

# Draft FirstRate5 Whole of Home (v1.0.0) Manual

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## Overview of FirstRate5 Whole of Home

### Purpose of FirstRate5 Whole of Home

FirstRate5 Whole of Home is an online software tool that is used in conjunction with FirstRate5 to demonstrate compliance with the energy efficiency requirements in the National Construction Code 2022. FirstRate5 Whole of Home will calculate the Whole of Home Performance Rating that is contained in the [updated NatHERS Certificate](#). Once development is fully complete, users will be able to link whole of home assessments completed in FirstRate5 Whole of Home to project files uploaded to the FirstRate5 certificate portal and generate NatHERS Certificates which contain Whole of Home Performance Ratings.

Adding to the current NatHERS star rating assessment out of ten, the Whole of Home Performance Rating will be a separate rating out of 100. This rating is based on a dwelling's main fixed appliances (heating and cooling systems, hot water heaters, lighting, pool pumps) and solar panels and batteries.

More information about the NatHERS Whole of Home rating scheme can be found on the [NatHERS website](#).

### Limitations of FirstRate5 Whole of Home

Below is a list of the current limitations of FirstRate5 Whole of Home.

- Whole of Home NatHERS Certificate is not yet completely integrated with the FirstRate5 website and NatHERS Certificates cannot be generated. This functionality will be added in the early 2024.
- FirstRate5 Whole of Home does not include an option for a PV diverter water heater at this stage. This type of system uses spare capacity from a rooftop PV system to heat water in an electric storage water heater. If an assessment contains a PV diverter water heater the default water heater specified in the current [NatHERS Technical Note](#) should be used instead.

## Getting started & managing files and assessments

### Steps to complete a Whole of Home assessment

To complete a Whole of Home assessment you will need to complete the following step.

1. Upload the FirstRate5 project file you want to complete a Whole of Home assessment for into your FirstRate5 account.
2. Once the FirstRate5 website has finished processing the file, login to FirstRate5 Whole of Home and import the file. You will only be able to import projects files that have been created in version FR5 v5.5.3 or later and are in the 'Certificate Available' or 'Replacement Available' status.
3. After the project has been successfully imported into FirstRate5 Whole of Home, you will need to enter the project record and specify the required appliance, solar PV system and battery details.
4. When you have completed specifying the required details click on 'Save and update'. The project results will be updated and saved.

Please note that at this stage the development of certificate generation process has not been completed and you will not be able to create a NatHERS Certificate with a completed Whole of Home assessment. This functionality will be added in early 2024.

### Minimum details required for a Whole of Home assessment

When completing a Whole of Home assessment, the ideal situation is where all required details for appliances and solar PV/battery systems are specified on the design documentation.

In situation where this is not the case, users must refer to the current [NatHERS Technical Note](#) for the appropriate default appliances to use when appliance or system information is unknown.

At minimum, the following information will need to be specified in FirstRate5 Whole of Home for a valid Whole of Home Performance Rating to be calculated.

- Water Heating
- Cooking Equipment
- Societal Cost Options (i.e., building class)

Users should note that FirstRate5 Whole of Home automatically assigns the correct default heater and cooler to all zones when none are specified in the assessment.

### NatHERS Technical Note

You should refer to the [current NatHERS Technical Note](#) for information about how to complete a Whole of Home assessment. This will be particularly important if you do not have the required information to complete an assessment and need to use default settings for appliances.

## How to Login to FirstRate5 Whole of Home

To use the FirstRate5 Whole of Home you must have a FirstRate5 account. Follow the steps below to login.

1. Go the following URL - <https://woh.frplus.au>.
2. Click on 'Log in via FirstRate5' and enter your FirstRate5 user credentials to complete the login process.

## Importing a FirstRate5 file

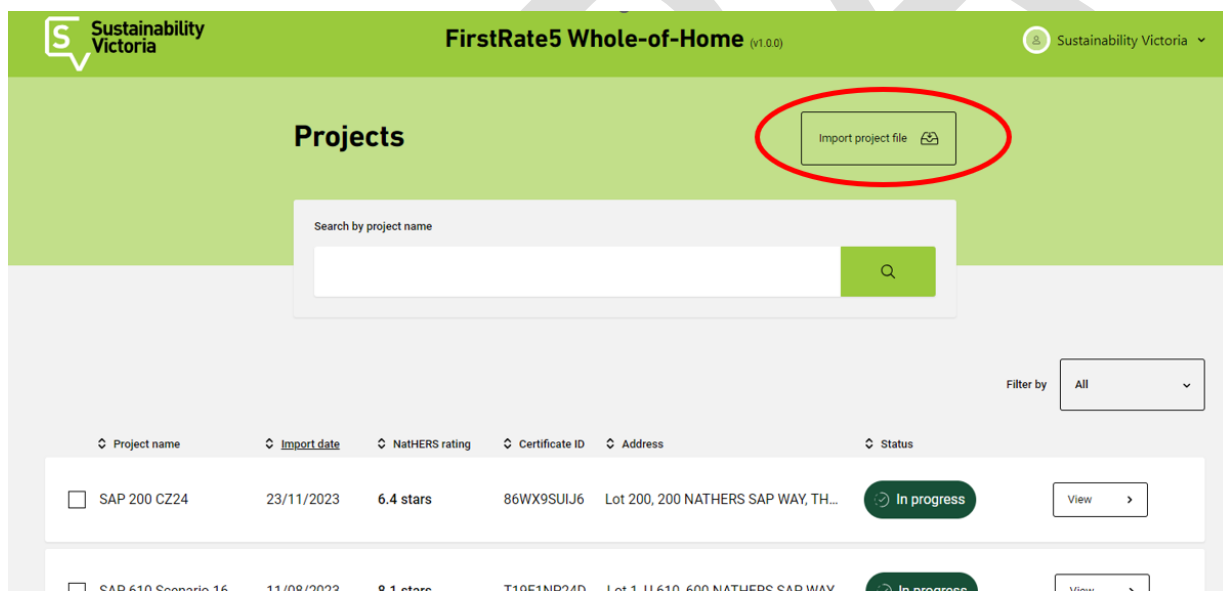
You can import projects into two ways: 1) through FirstRate5 Whole of Home: 2) and directly from the FirstRate5 website.

### Importing projects through FirstRate5 Whole of Home

After you login to FirstRate5 Whole of Home, you will be taken to the Projects page. This is the main dashboard and contains a list of all your projects that have been imported including basic information, such as project name, address, status, certificate ID and NatHERS rating.

To import a project, the FirstRate5 file must first be uploaded to your FirstRate5 account. You will only be able to import projects files that have been created in version FR5 v5.5.3 or later and are in the 'Certificate Available' or 'Replacement Available' status.

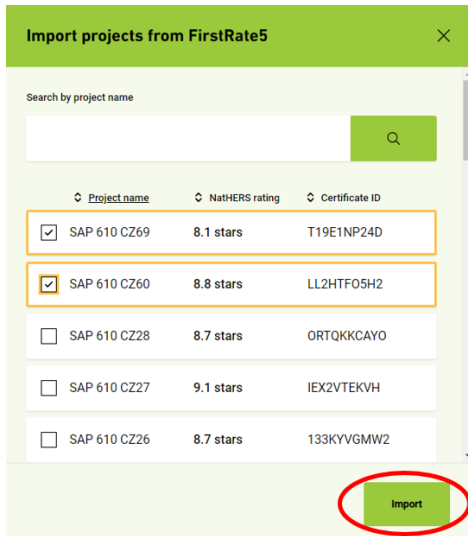
On the Projects page, click 'Import project file' to see a list of FR5 projects available for use in the Pilot Tool. You can use the search function to find your project in the list.



The screenshot shows the 'Projects' page in the FirstRate5 Whole-of-Home interface. The page features a green header with the Sustainability Victoria logo and the text 'FirstRate5 Whole-of-Home (v1.0.0)'. A red circle highlights the 'Import project file' button. Below the header is a search bar with the placeholder text 'Search by project name' and a green search button. To the right of the search bar is a 'Filter by' dropdown menu set to 'All'. Below the search bar is a table of projects with columns for Project name, Import date, NATHERS rating, Certificate ID, Address, and Status. The table contains two rows of project data.

Project name	Import date	NATHERS rating	Certificate ID	Address	Status
SAP 200 CZ24	23/11/2023	6.4 stars	86WX9SUIJ6	Lot 200, 200 NATHERS SAP WAY, TH...	In progress
SAP 610 Scenario 16	11/08/2023	8.1 stars	T10E1ND24D	Lot 1 11610 600 NATHERS SAP WAY	In progress

Once the import project dialogue box is open, select the project/s you want to upload and click 'Import'. The import process takes between 2-5 minutes as the imported project needs to be simulated twice to generate the necessary heating and cooling load data. Please note that the import list will not show projects that have been uploaded to the FirstRate5 website after you have logged into FirstRate5 Whole of Home. You will need to log in and out of FirstRate5 Whole of Home to refresh the import list.



### Importing project through the FirstRate5 website

When you are logged into your FirstRate5 user account, at the top of a project's 'Jobs Details' page you will see a button named 'Create WoH assessment'. When you click this button the import process will be started, and you will see the project importing into FirstRate5. Once the import process is complete, the button will change to 'View WoH assessment/s'.

Please note that this functionality will only be available for projects files that have been created in version FR5 v5.5.3 or later and are in the 'Certificate Available' or 'Replacement Available' status.



## Project statuses

There are four statuses a Whole of Home assessment can be in.

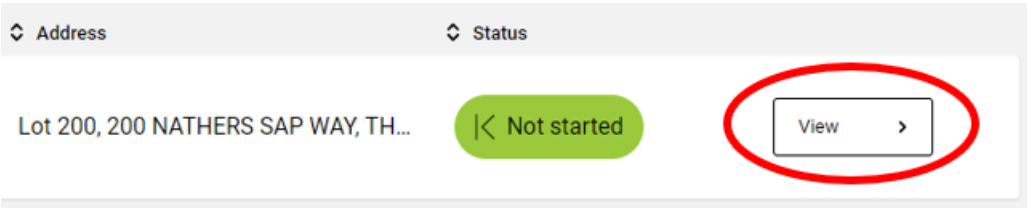
- **Importing:** The 'Importing' status will be displayed when the project is being imported from the FirstRate5 website.
- **Not started:** After the project has been successfully imported, it will be in the 'Not started' status.
- **In progress:** Once you have started editing a project, it will be in the 'In progress' status.
- **Sent:** The 'Sent' status will be displayed once you have clicked the 'Send assessment to finalise my certificate' button in the Summary page. This means the details of this Whole of Home assessment has been sent to the FirstRate5 website and a NatHERS Certificate will be able to be generated when this functionality has been added to the FirstRate5 website. The file is temporarily locked when it is in the 'Sent' status.

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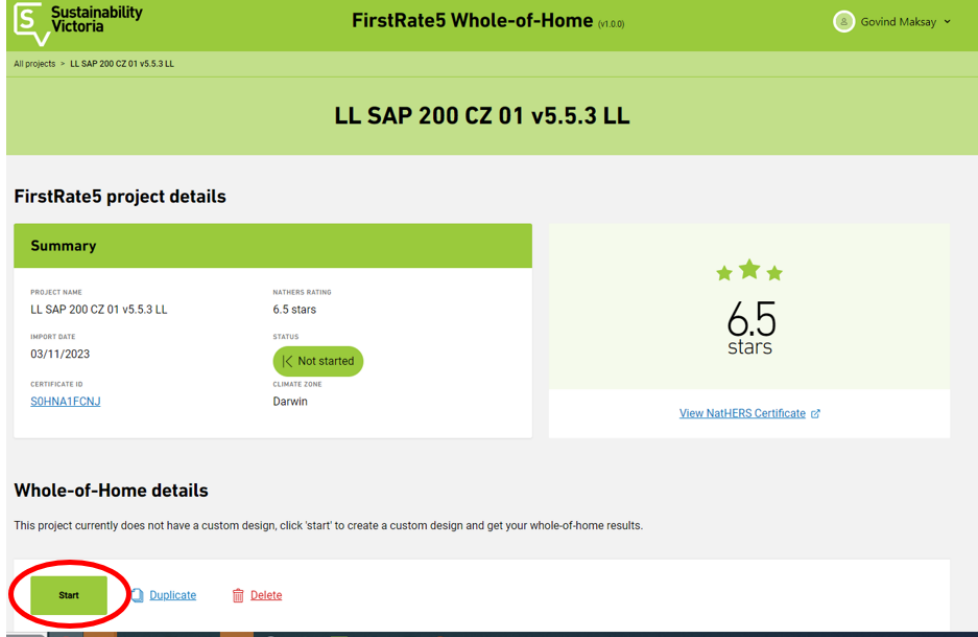


# Starting and saving a Whole of Home assessment

Once you have imported a project in FirstRate5 Whole of Home, it will be in the 'Not started' status. Click 'View' on the righthand side of a project to view or start a Whole of Home assessment.



You will first enter the Summary page. Initially this page will only provide the basic details of the FirstRate5 project file only. There are no appliance details as these will need to be entered in the next step. Click on the green 'Start' button to enter the Edit page.



In the Edit page, inputs are on the left and results/analytics are on the right. When you first enter Edit mode, no choices will have been selected for heating and cooling, fixed appliances, swimming pool, solar PV, and battery storage. Lighting is set to the default value (5W/m2) and plug-in appliances are fixed. Begin entering in data in these sections and click the 'Save and update' button at the bottom of the page to update the results on the right of the page. Refer to the [Analytics and Summary Information](#) section for more information about the results presented in FirstRate5 Whole of Home. Once you have finished and saved the assessment, click on the 'Next' button at the bottom of the page to return to the project Summary page.

The screenshot displays the 'FirstRate5 Whole-of-Home' interface. The left panel, titled 'Specify appliance/system details', is for configuring a heater. It lists 'Conditioned zones' including WIR 5, ENS 5, ENTRY, WIR 1, BED 3, KITCHEN/MEALS, LIVING, HALL, BED 1, BED 4, BED 5, LOUNGE, BED 2, ENS 1, and WC. Under 'Heater 1', the 'System category' is set to 'Room' and the 'Heater type' is 'Select option'. At the bottom, the 'Next', 'Save and update', and 'Clear inputs' buttons are circled in red. The right panel, titled 'Results and analytics', shows a current score of 52 / 150 on a performance scale from 0 to 150. It also displays 'Annual greenhouse gas emissions' with a 'Debt' of 5.32 tonnes, 'Offsets' of 0.00 tonnes, and 'Net Emissions' of 5.32 tonnes. A red banner indicates '100% of emissions offset?' with a 'No' selection. Below, 'Annual costs' for 'Heating and cooling' are shown as \$522.

