of how the air conditioner responds to colder outside temperatures.

The longer answer is that there are several factors involved.

The heating capacity of an air conditioner varies depending on the outside air temperature and the amount of electricity that the air conditioner is drawing. Air conditioners are more efficient at heating when outside temperatures are warmer. For a given input of electricity, the heat output of an air conditioner is greater at 7°C outside temperature, than at 2°C. This means that for fixed

speed air conditioners (which are either drawing their full power or nothing), the heating capacity at capacity at 2°C will be lower than at 7°C.

Most of the air conditioners sold in Australia today use inverters, which allow them to draw varying amounts of power and operate at a range of capacities at a given temperature. The manufacturer of the air conditioner is not obliged to claim the maximum capacity their air conditioner is capable of achieving at the 7°C or 2°C temperatures on the energy rating label; they may choose to claim ("rate") their model at a lower capacity. There are various reasons why they might wish to do this. For example they may wish to market their air conditioner as being able to maintain its rated capacity even as the outside temperature drops. As long as the air conditioner is providing at least that level of heat output at the test temperature, the manufacturer can claim up to that heat output capacity. A consequence of this approach is that for air conditioners that use inverters, the capacity reported on the energy rating label at 2°C may be less than, equal to or more than the capacity at 7°C.

The heating capacity numbers do not provide information on how much electricity the air conditioner would be drawing to produce that level of heating. While the efficiency at the 7°C and 2°C test points is not captured in the capacity figures on the label, the efficiency of the air conditioner at the range of temperatures covered by the relevant climate files is captured in the star ratings.

The 2°C capacity numbers are included on the Zoned Energy Rating Label, because they can give an indication of how well the air conditioner will cope with frosting conditions. When the outside air temperature drops below about 5.5°C, the air conditioner's outside coils start getting frost on them. Air conditioners resolve this issue in different ways. If an air conditioner runs more defrost cycles where it switches off completely then that will lower its tested capacity at 2°C. If an air conditioner manages to defer defrost cycles, for example by increasing its outside fan speed to blow more moisture off the coils, then that will increase its tested capacity at 2°C.

13. When is New Zealand introducing these measures?

New Zealand is looking to implement these measures in a similar timeframe to Australia. The approvals process in New Zealand is different to Australia, so it is not possible to be definitive about start dates.