# Deleting a Whole of Home assessment

You can delete an assessment by clicking the 'Delete' icon on the project Summary page.

The screenshot shows the 'FirstRate5 project details' page for a project named 'SAP 200 CZ 60 v5.5.3 LL'. The page is divided into several sections:

- Summary:** A table with project details:

PROJECT NAME	SAP 200 CZ 60 v5.5.3 LL	NATHERS RATING	6.4 stars
IMPORT DATE	03/11/2023	STATUS	In progress
CERTIFICATE ID	<a href="#">RJTMM05DWV-10</a>	CLIMATE ZONE	Tullamarine
- Rating:** A green box showing '6.4 stars' with three stars above the number and a link to 'View NatHERS Certificate'.
- Whole-of-Home details:** A section with a green header 'Heating and cooling' and a score of 'Your current score is 52 / 150'.
- Actions:** A row of buttons at the bottom: 'Download PDF summary', 'Edit design', 'Duplicate', 'Delete' (circled in red), and 'Send assessment to finalise my certificate'.

You can also delete multiple projects in one action by selecting multiple assessment on the Projects page.

<input checked="" type="checkbox"/>	TEST 1	08/11/2023	6.4 stars	RJTMM05DWV-11	Lot 200, 200 NATHERS SAP WAY, TH...	In progress	View >
<input checked="" type="checkbox"/>	TEST	08/11/2023	6.4 stars	RJTMM05DWV-11	Lot 200, 200 NATHERS SAP WAY, TH...	In progress	View >
<input checked="" type="checkbox"/>	SAP 200 CZ26 v5.5.0	03/11/2023	6.4 stars	RJTMM05DWV-11	Lot 200, 200 NATHERS SAP WAY, TH...	In progress	View >
<input type="checkbox"/>	SAP 200 CZ 60 v5.5.0	03/11/2023	6.4 stars	RJTMM05DWV-11	Lot 200, 200 NATHERS SAP WAY, TH...	In progress	View >

3/3 projects selected for comparison

Clear selections **Delete projects** Compare

# Duplicating a Whole of Home assessment

You can duplicate an existing Whole of Home assessment by clicking 'Duplicate' on the project Summary page. This process generates a duplicate of the heating and cooling loads and all appliance selections.

You need to enter the new project name. Please note that you cannot change the project name after the project has been duplicated.

The screenshot shows the 'FirstRate5 Whole-of-Home' project summary page. At the top, the Sustainability Victoria logo is on the left, and the user name 'Govind Maksay' is on the right. The main header displays 'SAP 200 CZ 60 v5.5.3 LL'. Below this, the 'FirstRate5 project details' section includes a 'Summary' card with the following information:

PROJECT NAME	NATHERS RATING
SAP 200 CZ 60 v5.5.3 LL	6.4 stars
IMPORT DATE	STATUS
03/11/2023	In progress
CERTIFICATE ID	CLIMATE ZONE
RJTMM05DWV-10	Tullamarine

To the right of the summary card, there is a large green box displaying '6.4 stars' with three stars above it and a link to 'View NatHERS Certificate'. Below the summary card, the 'Whole-of-Home details' section is visible, with 'Heating and cooling' selected. A white box shows 'Your current score is 52 / 150'. At the bottom, there are four buttons: 'Download PDF summary', 'Edit design', 'Duplicate' (circled in red), and 'Delete'. A blue button on the right says 'Send assessment to finalise my certificate'.

# Generating PDF project summary

You can download a summary of a Whole of Home assessment by clicking the 'Download PDF summary' on the project Summary page. The PDF will present a summary of all the appliance/system information you have specified in the Whole of Home assessment and the main metrics. This PDF report cannot be used for compliance purposes and cannot replace a NatHERS Certificate generated by the FirstRate5 website.

**Sustainability Victoria** **FirstRate5 Whole-of-Home** (v1.0.0) Govind Maksay

All projects > SAP 200 CZ 60 v5.5.3 LL

## SAP 200 CZ 60 v5.5.3 LL

### FirstRate5 project details

Summary	
PROJECT NAME SAP 200 CZ 60 v5.5.3 LL	NATHERS RATING 6.4 stars
IMPORT DATE 03/11/2023	STATUS <b>In progress</b>
CERTIFICATE ID <a href="#">RJTMM05DWV-10</a>	CLIMATE ZONE Tullamarine

6.4 stars  
[View NatHERS Certificate](#)

### Whole-of-Home details

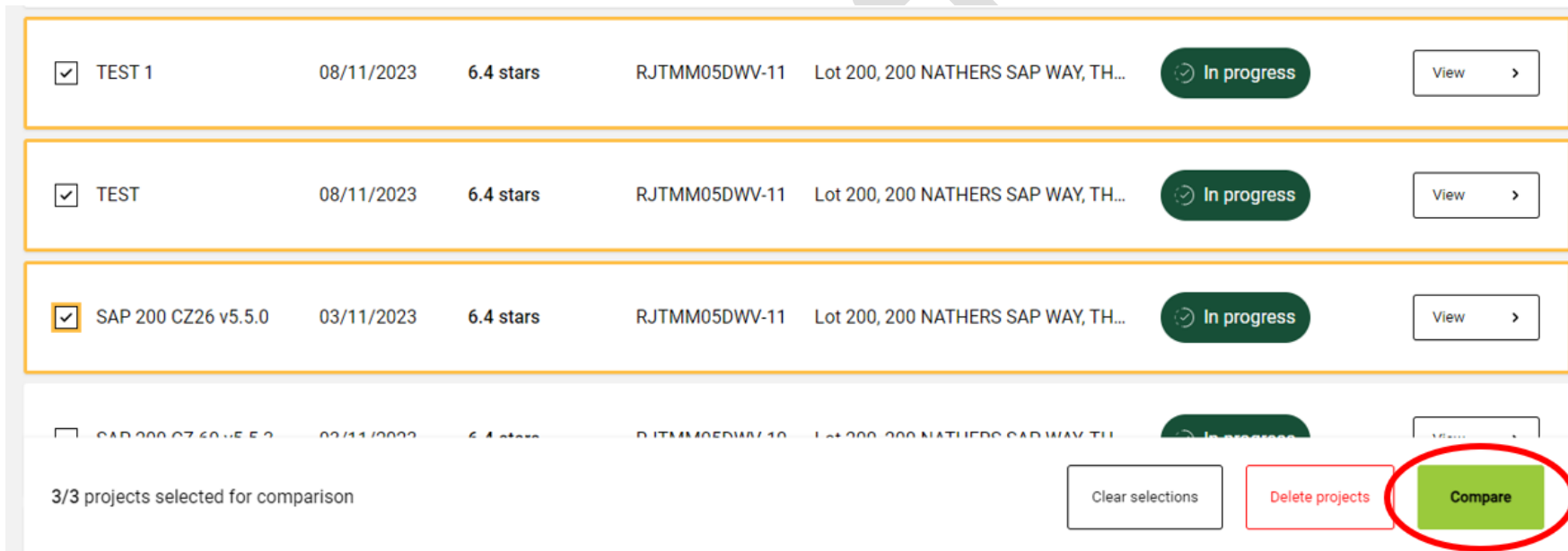
**Heating and cooling** Your current score is 52 / 150

[Download PDF summary](#) [Edit design](#) [Duplicate](#) [Delete](#) [Send assessment to finalise my certificate](#)

## Comparing assessments

On the Projects page, you can compare up to three assessment side-by-side. The compare function can be useful for comparing a standard house design with a high efficiency one, or for comparing different appliance packages for the same house.

First select the three projects you want to compare and then click Compare.



The screenshot displays a list of projects with the following details:

Project Name	Date	Stars	Project ID	Address	Status	Action
<input checked="" type="checkbox"/> TEST 1	08/11/2023	6.4 stars	RJTM05DWV-11	Lot 200, 200 NATHERS SAP WAY, TH...	In progress	View >
<input checked="" type="checkbox"/> TEST	08/11/2023	6.4 stars	RJTM05DWV-11	Lot 200, 200 NATHERS SAP WAY, TH...	In progress	View >
<input checked="" type="checkbox"/> SAP 200 CZ26 v5.5.0	03/11/2023	6.4 stars	RJTM05DWV-11	Lot 200, 200 NATHERS SAP WAY, TH...	In progress	View >
<input type="checkbox"/> SAP 200 CZ 60 v5.5.0	03/11/2023	6.4 stars	RJTM05DWV-11	Lot 200, 200 NATHERS SAP WAY, TH...	In progress	View >

At the bottom of the list, there are three buttons: 'Clear selections', 'Delete projects', and 'Compare'. The 'Compare' button is highlighted with a red circle. A status message '3/3 projects selected for comparison' is visible on the left side of the button area.

After you have generated a comparison by clicking the 'Compare' button, you can download a PDF report by clicking the 'Download PDF' button in the top right corner.

## Generating a NatHERS Whole of Home Certificate

At this stage the certificate generation process has not been completed. This section will be updated once this functionality has been added.

## Heaters

### Type of heaters available

FirstRate5 Whole of Home includes a range of common heating options, including various types of central heating and room heating. Central heating systems can heat a whole house or large areas of a house, while a room heater can heat a single room or open plan area. In some cases, a house might use a central heating system for the main living areas, and a room heater for other areas of the home. The available heater options are shown in the table below, along with the main fuel (electricity, gas, LPG or wood) used by each heating type and the way in which the efficiency level is specified.

Heater Type	Central / Room	Efficiency Level	Main Fuel
Ducted reverse-cycle air conditioner (fixed or variable capacity)	Central	Star rating – old or new ACOP or HSPF	Electricity
Multi-split reverse-cycle air conditioner (fixed or variable capacity)	Central	Star rating – old or new ACOP or HSPF	Electricity
Ducted gas	Central	Star rating	Natural gas or LPG
Ducted electric resistance	Central	Fixed value (%)	Electricity
Ducted slow combustion	Central	Efficiency (%)	Wood
Room reverse-cycle air conditioner (fixed or variable capacity)	Room	Star rating – old or new ACOP or HSPF	Electricity
Gas room heating	Room	Star rating	Natural gas or LPG
Electric resistance – without fan	Room	Fixed value (%)	Electricity
Electric resistance – with fan	Room	Fixed value (%)	Electricity
Slow combustion – without fan	Room	Efficiency (%)	Wood
Slow combustion – with fan	Room	Efficiency (%)	Wood



## Adding heaters and selecting zones

When you start a new assessment, you will need to first click the 'Add heater' button located under the Heating banner to get started. You can add as many heaters as necessary to an assessment.

For each heater added you will need to specify the system category, the heater type, the required efficiency information, and the zones that are serviced by the heater. The available zones will automatically be copied across from the linked FirstRate5 project. The 'Duplicate heater' button will copy the selected heater.

### Heater 1 Hide details ^

System category After you select the heater you want to specify the required efficiency information will be displayed.

A room heater services a single room or an open plan area. A central heating system services large areas of a home.

Select option

Heater type



Select option

Select zones serviced by this heater

All rooms  BEDROOM

KITCHEN/LIVING  ENSUITE

WIR All zones available will be displayed here. If zones are already allocated to another heater, they will not be selectable.

 Duplicate heater  Delete heater



Click this button to add additional heaters

## Use of default heaters

Any unallocated zones in a dwelling will be allocated to the default heater when the whole of home rating is calculated. Refer to the current [NatHERS Technical Note](#) for further information about the default heater used for the different NatHERS climate zones.

In the design documentation, if heaters have not been specified for the entire house or specific zones, do not specify any heaters. FirstRate5 Whole of Home will automatically assign the correct default heater for the NatHERS climate zone the assessed dwelling is located in, and the heater will be correctly listed as a default cooler on the NatHERS certificate.

## How to gather heater efficiency information

Depending on the heater/s you specify in the assessment, you will need to gather different types of heater efficiency information to enter into FirstRate5 Whole of Home. Refer to each individual heater type to see the type of efficiency information required.

The recommended approach is to obtain the necessary efficiency information directly from the builder, building designer or product supplier you are working with. In many cases they should be able to supply with product brochures and specification documents that will simplify the process.

Where this is not possible, you will need to search product databases for the necessary efficiency information using heater model numbers. This approach can be more difficult because sometimes manufactures do not use consistent model numbers and you may not be able to find an exact match in the online product database. Also, the data contained in online databases can be complex and you will need ensure you are properly trained to interpret the information you gather.

## Interpreting energy labels for air conditioners

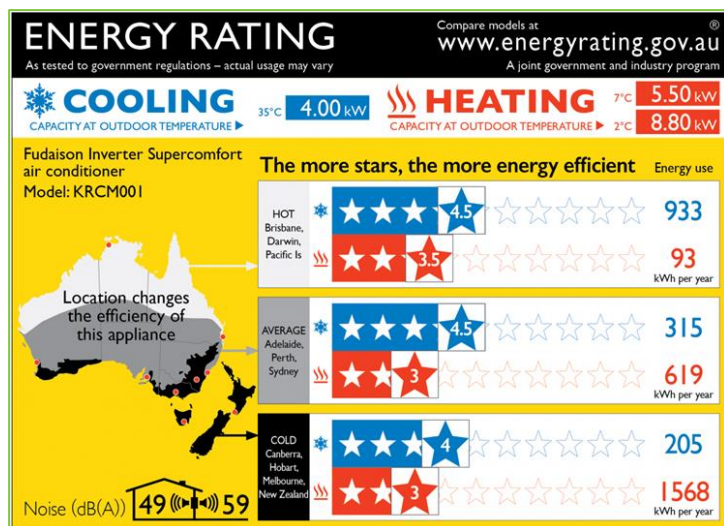
Reverse-cycle and refrigerative air conditioners (ducted, multi-split and room) are tested and rated for their energy efficiency to allow you to compare the performance of different models, and FirstRate5 Whole of Home requires you to select the energy efficiency level if you specify this type of heating. There are currently two rating schemes operating for air conditioners, and you will need to select the appropriate one in the 'Efficiency rating' section of the heater specification panel. For more information on air conditioner energy efficiency ratings visit the [Energy Rating website](#).

### New Rating Scheme

From April 2020, all new air conditioner models are required to have a Zoned Energy Rating (ZER), and these can differ by climate zone. Australia has been split into cold, average, and hot climate zones. The ZER provides a rating from 1 to 10 Stars; the higher the rating the more efficient the air conditioner is. The ratings of all air conditioners on the market are available on the [Australian Government's Energy Rating website](#). You can search this list by type of air conditioner, brand and model number.

Where the air conditioners have a ZER, the heating ratings are shown as the "SEER Heating Star Rating", with ratings provided for the cold, average (or mixed) and hot climate zones. The ZERs are based on the Heating Seasonal Performance Factor (HSPF) of the air conditioner measured in a laboratory test. The HSPF is the ratio of the total heat output divided by the total electricity consumption of the air conditioner over a typical heating season. The HSPF value would normally be provided in the supplier's model specification, either on-line or in the product brochure. It is also available in lists of registered products that can be downloaded as a CSV file for the from the [Australian Government's Energy Rating website](#) (scroll to the bottom of the page to find the 'Download CSV' button).

In FirstRate5 Whole of Home you specify the efficiency of air conditioners that use the new rating scheme by selecting the appropriate HSPF or star rating.

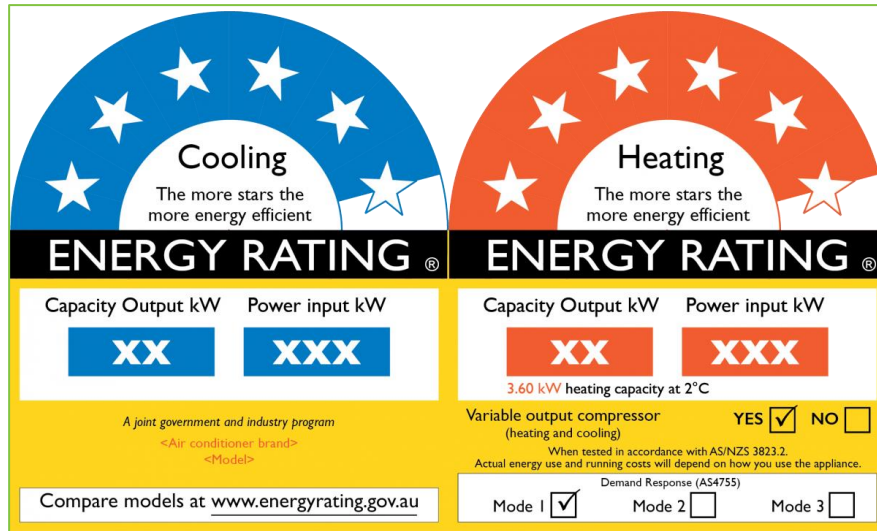


### Old Rating Scheme

The old rating scheme applies to air conditioner models that came onto the market *before* April 2020. In this case, the air conditioners had their efficiency measured for only one climate zone and, rather than a seasonal energy efficiency rating used for the new rating, it was based on their rated operating point. The provision of an energy rating for ducted systems was voluntary, and most ducted systems did not have one. The old rating scheme provides a rating from 1 to 10 Stars; the higher the rating the more efficient the air conditioner is. The ratings of all air conditioners on the market are available on the [Australian Government's Energy Rating website](http://www.energyrating.gov.au). You can search this list by type of air conditioner, brand and model number. Note that some air conditioners with these old ratings are expected to remain in the market until around 2024.

The old rating scheme was based on the Annual Coefficient of Performance (ACOP). The ACOP is the ratio of the heat output to the electrical power input when the air conditioner is operating at rated capacity. The ACOP value would normally be provided in the supplier's model specification, either on-line or in the product brochure. It is also available in lists of registered products that can be downloaded as a CSV file for the from the [Australian Government's Energy Rating website](http://www.energyrating.gov.au) (scroll to the bottom of the page to find the 'Download CSV' button).

In FirstRate5 Whole of Home you specify the efficiency of air conditioners that use the old rating scheme by selecting the appropriate ACOP or star rating.



## Fixed and variable capacity air conditioners

In FirstRate5 Whole of Home, when you select a reverse-cycle or refrigerative air conditioners (ducted, multi-split and room) you will need to specify if it is fixed capacity or variable capacity.

A variable capacity air conditioner has a variable speed drive, which enables the compressor to run at a range of speeds from slow to fast, to match the output required. This feature improves the energy efficiency performance of the unit. A fixed capacity air conditioner runs at a constant speed and varies its capacity by switching on and off at different intervals. This type of air conditioner is less energy efficient than a variable capacity unit.

You will be able to find out if an air conditioner is fixed capacity or variable capacity by referring to heater specification documents or by finding model information on the [Energy Rating product database](#).

## Specifying heaters: Ducted reverse-cycle air conditioner (fixed or variable capacity)

Ducted reverse-cycle air conditioners provide both heating and cooling for a whole home, or for large areas of a home. A compressor unit is located outside the house, and this is connected via refrigerant piping to an indoor fan-coil unit located in the roof space which contains a heat exchanger and an air distribution fan. The heated (or cooled) air is distributed to ceiling outlets in different rooms via insulated ductwork and is drawn back in through a return-air grille and brought back to the indoor fan-coil unit to be re-heated (or cooled).

Follow the steps below to enter the necessary information for a ducted reverse cycle air conditioner. The ratings of all air conditioners on the market are available on the [Australian Government's Energy Rating website](#). You can search this list by type of air conditioner, brand and model number.

Please note that if you have already specified a ducted refrigerative air conditioner as a cooler, you will specify the same system as the heater.

### Steps

1. Select 'Central' from the dropdown menu for 'System category'.
2. Select 'Ducted RAC – fixed capacity' or 'Ducted RAC – variable capacity'. Refer to the section [Fixed and variable capacity air conditioners](#) for further information.
3. In most cases you will leave the age of ductwork set as 'Less than 10 years'. You should only change this value if you are assessing an existing house and you do not intend to generate a NatHERS Certificate.
4. Select 'Old rating' or 'New rating'. Refer to the section [Interpreting energy labels for air conditioners](#) for further information.
5. Specify the efficiency level of ducted reverse-cycle air conditioner using the slider. Both the Star rating and the HSPF (new rating) or ACOP (old rating) values change as the slider is adjusted. You can specify the efficiency by star rating or HSPF/ACOP. If you select 'New rating' the rating climate zone (i.e., cold, average/mixed or hot) is displayed underneath the slider to assist you with identifying the correct zoned energy rating (ZER) for the heater. Refer to the section [Interpreting energy labels for air conditioners](#) for further information.
6. Enter the rated capacity for the heater in kW. This is an optional field and will appear in the PDF summary generated by the tool. This value will not appear in the NatHERS Certificate.
7. Select the zones that are serviced by the heater.

## Heater 1

1kW - Ducted RAC - fixed capacity

[Hide details](#) ^

### System category

A room heater services a single room or an open plan area. A central heating system services large areas of a home.

Central

### Heater type

Ducted RAC - fixed capacity

### Age of ductwork

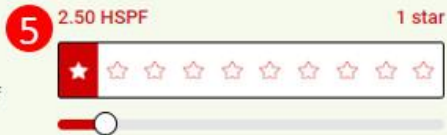
Less than 10 years

### Efficiency rating

- Old rating  
 New rating

### Efficiency

Use the slider to enter the efficiency rating of your heating.



Use the rating for the Cold climate zone.

### Capacity

Max. hourly heating demand is 0.0kW

1

kW

### Select zones serviced by this heater

- |   |  |
|---|--|
| <input type="checkbox"/> All rooms                | <input checked="" type="checkbox"/> WIR 5  |
| <input checked="" type="checkbox"/> KITCHEN/MEALS | <input checked="" type="checkbox"/> BED 5  |
| <input checked="" type="checkbox"/> ENS 5         | <input checked="" type="checkbox"/> LIVING |

## Specifying heaters: Multi-split reverse-cycle air conditioner (fixed or variable capacity)

Multi-split reverse cycle air conditioners cool multiple rooms using only one outdoor unit connected to multiple indoor units. Each indoor unit can also be individually controlled, scheduled and set to the desired room temperature.

Multi-split systems are composed of multiple indoor units and a single outdoor unit, connected by refrigerant piping. The outdoor unit houses the compressor and the condenser – the key working parts of the air conditioner - while the indoor units have a heat exchanger and fan to blow the cooled air around the room. Most indoor units are wall mounted, although floor and ceiling mounted units may also be available.

Follow the steps below to enter the necessary information for a multi-split reverse cycle air conditioner. The ratings of all air conditioners on the market are available on the [Australian Government's Energy Rating website](#). You can search this list by type of air conditioner, brand and model number.

Please note that if you have already specified a multi-split refrigerative air conditioner as a cooler, you will specify the same system as the heater.

### Steps

1. Select 'Central' from the dropdown menu for 'System category'.
2. Select 'Multi-split RAC – fixed capacity' or 'Multi-split RAC – variable capacity'. Refer to the section [Fixed and variable capacity air conditioners](#) for further information.
3. Select 'Old rating' or 'New rating'. Refer to the section [Interpreting energy labels for air conditioners](#) for further information.
4. Specify the efficiency level of ducted reverse-cycle air conditioner using the slider. Both the Star rating and the HSPF (new rating) or ACOP (old rating) values change as the slider is adjusted. You can specify the efficiency by star rating or HSPF/ACOP. If you select 'New rating' the rating climate zone (i.e., cold, average/mixed or hot) is displayed underneath the slider to assist you with identifying the correct zoned energy rating (ZER) for the heater. Refer to the section [Interpreting energy labels for air conditioners](#) for further information.
5. Enter the rated capacity for the heater in kW. This is an optional field and will appear in the PDF summary generated by the tool. This value will not appear in the NatHERS Certificate.
6. Select the zones that are serviced by the heater.

## Heater 1

1kW - Multi-split RAC - fixed capacity [Hide details](#) ^

---

**System category**  
A room heater services a single room or an open plan area. A central heating system services large areas of a home.

Central 1

**Heater type**  
Multi-split RAC - fixed capacity 2

**Efficiency rating**  
 Old rating 3  
 New rating

2.50 HSPF 1 star

**Efficiency**  
Use the slider to enter the efficiency rating of your heating. 4

★ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆  
Use the rating for the Cold climate zone.

**Capacity**  
Max. hourly heating demand is 0.0kW

1 kW 5

---

Select zones serviced by this heater

<input type="checkbox"/> All rooms	<input checked="" type="checkbox"/> WIR 5 <span>6</span>
<input checked="" type="checkbox"/> KITCHEN/MEALS	<input checked="" type="checkbox"/> BED 5
<input checked="" type="checkbox"/> ENS 5	<input checked="" type="checkbox"/> LIVING



## Specifying heaters: Ducted gas heater

Ducted gas systems consist of a gas furnace to heat the air, and an air circulation fan and ductwork to distribute the heated air to the different rooms of the house. The heated air that is blown into the home is drawn back through a return air grille, to be reheated in the furnace. The gas furnace can be located outside on the ground, in the roof-space, and sometimes in a cupboard. In addition to gas, ducted gas heaters use a reasonable amount of electricity, mainly to power the air circulation fan.

Follow the steps below to enter the necessary information for a ducted gas heater. The star rating of gas ducted heaters can be found in product specification documents or in the [Australian Gas Association product directory](#).

### Steps

1. Select 'Central' from the dropdown menu for 'System category'.
2. Select 'Ducted gas' from the dropdown menu.
3. Select if the appliance uses natural gas or LPG.
4. In most cases you will leave the age of ductwork set as 'Less than 10 years'. You should only change this value if you are assessing an existing house and you do not intend to generate a NatHERS Certificate.
5. Specify the efficiency level in stars using the slider.
6. Enter the rated capacity for the heater in kW. This is an optional field and will appear in the PDF summary generated by the tool. This value will not appear in the NatHERS Certificate.
7. Select the zones that are serviced by the heater.

# Heater 1

15kW - Ducted gas

[Hide details](#) ^

## System category

A room heater services a single room or an open plan area. A central heating system services large areas of a home.

Central

## Heater type

Ducted gas

## What type of gas?

Natural gas

## Age of ductwork

Less than 10 years

## Efficiency

Use the slider to enter the efficiency rating of your heating.



## Capacity

Max. hourly heating demand is 12.7kW

15 kW

## Select zones serviced by this heater

- |   |  |
|---|--|
| <input type="checkbox"/> All rooms                | <input checked="" type="checkbox"/> WIR 5  |
| <input checked="" type="checkbox"/> KITCHEN/MEALS | <input checked="" type="checkbox"/> BED 5  |
| <input checked="" type="checkbox"/> ENS 5         | <input checked="" type="checkbox"/> LIVING |

## Specifying heaters: Ducted electric resistance heater

Ducted electric resistance heaters consist of an electric element to produce heat, and an air circulation fan and ductwork to distribute the heated air to the different rooms of the house. The heated air that is blown into the home is drawn back through a return air grille, to be reheated by the electric element. The electric element is usually located in in-line with the ductwork. Ducted electric resistance heating is not very common in Australia.

Follow the steps below to enter the necessary information for a ducted electric resistance heater.

### Steps

1. Select 'Central' from the dropdown menu for 'System category'.
2. Select 'Ducted electric resistance' from the dropdown menu.
3. In most cases you will leave the age of ductwork set as 'Less than 10 years'. You should only change this value if you are assessing an existing house and you do not intend to generate a NatHERS Certificate.
4. The efficiency is set to 85% can cannot be varied.
5. Enter the rated capacity for the heater in kW. This is an optional field and will appear in the PDF summary generated by the tool. This value will not appear in the NatHERS Certificate.
6. Select the zones that are serviced by the heater.

## Heater 1

15kW - Ducted electric resistance

[Hide details](#) ^

### System category

A room heater services a single room or an open plan area. A central heating system services large areas of a home.

Central

1

### Heater type

Ducted electric resistance

2

### Age of ductwork

Less than 10 years

3

### Efficiency

Default value

85 %

4

### Capacity

Max. hourly heating demand is 12.7kW

15 kW

5

### Select zones serviced by this heater

6

All rooms

WIR 5

KITCHEN/MEALS

BED 5

ENS 5

LIVING

## Specifying heaters: Ducted slow combustion heater

Slow combustion wood heaters burn wood in an enclosed firebox in a way that allows the flow of combustion air to be regulated, meaning that they are much more efficient than an open wood fire. Room air is drawn around the firebox, either by natural convection or by a fan, and flows into the room to be heated. They are normally used to heat large open plan areas. In some cases, a “heat shifter” – insulated ductwork with an in-line fan – is used to move the heated air into other parts of the house, allowing the heaters to operate more like a ducted heating system. Wood is the main fuel used by the heater, although heaters with air circulation fans and/or that use heat shifters will also use some electricity.

In Australia, slow combustion wood heaters are required to be tested and certified according to Australian Standard *AS/NZS4012 Domestic solid fuel burning appliances – method for determination of power output and efficiency and tested using Hardwood fuel*. This standard is used to measure the rated heat output of the heaters in kilowatts (kW) and their efficiency as a percentage. To be legally sold they must achieve a minimum efficiency of 60% and meet certain particulate (smoke) emission requirements.

Follow the steps below to enter the necessary information for a ducted slow combustion heater.

### Steps

1. Select ‘Central’ from the dropdown menu for ‘System category’.
2. Select ‘Ducted slow combustion’ from the dropdown menu.
3. In most cases you will leave the age of ductwork set as ‘Less than 10 years’. You should only change this value if you are assessing an existing house and you do not intend to generate a NatHERS Certificate.
4. The efficiency is certified to AS/NZS4012 and can be set between 60 percent to 90 percent using the slider.
5. Enter the rated capacity for the heater in kW. This is an optional field and will appear in the PDF summary generated by the tool. This value will not appear in the NatHERS Certificate.
6. Select the zones that are serviced by the heater.

# Heater 1

15kW - Ducted slow combustion

[Hide details](#) ^

## System category

A room heater services a single room or an open plan area. A central heating system services large areas of a home.

Central

## Heater type

Ducted slow combustion

## Age of ductwork

More than 10 years

## Efficiency

Use the slider to enter the efficiency rating of your heating.

60 %



Efficiency certified to AS/NZS4012. Set to 60% if unknown

## Capacity

Max. hourly heating demand is 12.7kW

15 kW

## Select zones serviced by this heater

All rooms

WIR 5

KITCHEN/MEALS

BED 5



1

2

3

4

5

6

## Specifying heaters: Room reverse-cycle air conditioner (fixed or variable capacity)

Room reverse-cycle air conditioners can heat and cool a single room or open plan area and come as split systems or window wall units. Split systems are composed of an indoor unit and an outdoor unit, connected by refrigerant piping. The outdoor unit houses the compressor and the condenser – the key working parts of the air conditioner - while the indoor unit has a heat exchanger and fan to blow the heated (or cooled) air around the room. Most indoor units are wall mounted, although floor and ceiling mounted units may also be available. Room split systems are now one of the most common air conditioner types sold in Australia.

Less common window wall units consists of a single box that houses all parts of the air conditioner, installed in a window or through an external wall. Window wall units are generally less efficient than split systems.

Follow the steps below to enter the necessary information for a room reverse cycle air conditioner. The ratings of all air conditioners on the market are available on the [Australian Government's Energy Rating website](#). You can search this list by type of air conditioner, brand and model number.

Please note that if you have already specified a room refrigerative air conditioner as a cooler, you will specify the same system as the heater.

### Steps

1. Select 'Room' from the dropdown menu for 'System category'.
2. Select 'Room RAC – fixed capacity' or 'Room RAC – variable capacity'. Refer to the section [Fixed and variable capacity air conditioners](#) for further information.
3. Select 'Old rating' or 'New rating'. Refer to the section [Interpreting energy labels for air conditioners](#) for further information.
4. Specify the efficiency level of ducted reverse-cycle air conditioner using the slider. Both the Star rating and the HSPF (new rating) or ACOP (old rating) values change as the slider is adjusted. You can specify the efficiency by star rating or HSPF/ACOP. If you select 'New rating' the rating climate zone (i.e., cold, average/mixed or hot) is displayed underneath the slider to assist you with identifying the correct zoned energy rating (ZER) for the heater. Refer to the section [Interpreting energy labels for air conditioners](#) for further information.
5. Enter the rated capacity for the heater in kW. This is an optional field and will appear in the PDF summary generated by the tool. This value will not appear in the NatHERS Certificate.
6. Select the zones that are serviced by the heater.

## Heater 1

[Hide details](#) ^

6kW - Room RAC - fixed capacity

### System category

A room heater services a single room or an open plan area. A central heating system services large areas of a home.

Room 1

### Heater type

Room RAC - fixed capacity 2

### Efficiency rating

Old rating 3  
 New rating

3.50 HSPF 2 stars  
4  
☆☆☆☆☆☆☆☆  
Use the slider to enter the efficiency rating of your heating.

Use the rating for the Cold climate zone.

### Capacity

Max. hourly heating demand is 6.2kW

6 kW 5

### Select zones serviced by this heater

All rooms 6  
 KITCHEN/MEALS  
 WIR 5  
 BED 5



## Specifying heaters: Gas room heating

Room gas heaters are designed to heat a single room or open plan area by burning natural gas or liquid petroleum gas (LPG). Convection heaters just heat the air and blow it into the room, while radiant-convection heaters use a combination of radiated heat and heated air. Gas room heaters can be flued or unflued (also called flueless). Flued gas heaters are permanently installed, while unflued gas heaters may be fixed or portable (plug into bayonet fittings).

Follow the steps below to enter the necessary information for a gas room heating. The star rating of gas room heaters can be found in product specification documents or in the [Australian Gas Association product directory](#).

### Steps

1. Select 'Room' from the dropdown menu for 'System category'.
2. Select 'Gas room heating' from the dropdown menu.
3. Select if the appliance uses natural gas or LPG.
4. Specify the efficiency level in stars using the slider.
5. Enter the rated capacity for the heater in kW. This is an optional field and will appear in the PDF summary generated by the tool. This value will not appear in the NatHERS Certificate.
6. Select the zones that are serviced by the heater.

# Heater 1

6kW - Gas room heating

[Hide details](#) ^

## System category

A room heater services a single room or an open plan area. A central heating system services large areas of a home.

Room 1

## Heater type

Gas room heating 2

## What type of gas?

Natural gas 3

## Efficiency

Use the slider to enter the efficiency rating of your heating.

2 stars 4

★ ★ ☆ ☆ ☆ ☆

Slider: 0 to 100%

## Capacity

Max. hourly heating demand is 6.2kW

6 kW 5

## Select zones serviced by this heater

<input type="checkbox"/> All rooms	<input type="checkbox"/> WIR 5 <span>6</span>
<input checked="" type="checkbox"/> KITCHEN/MEALS	<input type="checkbox"/> BED 5

## Specifying heaters: Electric resistance room heater (with or without fan)

Electric resistance room heating includes electric panel heaters, electric convection heaters or electric fan-convection heaters. All heaters use an electric element to generate heat to heat the room, either by convection (heated air) or a combination of convection and low temperature radiation from the surface of the heater. The heaters are normally controlled by thermostat and may or may not have a fan to circulate heated air.

Follow the steps below to enter the necessary information for a room electric resistance heater.

### Steps

1. Select 'Room' from the dropdown menu for 'System category'.
2. Select 'Electric resistance – without fan' or 'Electric resistance – with fan' from the dropdown menu.
3. The efficiency is set to 100% can cannot be varied.
4. Enter the rated capacity for the heater in kW. This is an optional field and will appear in the PDF summary generated by the tool. This value will not appear in the NatHERS Certificate.
5. Select the zones that are serviced by the heater.

# Heater 1

6kW - Electric resistance - without fan

[Hide details](#) ^

## System category

A room heater services a single room or an open plan area. A central heating system services large areas of a home.

Room 1

## Heater type

Electric resistance - without fan 2

## Efficiency

Default value  
100 % 3

## Capacity

Max. hourly heating demand is 6.2kW

6 kW 4

## Select zones serviced by this heater

All rooms

WIR 5 5

KITCHEN/MEALS

BED 5

## Specifying heaters: Slow combustion room heater (with or without fan)

Slow combustion wood heaters burn wood in an enclosed firebox in a way that allows the flow of combustion air to be regulated, meaning that they are much more efficient than an open wood fire. Room air is drawn around the firebox, either by natural convection or by a fan, and flows into the room to be heated. Wood is the main fuel used by the heater, although heaters with air circulation fans will also use some electricity.

In Australia, slow combustion wood heaters are required to be tested and certified according to Australian Standard *AS/NZS4012 Domestic solid fuel burning appliances – method for determination of power output and efficiency and tested using Hardwood fuel*. This standard is used to measure the rated heat output of the heaters in kilowatts (kW) and their efficiency as a percentage. To be legally sold they must achieve a minimum efficiency of 60% and meet certain particulate (smoke) emission requirements.

Follow the steps below to enter the necessary information for a slow combustion room heater.

### Steps

1. Select 'Room' from the dropdown menu for 'System category'.
2. Select 'Slow combustion – without fan' or 'Slow combustion – with fan' from the dropdown menu.
3. The efficiency is certified to AS/NZS4012 and can be set between 60 percent to 90 percent using the slider.
4. Enter the rated capacity for the heater in kW. This is an optional field and will appear in the PDF summary generated by the tool. This value will not appear in the NatHERS Certificate.
5. Select the zones that are serviced by the heater.

# Heater 1

[Hide details](#) ^

6kW - Slow combustion - without fan

## System category

A room heater services a single room or an open plan area. A central heating system services large areas of a home.

Room 1

## Heater type

Slow combustion - without fan 2

## Efficiency

Use the slider to enter the efficiency rating of your heating.

60 % 3  
Efficiency certified to AS/NZS4012. Set to 60% if unknown

## Capacity

Max. hourly heating demand is 6.2kW

6 kW 4

## Select zones serviced by this heater

- All rooms
- KITCHEN/MEALS
- WIR 5 5
- BED 5

## Coolers

### Type of coolers available

FirstRate5 Whole of Home includes a range of common central and room cooling options. Central cooling systems can cool a whole house or large areas of a house, while a room cooler can cool a single room or open plan area. In some cases, a house might use a central cooling system for the main living areas, and a room cooler for other areas of the home. The available cooler options are shown in the table below, along with the way in which the efficiency level is specified.

Cooler Type	Central / Room	Efficiency Level	Main Fuel
Ducted refrigerative (fixed or variable capacity)	Central	Star rating – old or new ACOP or HSPF	Electricity
Multi-split refrigerative (fixed or variable capacity)	Central	Star rating – old or new ACOP or HSPF	Electricity
Ducted evaporative	Central	Fixed value (%)	Electricity
Room refrigerative (fixed or variable capacity)	Room	Star rating – old or new ACOP or HSPF	Electricity
Room evaporative	Room	Fixed value (%)	Electricity

# Adding coolers and selecting zones

When you start a new assessment, you will need to first click the 'Add cooler' button located under the Cooling banner to get started. You can add as many coolers as necessary to an assessment.

For each cooler added you will need to specify the system category, the heater type, the required efficiency information, and the zones that are serviced by the heater. The zones will automatically be copied across from the linked FirstRate5 project. The 'Duplicate heater' button will copy the selected heater.

Cooler 1 Hide details ^

**System category** After you select the cooler type, the required efficiency information will be displayed.

A room cooler services a single room or an open plan area. A central cooling system services large areas of a home

Central

**Cooler type**



Select option

Select zones serviced by this cooler

All rooms  Kitchen/Living 1

Bedroom 2

All zones available will be displayed here. If zones are already allocated to another cooler, they will not be selectable.

 Duplicate cooler  Delete cooler



Click this button to add additional coolers.



## Use of default coolers

Any unallocated zones will be allocated to the default cooler when the whole of home rating is calculated. Refer to the latest [NatHERS Technical Note](#) for further information about the default cooler used for the different NatHERS climate zones.

In the design documentation, if coolers have not been specified for the entire house or specific zones, do not specify any coolers. FirstRate5 Whole of Home will automatically assign the correct default cooler for the NatHERS climate zone the assessment is located in, and the cooler will be correctly listed as a default cooler on the NatHERS certificate.

## How to gather cooler efficiency information

When you specify a refrigerative cooler, you will need to gather the required cooler efficiency information to enter into FirstRate5 Whole of Home.

The recommended approach is to obtain the necessary efficiency information directly from the builder, building designer or product supplier you are working with. In many cases they should be able to supply with product brochures and specification documents that will simplify the process.

Where this is not possible, you will need to search product databases for the necessary efficiency information using heater model numbers. This approach can be more difficult because sometimes manufactures do not use consistent model numbers and you may not be able to find an exact match in the online product database. Also, the data contained in online databases can be complex and you will need ensure you are properly trained to interpret the information you gather.

## Interpreting energy labels for air conditioners

Reverse-cycle and refrigerative air conditioners (ducted, multi-split and room) are tested and rated for their energy efficiency to allow you to compare the performance of different models, and FirstRate5 Whole of Home requires you to select the energy efficiency level if you specify this type of heating. There are currently two rating schemes operating for air conditioners, and you will need to select the appropriate one in the “Efficiency Type” section of the cooler specification. For more information on air conditioner energy efficiency ratings visit the [Energy Rating website](#).

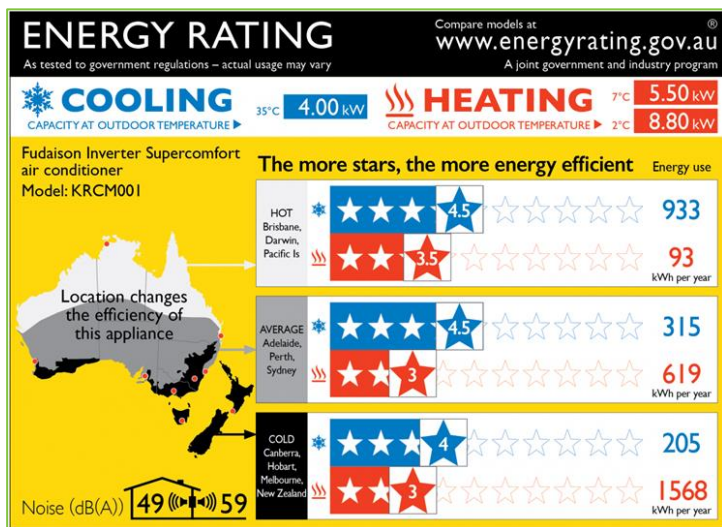
### New Rating

From April 2020, all new air conditioner models are required to have a Zoned Energy Rating (ZER), and these can differ by climate zone. Australia has been split into cold, average, and hot climate zones. The ZER provides a rating from 1 to 10 Stars; the higher the rating the more efficient the air conditioner is. The ratings of all air conditioners on the market are available on the [Australian Government’s Energy Rating website](#). You can search this list by type of air conditioner, brand and model number.

Where the air conditioners have a ZER, the cooling ratings are shown as the “SEER Heating Star Rating”, with ratings provided for the cold, average (or mixed) and hot climate zones. The ZERs are based on the Total Cooling Seasonal Performance Factor (TCSPF) of the air conditioner measured in a laboratory test. The TCSPF is the ratio of the total cooling output divided by the total electricity consumption of the air conditioner over a typical cooling

season. The TCSPF value would normally be provided in the supplier's model specification, either on-line or in the product brochure. It is also available in lists of registered products that can be downloaded as a CSV file for the from the [Australian Government's Energy Rating website](http://www.energyrating.gov.au) (scroll to the bottom of the page to find the 'Download CSV' button).

In FirstRate5 Whole of Home you specify the efficiency of air conditioners that use the new rating scheme by selecting the appropriate TCSPF or star rating.

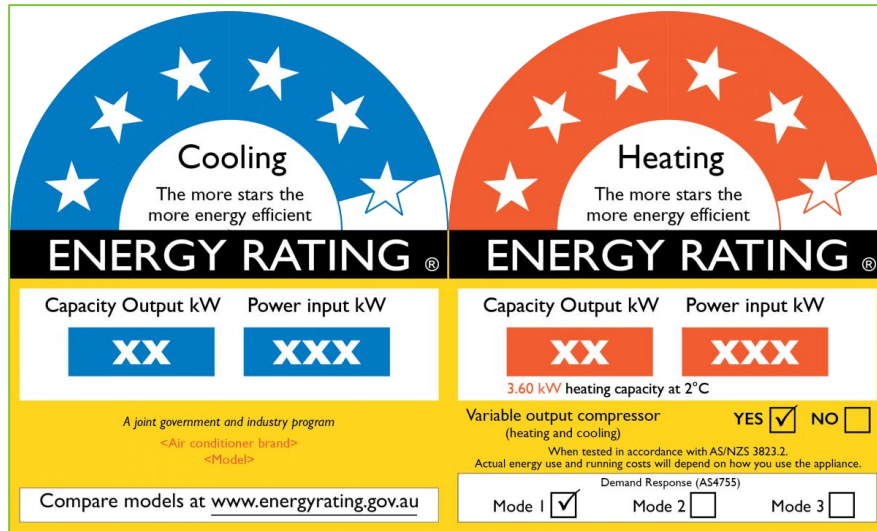


### Old Rating

The old rating scheme applies to air conditioner models that came onto the market *before* April 2020. In this case, the air conditioners had their efficiency measured for only one climate zone and, rather than a seasonal energy efficiency rating used for the new rating, it was based on their rated operating point. The provision of an energy rating for ducted systems was voluntary, and most ducted systems did not have one. The old rating scheme provides a rating from 1 to 10 Stars; the higher the rating the more efficient the air conditioner is. The ratings of all air conditioners on the market are available on the [Australian Government's Energy Rating website](http://www.energyrating.gov.au). You can search this list by type of air conditioner, brand and model number. Note that some air conditioners with these old ratings are expected to remain in the market until around 2024.

The old rating scheme was based on the Annual Coefficient of Performance (ACOP). The ACOP is the ratio of the heat output to the electrical power input when the air conditioner is operating at rated capacity. The ACOP value would normally be provided in the supplier's model specification, either on-line or in the product brochure. It is also available in lists of registered products that can be downloaded as a CSV file for the from the [Australian Government's Energy Rating website](http://www.energyrating.gov.au) (scroll to the bottom of the page to find the 'Download CSV' button).

In FirstRate5 Whole of Home you specify the efficiency of air conditioners that use the old rating scheme by selecting the appropriate ACOP or star rating.



## Fixed and variable capacity air conditioners

In FirstRate5 Whole of Home, when you select a reverse-cycle or refrigerative air conditioners (ducted, multi-split and room) you will need to specify if it is fixed capacity or variable capacity.

A variable capacity air conditioner has a variable speed drive, which enables the compressor to run at a range of speeds from slow to fast, to match the output required. This feature improves the energy efficiency performance of the unit. A fixed capacity air conditioner runs at a constant speed and varies its capacity by switching on and off at different intervals. This type of air conditioner is less energy efficient than a variable capacity unit.

You will be able to find out if an air conditioner is fixed capacity or variable capacity by referring to cooler specification documents or by finding model information on the [Energy Rating product database](#).

## Specifying coolers: Ducted refrigerative air conditioner (fixed or variable)

Ducted refrigerative air conditioners use a heat-pump (or refrigeration) cycle to extract heat from the air inside a home to cool the air down and expel the heat to the outside air. They can cool a whole home or large areas of a home. A compressor unit is located outside the house, and this is connected via refrigerant piping to an indoor fan-coil unit located in the roof space which contains a heat exchanger and an air distribution fan. The cooled air is distributed to ceiling outlets in different rooms via insulated ductwork and is drawn back in through a return-air grille and brought back to the indoor fan-coil unit to be re-cooled when it passes over the heat exchanger.

Ducted reverse-cycle air conditioners can provide both refrigerative cooling and heating in the one system, and cooling-only ducted refrigerative models are also available. Gas ducted heating systems can have a cooling coil inserted in their ductwork, so that they can provide ducted gas heating in winter, and ducted refrigerative cooling in summer.

Follow the steps below to enter the necessary information for a ducted refrigerative cycle air conditioner. The ratings of all air conditioners on the market are available on the [Australian Government's Energy Rating website](#). You can search this list by type of air conditioner, brand and model number.

Please note that if you have already specified a reverse-cycle air conditioner as a heater, you will specify the same system as the cooler.

### Steps

1. Select 'Central' from the dropdown menu for 'System category'.
2. Select 'Ducted refrigerative – fixed capacity' or 'Ducted refrigerative – variable capacity'. Refer to the section [Fixed and variable capacity air conditioners](#) for further information.
3. In most cases you will leave the age of ductwork set as 'Less than 10 years'. You should only change this value if you are assessing an existing house and you do not intend to generate a NatHERS Certificate.
4. Select 'Old rating' or 'New rating'. Refer to the section [Interpreting energy labels for air conditioners](#) for further information.
5. Specify the efficiency level of the ducted refrigerative air conditioner using the slider. Both the Star rating and the TCSPF (new rating) or ACOP (old rating) values change as the slider is adjusted. You can specify the efficiency by star rating or TCSPF/ACOP. If you select 'New rating' the rating climate zone (i.e., cold, average/mixed or hot) is displayed underneath the slider to assist you with identifying the correct zoned energy rating (ZER) for the cooler. Refer to the section [Interpreting energy labels for air conditioners](#) for further information.
6. Enter the rated capacity for the cooler in kW. This is an optional field and will appear in the PDF summary generated by the tool. This value will not appear in the NatHERS Certificate.
7. Select the zones that are serviced by the cooler.

## Cooler 1

[Hide details](#) ^

1kW - Ducted refrigerative - fixed capacity

### System category

A room cooler services a single room or an open plan area. A central cooling system services large areas of a home

Central

### Cooler type

Ducted refrigerative - fixed capacity

### Age of ductwork

Less than 10 years

### Efficiency rating

Old rating

New rating

2.50 TCSPF

1 stars

### Efficiency

Use the slider to enter the efficiency rating of your cooler.



Use the rating for the Cold climate zone.

### Capacity

Max. hourly cooling demand is 0.0kW

1

kW

### Select zones serviced by this cooler

All rooms

WIR 5

KITCHEN/MEALS

BED 5

## Specifying coolers: Multi-split refrigerative air conditioner (fixed or variable)

Multi-split refrigerative air conditioners cool multiple rooms using only one outdoor unit connected to multiple indoor units. Each indoor unit can also be individually controlled, scheduled and set to the desired room temperature.

Multi-split systems are composed of multiple indoor units and a single outdoor unit, connected by refrigerant piping. The outdoor unit houses the compressor and the condenser – the key working parts of the air conditioner - while the indoor units have a heat exchanger and fan to blow the cooled air around the room. Most indoor units are wall mounted, although floor and ceiling mounted units may also be available.

Follow the steps below to enter the necessary information for a multi-split refrigerative air conditioner. The ratings of all air conditioners on the market are available on the [Australian Government's Energy Rating website](#). You can search this list by type of air conditioner, brand and model number.

Please note that if you have already specified a multi-split reverse-cycle air conditioner as a heater, you will specify the same system as the cooler.

### Steps

1. Select 'Central' from the dropdown menu for 'System category'.
2. Select 'Multi-split refrigerative – fixed capacity' or 'Multi-split refrigerative – variable capacity'. Refer to the section [Fixed and variable capacity air conditioners](#) for further information.
3. Select 'Old rating' or 'New rating'. Refer to the section [Interpreting energy labels for air conditioners](#) for further information.
4. Specify the efficiency level of the multi-split refrigerative air conditioner using the slider. Both the Star rating and the TCSPF (new rating) or ACOP (old rating) values change as the slider is adjusted. You can specify the efficiency by star rating or TCSPF/ACOP. If you select 'New rating' the rating climate zone (i.e., cold, average/mixed or hot) is displayed underneath the slider to assist you with identifying the correct zoned energy rating (ZER) for the cooler. Refer to the section [Interpreting energy labels for air conditioners](#) for further information.
5. Enter the rated capacity for the cooler in kW. This is an optional field and will appear in the PDF summary generated by the tool. This value will not appear in the NatHERS Certificate.
6. Select the zones that are serviced by the cooler.

## Cooler 1

1kW - Multisplit refrigerative - Variable capacity

[Hide details](#) ^

### System category

A room cooler services a single room or an open plan area. A central cooling system services large areas of a home

Central 1

### Cooler type

Multisplit refrigerative - Variable cap. 2

### Efficiency rating

- Old rating 3  
 New rating

2.50 TCSPF 1 stars

### Efficiency

Use the slider to enter the efficiency rating of your cooler.

4

★ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆

—○—

Use the rating for the Cold climate zone.

### Capacity

Max. hourly cooling demand is 0.0kW

1 kW 5

### Select zones serviced by this cooler

- All rooms 6
- WIR 5
- KITCHEN/MEALS
- BED 5

## Specifying coolers: Ducted evaporative cooler

Ducted evaporative coolers have a cooling unit located on the roof of the house and use ductwork to distribute the cooled air to different rooms in a house. The air is blown into the house at a fairly high rate, and windows and/or doors must be opened to allow the cooled air to flow through the house and back outside. The cooling effect is provided partly by the cooled air and partly by the air flow creating a cooling breeze. The cooling unit has a water tank and a pump which circulates the water through cooling pads located on the side of the cooling unit. The outside air is cooled and humidified as it is drawn through the cooling pads by a large fan, which then blows the air through the ductwork and into the home.

Ducted evaporative coolers tend to consume less electricity than a ducted refrigerative air conditioner cooling the same floor area of a house, although they also consume water – the amount of water they use depends on the water quality management system used and on the local climate. FirstRate5 Whole of Home only takes the electricity consumption into account when calculating the running costs and greenhouse gas emissions that result from the use of ducted evaporative cooling. It does not include the cost of any water that might be used.

Ducted evaporative coolers are best suited to dryer climates and are less effective on humid days. You can download a MS Excel spreadsheet from the [NatHERS website](#) which lists the suitability of evaporative cooling for all NatHERS climate zones (refer to Appendix A). Climate zones are specified as 'Not suitable', 'Marginal' or 'Suitable'.

Follow the steps below to enter the necessary information for a ducted evaporative cooler.

### Steps

1. Select 'Central' from the dropdown menu for 'System category'.
2. Select 'Ducted evaporative' from the dropdown menu.
3. In most cases you will leave the age of ductwork set as 'Less than 10 years'. You should only change this value if you are assessing an existing house and you do not intend to generate a NatHERS Certificate.
4. The efficiency is fixed at 1500% and cannot be changed.
5. Enter the rated capacity for the cooler in kW. This is an optional field and will appear in the PDF summary generated by the tool. This value will not appear in the NatHERS Certificate.
6. Select the zones that are serviced by the cooler.



## Cooler 1

1kW - Ducted evaporative

[Hide details](#) ^

### System category

A room cooler services a single room or an open plan area. A central cooling system services large areas of a home

Central

1

### Cooler type

Ducted evaporative

2

### Age of ductwork

Less than 10 years

3

### Efficiency

Default value

1500 %

4

### Capacity

Max. hourly cooling demand is 0.0kW

1 kW

5

### Select zones serviced by this cooler

All rooms

WIR 5

6

KITCHEN/MEALS

BED 5

## Specifying coolers: Room refrigerative air conditioner (fixed or variable)

Room refrigerative air conditioners can cool a single room or open plan area and come as split systems or window/wall units. Cooling only refrigerative air conditioners are available, but most come as reverse-cycle air conditioners that can both cool and heat.

Split systems are composed of an indoor unit and an outdoor unit, connected by refrigerant piping. The outdoor unit houses the compressor and the condenser – the key working parts of the air conditioner - while the indoor unit has a heat exchanger and fan to blow the cooled air around the room. Most indoor units are wall mounted, although floor and ceiling mounted units may also be available. Room split systems are now one of the most common air conditioner types sold in Australia. Less common window/wall units consist of a single box that houses all parts of the air conditioner, installed in a window or through an external wall. Window/wall units are generally less efficient than split systems.

Follow the steps below to enter the necessary information for a room refrigerative air conditioner. The ratings of all air conditioners on the market are available on the [Australian Government's Energy Rating website](#). You can search this list by type of air conditioner, brand and model number.

Please note that if you have already specified a room reverse-cycle air conditioner as a heater, you will specify the same system as the cooler.

### Steps

1. Select 'Room' from the dropdown menu for 'System category'.
2. Select 'Room refrigerative – fixed capacity' or 'Room refrigerative – variable capacity'. Refer to the section [Fixed and variable capacity air conditioners](#) for further information.
3. Select 'Old rating' or 'New rating'. Refer to the section [Interpreting energy labels for air conditioners](#) for further information.
4. Specify the efficiency level of the room refrigerative air conditioner using the slider. Both the Star rating and the TCSPF (new rating) or ACOP (old rating) values change as the slider is adjusted. You can specify the efficiency by star rating or TCSPF/ACOP. If you select 'New rating' the rating climate zone (i.e., cold, average/mixed or hot) is displayed underneath the slider to assist you with identifying the correct zoned energy rating (ZER) for the cooler. Refer to the section [Interpreting energy labels for air conditioners](#) for further information.
5. Enter the rated capacity for the cooler in kW. This is an optional field and will appear in the PDF summary generated by the tool. This value will not appear in the NatHERS Certificate.
6. Select the zones that are serviced by the cooler.

### Cooler 1

1kW - Room refrigerative - variable capacity [Hide details](#) ^

---

**System category**  
A room cooler services a single room or an open plan area. A central cooling system services large areas of a home

Room

**Cooler type**  
Room refrigerative - variable capacity

**Efficiency rating**  
 Old rating  
 New rating

3.50 TCSPF 2 stars

**Efficiency**  
Use the slider to enter the efficiency rating of your cooler.

★ ★ ☆ ☆ ☆ ☆ ☆ ☆ ☆ ☆

Use the rating for the Cold climate zone.

**Capacity**  
Max. hourly cooling demand is 0.0kW

1 kW

---

Select zones serviced by this cooler

<input type="checkbox"/> All rooms	<input type="checkbox"/> WIR 5
<input type="checkbox"/> KITCHEN/MEALS	<input type="checkbox"/> BED 5



## Specifying coolers: Room evaporative cooler

Room evaporative coolers consist of a single box that houses all parts of the cooler, installed in a window or through an external wall. They are used to cool a single room or open plan area.

The air is blown into the house and windows and/or doors must be opened to allow the cooled air to flow through the house and back outside. The cooling effect is provided partly by the cooled air and partly by the air flow creating a cooling breeze. The cooling unit is plumbed circulates water through cooling pads located inside the cooling unit. The outside air is cooled and humidified as it is drawn through the cooling pads by the fan, which then blows the air through into the home.

Room evaporative coolers tend to consume less electricity than a ducted refrigerative air conditioner cooling the same floor area of a house, although they also consume water – the amount of water they use depends on the water quality management system used and on the local climate. FirstRate5 Whole of Home only takes the electricity consumption into account when calculating the running costs and greenhouse gas emissions that result from the use of ducted evaporative cooling. It does not include the cost of any water that might be used.

Room evaporative coolers are best suited to dryer climates and are less effective on humid days. You can download a MS Excel spreadsheet from the [NatHERS website](#) which lists the suitability of evaporative cooling for all NatHERS climate zones (refer to Appendix A). Climate zones are specified as 'Not suitable', 'Marginal' or 'Suitable'.

Follow the steps below to enter the necessary information for a ducted evaporative cooler.

### Steps

1. Select 'Room' from the dropdown menu for 'System category'.
2. Select 'Room evaporative' from the dropdown menu.
3. The efficiency is fixed at 1500% and cannot be changed.
4. Enter the rated capacity for the cooler in kW. This is an optional field and will appear in the PDF summary generated by the tool. This value will not appear in the NatHERS Certificate.
5. Select the zones that are serviced by the cooler.

## Cooler 1

1kW - Room evaporative

[Hide details](#) ^

### System category

A room cooler services a single room or an open plan area. A central cooling system services large areas of a home

Room 1

### Cooler type

Room evaporative 2

### Efficiency

Default value  
1500 % 3

### Capacity

Max. hourly cooling demand is 0.0kW

1 kW 4

### Select zones serviced by this cooler

All rooms

WIR 5 5

KITCHEN/MEALS

BED 5

## Water heating

### Types of water heaters available

FirstRate5 Whole of Home includes a range of common water heating options, including solid fuel, electric storage, electric instantaneous, heat pump, solar water systems with either an electric or gas boost, gas storage and gas instantaneous systems. The electric storage, heat pump and solar electric water heaters can be specified as either continuous or off peak. If you select the continuous option, this means the water heater runs on the normal peak (or general) electricity tariff. If you select the off-peak option, this means the water heater runs on the cheaper off-peak electricity tariff. If operated on the peak tariff, they will tend to use electricity when hot water is used. If operated on the off-peak electricity tariff, they will mainly use electricity during the off-peak period – typically 11 pm to 7 am – although some off-peak tariffs may allow an afternoon boost.

The water heating options, the way in which the efficiency level is specified, and the main fuel used by the water heaters are shown in the table below.

Type	Efficiency Level	Main Fuel
Electric storage (continuous)	fixed	Electricity
Electric storage – (off-peak)	fixed	Electricity
Electric instantaneous	Fixed	Electricity
Heat pump – (continuous)	Small-scale tradable certificates (STCs)	Electricity
Heat pump – (off-peak)	Small-scale tradable certificates (STCs)	Electricity
Solar electric – (continuous)	Small-scale tradable certificates (STCs)	Electricity
Solar electric – (off-peak)	Small-scale tradable certificates (STCs)	Electricity
Gas storage	4 to 5.5 stars	Natural gas or LPG
Gas instantaneous	4 to 7.0 stars	Natural gas or LPG
Solar boosted gas	Small-scale tradable certificates (STCs)	Natural gas or LPG
Solid fuel	Fixed	Wood

## Use of STCs for solar and heat pump water heater efficiency

There is no official energy rating scheme for solar electric, solar gas and heat pump water heaters. However, these type of water heaters can be eligible to generate Small-scale Technology Certificates (STCs) under Australia's Renewable Energy Target, and these certificates make them eligible to receive a financial incentive under this scheme. Visit the [Clean Energy Regulator's website](#) for more information.

The number of STCs that can be created for any system is based on its geographical location, installation date, and the amount of electricity in megawatt hours (MWh) that it can save over a 10-year period.

In terms of geographical location, Australia is split up into five different water heating climate zones. Zones 1-4 are relevant to solar electric, solar gas and heat pump water heaters. Zone 5 is a special zone for heat pump water heaters and covers the coldest locations in Australia. For any given water heating climate zone, the number of STCs that a particular heat pump water heater model is eligible for is a guide to how energy efficient it is. The higher the number of STCs, the more efficient.

A list of eligible heat pump water heaters, and the number of STCs they are eligible for in each water heating climate zone is available from the [Clean Energy Regulator's website](#) (download the relevant file listed underneath the 'Register of solar water heaters' heading). You must only use values from this data source when entering STC values into FirstRate5 Whole of Home. Assessors should **not** use STC from the Clean Energy Regulator online calculator because this value is not the full 10-year STC value.

## Specifying water heaters: Solar electric water heater (continuous or off peak)

A solar electric hot water system uses the sun's energy to heat water as the water passes through solar collectors located on the roof. It has an electric element in the storage cylinder, and when there isn't enough sunshine to fully heat the water, this booster element will kick in as a back-up. It's usually possible to run these on the cheaper off-peak electricity tariff, but they can also be run on the peak (or general) electricity tariff.

The solar collectors (or panels) of the solar water heater need to be installed on a section of north-facing roof, ideally no more than 45° east or west of true north. They should be sloping at an angle of between 15° and 50°, and a standard roof pitch will normally be sufficient. Other roof orientations may also be suitable, provided the unit is mounted on a frame to face north.

The water heating section of the tool allows you to select either a **Solar electric (continuous)** or **Solar electric (off peak)** water heater. The continuous option is assumed to operate on the peak (or general) electricity tariff, and to use electricity anytime during the day when hot water is used. The off-peak option is assumed to operate on the off-peak electricity tariff overnight.

Follow the steps outlined below to enter the required information for a solar electric water heater.

### Steps

1. Take note of the solar water heater zone the assessed dwelling is located in.
2. Select 'Solar electric (continuous)' or 'Solar electric (off peak)' from the dropdown menu.
3. Enter the 10-year STC value in Zone 3 for the water heater model you are specifying. You must enter this value even if the assessed dwelling is not located in Zone 3 because this value is used when populating the NatHERS Certificate. Refer to section [Use of STCs for solar and heat pump water heater efficiency](#) for further information about finding STC values for water heater models.
4. Refer to the solar water heater zone the assessed dwelling is located in (see Step 1 or text underneath the slider) and use the slider to select the number of STCs the water heater is eligible for in that zone. Refer to section [Use of STCs for solar and heat pump water heater efficiency](#) for further information about finding STC values for water heater models.
5. The 'Size' field refers to the daily water heating load that was used by the manufacturer when calculating the number of STCs a specific water heater is eligible for. Select the appropriate water heater size (i.e., small, medium or large) from the dropdown menu to expose the STC range required for the water heater you are specifying.



## Water Heating

Water heating zone

SWH Zone 4 **1**

Water heater

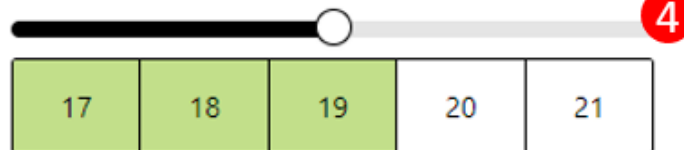
Solar electric (continuous) **2**

10 year STC in Zone 3

24 **3**

Efficiency

19 STC



10 Year STC in Zone 4

Size

Small **5**

## Specifying water heaters: Heat pump water heater (continuous or off peak)

Heat pump water heaters use a refrigeration (or heat pump) cycle to extract heat from the surrounding air. They then use a heat exchanger to heat water in an insulated storage cylinder. This system works in a similar way to reverse-cycle air conditioners when run on a heating cycle, but heat water instead of the air inside your home. A heat pump hot water system can be thought of as a type of solar water heater, because the heat in the air ultimately comes from the sun. Unlike solar hot water systems, heat-pump systems don't have an electric or gas boost system. But they do use electricity to operate the evaporator fan and compressor when they're heating water.

The water heating section of the tool allows you to select either a Heat pump (continuous) or Heat pump (off peak) water heater. The continuous option is assumed to operate on the peak (or general) electricity tariff, and to use electricity anytime during the day when hot water is used. The off-peak option is assumed to operate on the off-peak electricity tariff overnight.

Follow the steps outlined below to enter the required information for a heat pump water heater.

### Steps

1. Take note of the heat pump water heater zone the assessed dwelling is located in.
2. Select 'Heat pump (continuous)' or 'Heat pump (off peak)' from the dropdown menu.
3. Enter the 10-year STC value in Zone 3 for the water heater model you are specifying. You must enter this value even if the assessed dwelling is not located in Zone 3 because this value is used when populating the NatHERS Certificate. Refer to section [Use of STCs for solar and heat pump water heater efficiency](#) for further information about finding STC values for water heater models.
4. Refer to the heat pump water heater zone the assessed dwelling is located in (see Step 1 or text underneath the slider) and use the slider to select the number of STCs the water heater is eligible for in that zone. Refer to section [Use of STCs for solar and heat pump water heater efficiency](#) for further information about finding STC values for water heater models.
5. The 'Size' field refers to the daily water heating load that was used by the manufacturer when calculating the number of STCs a specific water heater is eligible for. Select the appropriate water heater size (i.e., small or medium) from the dropdown menu to expose the STC range required for the water heater you are specifying. Please note that for heat pump water heaters there are no STC values for the large size selection. If this 'Large' is selected the value zero will be displayed and value will not be able to be entered.

## Water Heating

Water heating zone

HP Zone 4 **1**

Water heater

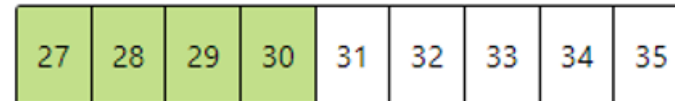
Heat pump (continuous) **2**

10 year STC in Zone 3

24 **3**

Efficiency

30 STC **4**



10 Year STC in Zone 4

Size

Medium **5**

## Specifying water heaters: Solar boosted gas water heater

A solar boosted gas hot water system uses the sun's energy to heat water as it passes through solar collectors located on the roof and store it in an insulated cylinder which is usually located above the solar collectors. When there isn't enough sunshine to fully heat the water, a gas booster will kick in as a back-up. The gas booster would normally use natural gas, but systems that use LPG are also available. The gas booster can be inside the storage cylinder, but it's now more common to use a gas instantaneous water heater located on an outside wall to provide any necessary boosting when the hot water is being used. Some systems have a separate gas storage water heater on the ground connected to the storage cylinder, and this uses a gas burner to top up the heat in the water heater, if required.

The solar collectors (or panels) of the solar water heater need to be installed on a section of north-facing roof, ideally no more than 45° east or west of true north. They should be sloping at an angle of between 15° and 50°, and a standard roof pitch will normally be sufficient. Other roof orientations may also be suitable, provided the unit is mounted on a frame to face north.

Follow the steps outlined below to enter the required information for a solar boosted gas water heater.

### Steps

1. Take note of the solar water heater zone the assessed dwelling is located in.
2. Select 'Solar boosted gas' from the dropdown menu.
3. Select if the appliance uses natural gas or LPG.
4. Enter the 10-year STC value in Zone 3 for the water heater model you are specifying. You must enter this value even if the assessed dwelling is not located in Zone 3 because this value is used when populating the NatHERS Certificate. Refer to section [Use of STCs for solar and heat pump water heater efficiency](#) for further information about finding STC values for water heater models.
5. Refer to the solar water heater zone the assessed dwelling is located in (see Step 1 or text underneath the slider) and use the slider to select the number of STCs the water heater is eligible for in that zone. Refer to section [Use of STCs for solar and heat pump water heater efficiency](#) for further information about finding STC values for water heater models.
6. The 'Size' field refers to the daily water heating load that was used by the manufacturer when calculating the number of STCs a specific water heater is eligible for. Select the appropriate water heater size (i.e., small, medium or large) from the dropdown menu to expose the STC range required for the water heater you are specifying.



## Water Heating

Water heating zone

SWH Zone 4 **1**

Water heater

Solar boosted gas **2**

What type of gas?

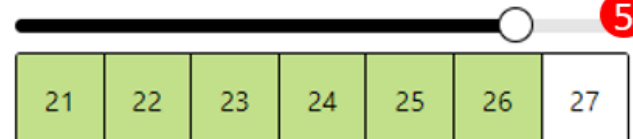
Natural gas **3**

10 year STC in Zone 3

24 **4**

Efficiency

26 STC



10 Year STC in Zone 4

Size

Medium **6**

## Specifying water heaters: Gas storage water heater

Gas storage water heaters use natural gas or LPG to heat water and then store it in an insulated cylinder, ready to use when required. Hot water is drawn off the top of the cylinder and cold water drawn in at the bottom. When you use hot water, the burner comes back on to heat the cold water up to temperature. All storage systems lose some heat through the walls of the cylinder. This means they use energy even if you don't use any hot water. The bigger the cylinder is, the more heat is lost. For small households, heat losses can add up to a high proportion of overall hot water energy use. In these cases, a gas instantaneous water heater will have lower gas use and be cheaper to run.

Follow the steps outlined below to enter the required information for a gas storage water heater. The star rating of gas storage water heaters can be found in product specification documents or in the [Australian Gas Association product directory](#).

### Steps

1. Select 'Gas storage' from the dropdown menu.
2. Select if the appliance uses natural gas or LPG.
3. Specify the efficiency level in stars using the slider.

**Water Heating**

Water heating zone: SWH Zone 4

Water heater: Gas storage

What type of gas?: Natural gas

Efficiency: 4 Stars

Use the slider to enter the efficiency rating of the water heater

\*Increments of 0.5 Stars, Minimum Stars: 4

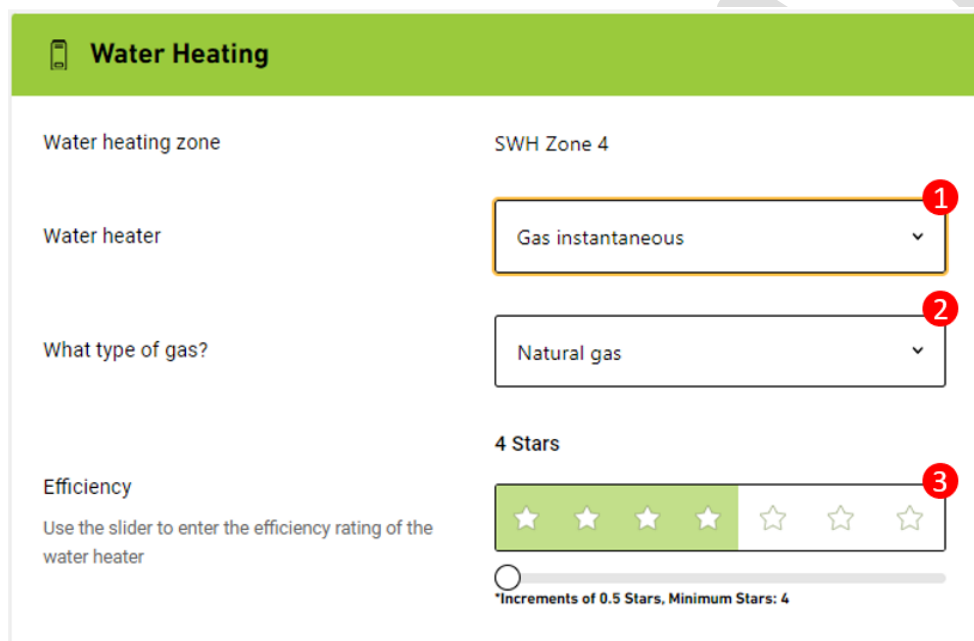
## Specifying water heaters: Gas instantaneous water heater

Gas instantaneous water heaters are normally located on an outside wall. They use a powerful gas burner to heat water when it is when needed. This generally reduces the amount of gas needed to heat the water compared to storage systems, as there are no heat losses through the storage cylinder walls. This is especially the case for smaller households.

Follow the steps outlined below to enter the required information for a gas instantaneous water heater. The star rating of gas instantaneous water heaters can be found in product specification documents or in the [Australian Gas Association product directory](#).

### Steps

1. Select 'Gas instantaneous' from the dropdown menu.
2. Select if the appliance uses natural gas or LPG.
3. Specify the efficiency level in stars using the slider.



The screenshot shows a mobile application interface for 'Water Heating'. The form is titled 'Water Heating' and has a green header. It contains the following fields:

- Water heating zone:** SWH Zone 4
- Water heater:** A dropdown menu with 'Gas instantaneous' selected. A red circle with the number '1' is next to it.
- What type of gas?:** A dropdown menu with 'Natural gas' selected. A red circle with the number '2' is next to it.
- Efficiency:** A star rating slider. The current rating is 4 stars. A red circle with the number '3' is next to it. Below the stars, it says 'Use the slider to enter the efficiency rating of the water heater' and '\*Increments of 0.5 Stars, Minimum Stars: 4'.

## Specifying water heaters: Electric storage water heater (continuous or off-peak)

Electric storage water heaters heat water with an electric element and store it in an insulated cylinder, ready for use throughout the day. Large systems (160 litres or more) are normally run on the cheaper off-peak electricity tariff. The electric element is powered overnight (typically from 11 pm to 7am) so that there is a full tank of hot water in the morning. Small systems (generally 125 litres or less) can only be run on the more expensive peak (or general) electricity tariff. When hot water is used, the electric element switches on under thermostat control and re-heats the cold water that is drawn into the system. They are often located inside in a cupboard and can be found in flats and apartments.

A small amount of heat is continually lost through the walls of the insulated storage cylinder – this is called the “standing losses”. These losses are higher for larger hot water systems. For small households, which have low hot water use, the standing losses can account for a significant amount of the annual electricity consumption.

Follow the steps outlined below to enter the required information for an electric storage water heater.

### Steps

1. Select ‘Electric storage (continuous)’ or ‘Electric storage (off peak)’ from the dropdown menu. For this option there are no further choices to make as a fixed efficiency is applied.

**Water Heating**

Water heating zone: SWH Zone 4

Water heater: Electric storage (continuous) 1



## Specifying water heaters: Electric instantaneous water heater

Electric instantaneous water heaters use a high-powered electric element to heat the water as it is used and are run on the peak (or general) electricity tariff. These systems don't have a cylinder to store water. They use less energy than storage electric water heaters to provide a certain amount of hot water as, unlike the storage systems, they do not have standing losses through the cylinder wall. This type of system is sometimes used in a flat or apartment.

Follow the steps outlined below to enter the required information for an electric storage water heater.

### Steps

1. Select 'Electric instantaneous' from the dropdown menu. For this option there are no further choices to make as a fixed efficiency is applied.

**Water Heating**

Water heating zone: SWH Zone 4

Water heater: Electric instantaneous

## Specifying water heaters: Solid fuel water heater

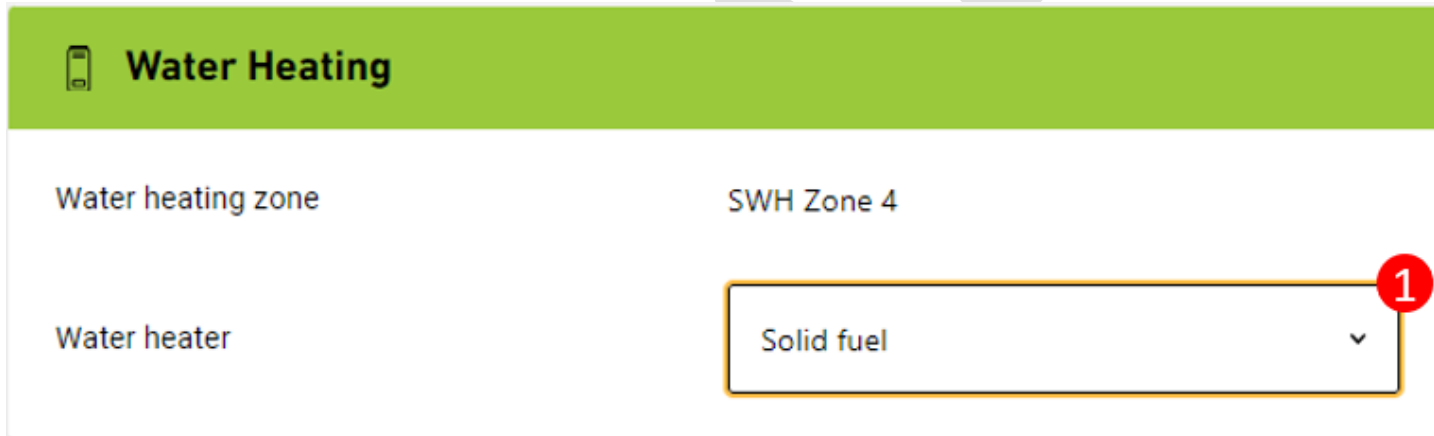
Solid fuel water heaters heat water by combusting wood and store it in an insulated cylinder, ready for use throughout the day. This type of water heater is more common in rural areas and off-grid properties.

A small amount of heat is continually lost through the walls of the insulated storage cylinder – this is called the “standing losses”. These losses are higher for larger hot water systems. For small households, which have low hot water use, the standing losses can account for a significant amount of the annual heat loss.

Follow the steps outlined below to enter the required information for a solid fuel water heater.

### Steps

1. Select ‘Solid fuel’ from the dropdown menu. For this option there are no further choices to make as a fixed efficiency is applied.



**Water Heating**

Water heating zone SWH Zone 4

Water heater Solid fuel

## Cooking equipment

### Types of cooking equipment available

The whole of house tool allows you to specify several common types of gas and electric cooktops and ovens. These are shown in the table below, along with the main fuel type that they use. Note that the Electric cooktop option covers all types of electric resistance cooktops, including ones with hot plates, heating coils or a halogen element.

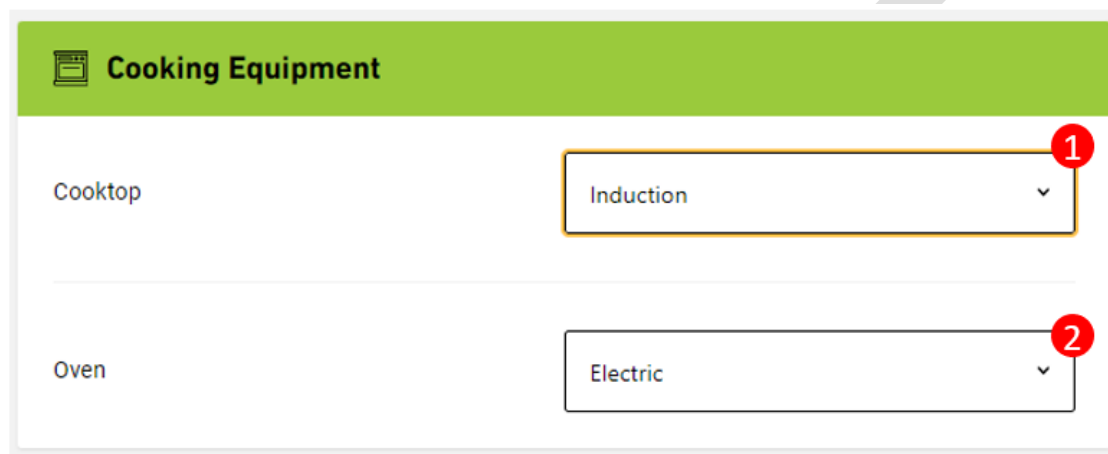
Type	Category	Efficiency Level	Main Fuel
Gas	Cooktop	fixed	Natural gas or LPG
Electric	Cooktop	fixed	Electricity
Induction	Cooktop	fixed	Electricity
Gas	Oven	fixed	Natural gas or LPG
Electric	Oven	fixed	Electricity

## Specifying cooking equipment

Follow the steps outline below to enter the information for cooking equipment.

### Steps

1. For Cooktop select 'Electric', 'Induction' or 'Gas' from the dropdown list. If you select 'Gas' you will need to specify if the cooktop uses natural gas or LPG. Note that the electric cooktop option covers all types of electric resistance cooktops, including ones with hot plates, heating coils or a halogen element.
2. For Oven select 'Electric' or 'Gas'. If you select 'Gas' you will need to specify if the cooktop uses natural gas or LPG.



The screenshot shows a form titled "Cooking Equipment" with a green header. Below the header, there are two dropdown menus. The first dropdown is labeled "Cooktop" and has "Induction" selected. A red circle with the number "1" is positioned to the right of this dropdown. The second dropdown is labeled "Oven" and has "Electric" selected. A red circle with the number "2" is positioned to the right of this dropdown. A large, faint watermark "DRAFT" is visible across the background of the form.

## Plug-in appliances and lighting

### Overview

In the “Plug-in appliances and Lighting” section of the tool, it is only possible to specify the efficiency of the overall lighting scheme. Plug-in appliances include the fridge and freezer, washing machine, clothes dryer, dishwasher, televisions, and a range of other equipment. This cannot be specified in the tool, but the expected annual electricity consumption of these plug-in appliances is estimated based on the assumed number of people in the house (linked to the total floor area), typical numbers of these appliances found in houses, the average capacity/size of these appliances, and the average energy efficiency of new appliances sold. The plug-in appliances make a significant contribution to household electricity consumption, energy bills, and greenhouse gas emissions. The electricity consumption of these appliances also has a significant impact on how the electricity produced by any rooftop PV system (with or without battery storage) interacts with the mains electricity consumption.

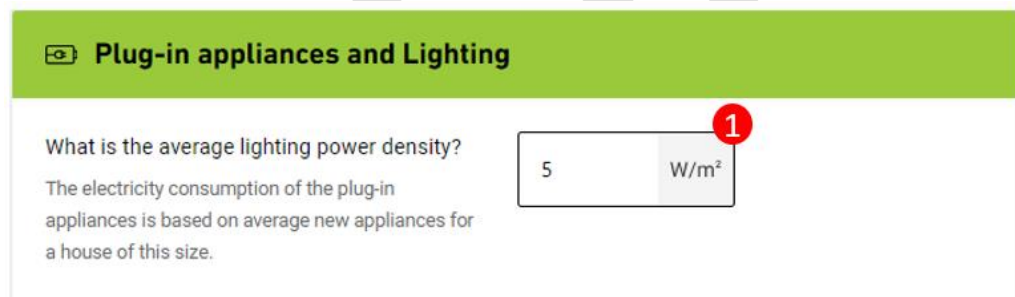
### Specifying lighting power density

The energy efficiency of the lighting used in the house design is specified by entering the lighting power density as Watts per square metre ( $W/m^2$ ). This is the total rated power consumption of all the lighting to be installed in the house divided by the floor area. The default value is  $5 W/m^2$ , estimated to be the typical lighting power density achieved in new houses constructed today. This value can be adjusted up or down, depending on the type and power consumption of the lighting that will be used. The [NatHERS Technical Note](#) states that that Assessors must enter the lighting power density ( $W/m^2$ ) in the design documentation. If this value is unknown, the default value of  $5 W/m^2$  must be used.

Follow the step outlined below to enter information for lighting.

#### Steps

1. Enter the lighting power density ( $W/m^2$ ) into the input field.



**Plug-in appliances and Lighting**

What is the average lighting power density?

The electricity consumption of the plug-in appliances is based on average new appliances for a house of this size.

5 W/m<sup>2</sup>

## Pool (and spa)

### Types of pool pumps available

All swimming pools will use a pump to circulate water through the pool filter, and these pumps can have quite a high annual electricity consumption. In FirstRate5 Whole of Home you need to specify the type of pump used – this can be either a conventional single speed pump (the least efficient option) or can be the more efficient dual- or multi-speed pump. The pool pump options are shown in the table below.

Star ratings of between 1 and 10 stars can be specified – single speed pumps are usually rated below 4 Stars, while the most efficient dual- and multi-speed pumps can be rated 7 to 10 Stars. The ratings of pool pumps on the market are available on the [Australian Government's Energy Rating website](#).

Refer to the latest [NatHERS Technical Note](#) for information about how to model spas.

Pump type	Efficiency Level	Main Fuel
Single-speed	Star rating	Electricity
Dual-speed	Star rating	Electricity
Multi- or variable-speed	Star rating	Electricity

## Specifying pool pumps and pool volume

The size of the swimming pool can be specified either by Volume (litres) or by Surface Area (m<sup>2</sup>). Use the buttons available to select how you want to enter the pool size. If you select the “Surface Area” option, then the tool will use this to estimate the volume of the pool in litres.

Follow the steps below to enter information for pools.

### Steps

1. If the assessed dwelling has a pool, select ‘Yes’.
2. Select how you will specify the pool size. If you select ‘Volume’, you will enter the size of the pool in litres. If you select ‘Surface Area’, you will enter the pool surface area and the average pool depth.
3. Select the pump type from the dropdown list.
4. Select if the efficiency of the pool pump is known. If the efficiency is unknown, a default efficiency will be used.
5. Specify the efficiency level in stars using the slider.

The screenshot shows a form titled "Pool" with the following fields and options:

- Is there a pool?**: Radio buttons for "Yes" (selected, marked with a red 1) and "No".
- How is the pool size specified?**: Two buttons, "Surface Area" and "Volume" (selected, marked with a red 2).
- Pool Volume**: A range input field showing "0" and "L".
- Pump Type**: A dropdown menu showing "Single-speed" (marked with a red 3).
- Is the pump efficiency known?**: Two buttons, "Yes" (selected, marked with a red 4) and "No".
- Pump Efficiency**: A star rating system showing "3 Stars" (marked with a red 5). The stars are represented by a row of 10 star icons, with the first three filled and the remaining seven outlined. Below the stars is a slider bar with a circular handle.

At the bottom of the form, there is a note: "\*Increments of 0.5 Stars, Minimum Stars: 1".

## Solar PV System

### Overview

FirstRate5 Whole of Home allows you to specify a rooftop solar PV system to generate on-site renewable electricity. The tool will produce the hourly output of the solar PV system based on the NatHERS climate data for the climate zone the dwelling house is in. The output from the PV system accounts for the angle of the sun and the ambient air temperature during the day, and takes into account typical losses associated with soiling, DC wiring and conversion from DC to AC in the inverter. It does not take into account any reduced output caused by objects that may be shading the roof at different times of the year or day.

You will need to specify the maximum output of the inverter in kilowatts (kW), with 5kW being the default setting. The power output of the solar PV system is clipped to the inverter rating if the total output of the solar PV system exceeds the inverter rating for a given hour.

You will also need to specify a solar PV system export cap, with 5 kW being the default setting. This sets a limit on the amount of power that can be exported back to the electricity grid.

### Specifying the solar PV system

To start you need to click the 'Add solar array' button. If a solar PV system is split over multiple orientations, you will need to add more than one array. After you enter the details for each array, you will then need to enter the details for the inverter and the export cap. Click the 'Duplicate array' button to copy an existing solar array.

Follow the steps below to enter the information for each solar PV array.

#### Steps

1. Specify the azimuth of the solar PV array in degrees.
2. Specify the angle above horizontal of the solar PV array.
3. Specify the total kilowatt capacity of the solar PV array.
4. Specify the PV system export cap. This sets a limit on the amount of power that can be exported back to the electricity grid and is usually set the electricity distributor.
5. Specify the maximum output of the inverter. The power output of the PV system is clipped to the inverter rating if the total capacity of the PV system exceeds the inverter rating.




## \* Solar panels and battery storage

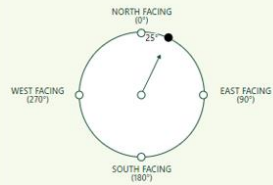
### Solar panel orientation

#### Solar Panel Group 1

kW - Azimuth

Show details 

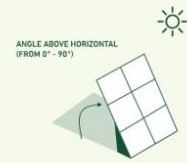
What direction will the solar panels face?



Enter azimuth from true North - 0 - 359°

25 deg **1**

What is the angle above horizontal?



Enter angle 0 - 90°

22.5 deg **2**

What is the total kW capacity of this panel set?

6.6 kW **3**

 Duplicate array  Delete array

The total capacity of the solar system is 6.6 kW

The total of all PV arrays you have entered is displayed here.

PV system export cap

5 kW **4**

Maximum output of inverter

5 kW **5**

## Battery

### Overview

FirstRate5 Whole of Home allows you to specify a battery for an assessment. A battery stores excess electricity that is generated by the PV system during the day, for use in the evening or morning. This makes more effective use of the electricity generated by the solar PV system because it reduces the amount of electricity that is exported to the grid and increases the amount of mains electricity that is replaced (or offset) by the solar PV system. This reduces energy bills as the feed-in tariff paid for exported electricity is generally much lower than the mains electricity tariff. If you select the battery option, the size of the battery is specified by its storage capacity in kilowatt-hours (kWh).

Lithium-Ion, lead acid and zinc bromine battery types can be selected in FirstRate5 Whole of Home. Other battery types are currently not included in NatHERS software and therefore cannot be included in a Whole of Home assessment.

### Specifying a battery

Follow the steps below to enter the information for a battery.

#### Steps

1. If the assessed dwelling has a battery, select 'Yes'.
2. Specify the storage capacity of the battery in kilowatt-hours (kWh).
3. Select the battery type from the dropdown list.

The screenshot shows a form with three fields. The first field, 'Is there battery storage?', has radio buttons for 'Yes' (selected) and 'No'. A red circle with the number '1' is next to the 'Yes' option. The second field, 'Storage capacity of battery', is a text input with '10' and a 'kWh' unit selector. A red circle with the number '2' is above the input. The third field, 'Battery Type', is a dropdown menu with 'Lithium-Ion' selected. A red circle with the number '3' is above the dropdown.

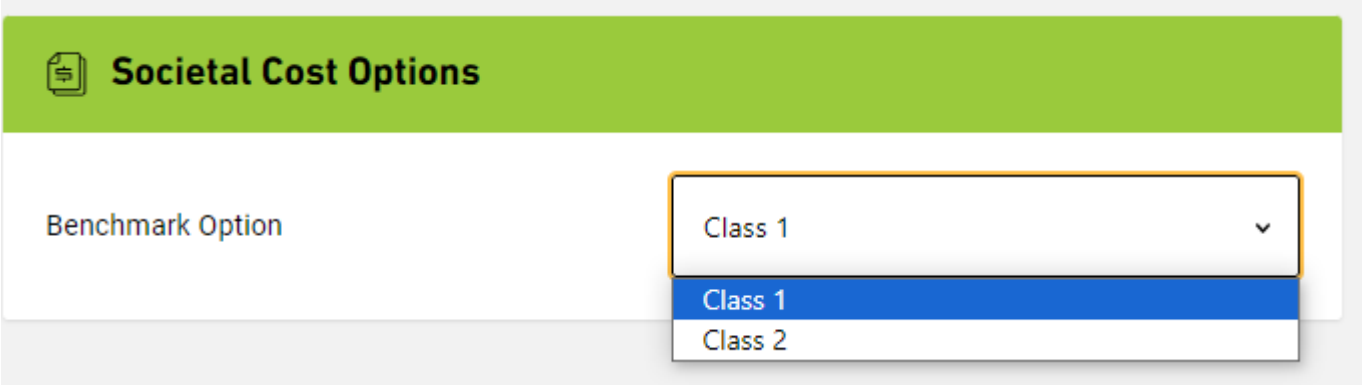
Is there battery storage?	<input checked="" type="radio"/> Yes <b>1</b> <input type="radio"/> No
Storage capacity of battery	10 kWh <b>2</b>
Battery Type	Lithium-Ion <b>3</b>

# Societal Cost Options

## Overview

In FirstRate5 Whole of Home you will need to specify if the assessment is for a Class 1 or Class 2 dwelling. Simply select the relevant choice from the drop-down list.

The building class is used when calculating the Target Energy Value. To pass the Energy Value requirement, the assessed dwelling must achieve a Net Energy Value equal to or less than the Target Energy Value.



## Analytics and Summary Information

### Overview

FirstRate5 Whole of Home provides a range of analytics and summary information for each assessment. This information will assist you understand the how the choices you have made impact upon energy use, greenhouse gas emissions, energy cost, energy value and the Whole of Home score.

Below is a brief description of the main metrics reported in FirstRate5 Whole of Home.

- **Energy Use:** The Energy Use of all appliance end-uses, solar PV and battery is reported in megajoules (MJ). This allows for a common metric to be used for all fuel sources. In some cases, the MJ value reported for an end use will be a sum of two fuels type. For example, if gas ducted heating is specified, the heating energy value will include both gas and electricity used by the heating system.
- **Greenhouse Gas Emissions:** The greenhouse gas values are calculated using 2023 greenhouse gas coefficients.
- **Energy Cost:** The Energy Cost values are calculated using typical energy tariffs for each state and territory compiled by Sustainability Victoria. The cost includes any supply charges.
- **Energy Value:** The Energy Value is the cost of all appliance end-uses and any offset provided by a PV system and battery, calculated using tariffs developed that include a cost of carbon. These tariffs have been developed by the NatHERS Administrator and are used when calculating the Whole of Home score.
- **Target & Net Energy Values:** The Target Energy Value is the Energy Value calculated for a benchmark 7 Star dwelling with an equivalent floor area, climate zone and building class as the assessed dwelling. The benchmark dwelling uses a fixed set of average appliances. To meet the NCC 2022 Whole of Home compliance requirements, the Net Energy Value of the assessed dwelling needs to be equal to or less than the Target Energy Value calculated for the benchmark dwelling.
- **Whole of Home Performance Rating:** The Whole of Home Performance Rating is calculated by using the Target Energy Value and the Net Energy Value results. Under NCC 2022 a Class 1 dwelling will need to achieve a rating of 60, and a Class 2 dwelling will need to achieve a rating of 50.

### Project Summary Page

Each project has a project summary page that presents all the main information for the assessed dwelling. You access this page by clicking the 'View' button on the main project page that lists all project. The main sections of the Summary page are described below.

#### Sections

1. The top section of this page provides a summary of the FirstRate5 project details, including the NatHERS rating and climate zone.
2. This section shows the selections made for heating and cooling, fixed appliances, plug-in appliances and lighting, swimming pool, and the PV system and battery.
3. This section displays the Whole of Home Performance Rating and information about annual greenhouse gas emissions, energy use, energy value and energy costs. You can use the dropdown menu in the box underneath the Whole of Home score to toggle between the different metrics. The

debt/offset box will indicate if the emissions, energy cost, energy use or emissions 'debt' has been offset by the energy/income generated by a solar PV system.

4. The bottom section the page below what is displayed, contains the Analytics section. This section contains graphs to provide more details on energy use, costs, and greenhouse gas emissions, broken down by end-use and month.

**Sustainability Victoria** FirstRate5 Whole-of-Home General Mainstay

AT @HEWPA - SAP 200 CZ 60 v5.5.3 LL

### SAP 200 CZ 60 v5.5.3 LL

#### FirstRate5 project details

##### Summary

PROJECT NAME SAP 200 CZ 60 v5.5.3 LL	NATHERS RATING <b>6.4 stars</b>
ISSUE DATE 08/11/2023	STATUS <b>In progress</b>
CERTIFICATE ID <a href="#">SJTMMASDQWV10</a>	LOCATION NAME Tullamarine

[View NatHERS Certificate of](#)

#### Whole-of-Home details

##### Heating and cooling

Heater type  
Heater 1 - Not selected

Default Heater  
WIR 5, KITCHEN/MEALS, BED 5, ENS 5,  
LIVING, LOUNGE, ENTRY, HALL, BED 2, WIR  
1, BED 1, ENS 1, BED 3, BED 4, WC

Cooler type  
Cooler 1 - Not selected

Default Cooler  
WIR 5, KITCHEN/MEALS, BED 5, ENS 5,  
LIVING, LOUNGE, ENTRY, HALL, BED 2, WIR  
1, BED 1, ENS 1, BED 3, BED 4, WC

Annual energy use	8,391 MJ
Annual energy cost	\$522
Annual greenhouse gas emissions	2.34 tonnes

##### Your current score is 52 / 150

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

LOW ENERGY PERFORMANCE HIGH ENERGY PERFORMANCE

##### Annual greenhouse gas emissions

Debit	5.32 tonnes
Offsets	0.00 tonnes
Net Emissions	5.32 tonnes

Emissions based on 2023 greenhouse gas coefficients.

100% of emissions offset?  No

##### Annual totals

Net energy usage	19,055 MJ
Net energy cost	\$1,572
Net energy value	\$1510

# Edit Project Page

When you enter a project to edit it, there is an analytics panel on the right-hand side. The Whole of Home score and a breakdown of annual greenhouse gas emissions, energy cost, energy use and energy value are displayed. You can use the dropdown menu to toggle between the different metrics. The information will update each time you click the 'Save and update' button.

### Heating

The following NatHERS conditioned zones can be assigned to a heater you specify.

Note: Any unallocated zones will be allocated to the default heater when the whole of home rating is calculated.

Conditioned zones

WIR 5	KITCHEN/MEALS	BED 5
ENS 5	LIVING	LOUNGE
ENTRY	HALL	BED 2
WIR 1	BED 1	ENS 1
BED 3	BED 4	WC

---

#### Heater 1

1kW - Ducted RAC - fixed capacity [Hide details](#)

System category:

Heater type:

Age of ductwork:

Efficiency rating:  Old rating  New rating

Efficiency: 2.50 HSPF 1 stars

Capacity:  kW

Max. hourly heating demand is 0.0kW

### Analytics panel

Your current score is 52 / 150

Annual greenhouse gas emissions

Debt	Offsets	Net Emissions
5.32 TONNES	0.00 TONNES	5.32 TONNES

100% of emissions offset?  Yes  No

Annual costs

Heating and cooling	\$522
Water Heating	\$0
Cooking equipment	\$0
Plug-in appliances	\$534
Lighting	\$130
Pool	\$0
Solar panels and battery storage	\$0
Supply charges	\$387
<b>Total:</b>	<b>\$1,572</b>

## Charts on Project Summary Page

There are three charts displayed in the bottom section of the project summary page.

### 1. Monthly Profile

This chart provides a monthly breakdown of the main energy end-use areas (multi-coloured column). If you hover the cursor over this column, you get a table showing the monthly breakdown. Green columns show the monthly offset provided by the PV and battery system.

Use the drop-down list to toggle between Costs, Energy and Emissions graphs.

### 2. Monthly Profile: Electricity vs Gas

Provides a monthly breakdown of electricity and gas use. If you hover the cursor over this column, you get a table showing the monthly breakdown of either electricity or gas. Green columns show the monthly offset provided by the PV and battery system.

Use the drop-down list to toggle between Costs, Energy and Emissions graphs.

### 3. Annual Consumption

There are two charts in this section. The first provides a breakdown of annual total electricity and gas use. The second provides a breakdown of annual energy use by appliance end-use.

You can hover over the sections to get a detailed information. If you click on an item on the chart legend, this will remove it from the chart.

# Analytics

