RapidRate™ Thermal Calculator User Guide

Introduction

RapidRate™ is a tool developed by CSIRO, using Artificial Intelligence techniques, that can quickly rate the energy efficiency of a dwelling using a relatively small number of inputs.

RapidRate™ Thermal Calculator generates an estimated Star Rating that is aligned with the Nationwide House Energy Rating Scheme (NatHERS). It also generates estimated heating energy and estimated cooling energy. RapidRate™ is not an official NatHERS accredited tool.

This document gives guidance on how to use the RapidRate™ Thermal Calculator.

Accessing RapidRate™ Thermal Calculator

RapidRate™ Thermal Calculator is accessible using this link: RapidRate™ Thermal

Entering input data

The inputs required by RapidRate™ Thermal Calculator are described in Table 1.

Figure 1 shows what the RapidRate™ Thermal Calculator input screen looks like.

Getting results

Once all input values have been entered, click on 'Analyse' and the RapidRate™ outputs will be displayed. RapidRate™ Thermal Calculator outputs are described in Table 2.

If a mistake has been made with any of the inputs or you want to experiment with different input values, close the results window, change any of the input values as required, then click 'Analyse' again.

Figure 2 shows what the RapidRate™ Thermal Calculator output screen looks like.

More information

Further details about RapidRate™ are available at RapidRate - Australian Housing Data.

Disclaimer

The RapidRate™ software used to calculate the star rating and outputs is not accredited software under the Nationwide House Energy Rating Scheme (NatHERS) and any star rating or other outputs generated represents an estimated NatHERS star rating and is not a replacement for a NatHERS Certificate.

While the software has been created with due care, the information used to train the software will continue to develop over time, and there is no warranty or representation that the star rating or other outputs are free from errors or omissions or generated with appropriate or accurate assumptions.

The star rating and other outputs are estimated based on certain inputs and assumptions, and no claim is made as to the accuracy, completeness, reliability, currency, suitability or otherwise of the star rating or other outputs, especially where input data is based on assumptions.

The star rating and other outputs are provided on the basis that the end user receiving the star rating and other outputs are responsible for assessing whether it will meet their requirements and be fit or suitable for that person's or organisation's purpose or intended use.

Input data

Table 1: RapidRate™ Thermal Calculator user inputs

RapidRate Input	Valid values	Definitions	Notes
Post code	Valid Australian postcode		
NCC class	House/Townhouse Apartment	NCC Class 1a NCC Class 2	
Project type	New Existing Renovation	Built since 2010 Built before 2010 without major renovation Built before 2010 and has undergone a major renovation since 2010	
Site exposure type	Suburban Open Exposed Protected	Numerous closely spaced obstructions below 10 m. Examples: Suburban housing, heavily vegetated bushland areas, townhouses. Grasslands with few well scattered obstructions below 10 m. Examples: Farmland with scattered sheds, lightly vegetated bush blocks, elevated units with a few obstructions of similar height to the dwelling Few or no obstructions. Examples: Flat grazing land, lake-side, ocean-frontage, desert, exposed high-rise unit without obstructions at a similar height to the dwelling Numerous closely spaced obstructions over 10 m. Examples: City and industrial areas	Reference: NatHERS Technical Note
Main floor construction type	AAC (Autoclaved aerated concrete) Concrete ConcreteSlab ConcreteSuspended ConcreteWafflePod ConcreteSlabOnGround Plasterboard TimberSuspended Unclassified UnitBelow	Use 'UnitBelow' for apartments where there is a neighbour directly below the apartment being assessed	Up to 3 floor construction types can be passed to RapidRate, along with a percentage of each construction type
Floor insulation R-value	0-12	R-value is a measure of how well a layer of insulation resists the flow of heat. The higher the R-value the better the performance. For RapidRate, R-Value can range from 0 (no insulation) to 12	If available, use documentation (such as dwelling building plans) to determine insulation level.
Floor area - conditioned	Area in square metres	For RapidRate, most spaces within the home are categorised as 'conditioned', except for most bathrooms, WCs, laundries, and garages. (However, bathrooms, WCs, laundries, and garages which do not have an external wall; or which cannot be closed off from other conditioned spaces; or which are artificially heated/cooled are categorised as 'conditioned').	For RapidRate, floor area is the area *inside* the building envelope.

RapidRate Input	Valid values	Definitions	Notes
Floor area - unconditioned	Area in square metres	Every dwelling must have at least one unconditioned space. Unconditioned spaces include bathrooms, WCs, laundries and garages which have an external wall; can be closed off from other conditioned spaces; and are not artificially heated/cooled.	For RapidRate, floor area is the area *inside* the building envelope.
Floor area - garage	Area in square metres	Only include attached enclosed garages	For RapidRate, floor area is the area *inside* the building envelope.
Main external wall construction type	BrickVeneer CladFibreCement CladWeatherboard CladTimber CladMetal CladInsulatedPanel CladAAC CladOther ConcretePanel ConcreteOther ConcreteBlock Earth InsulatedConcreteFormwork MasonrySingleBrick MasonryCavity MasonryOther Other PartyWall Plasterboard ReverseBrickVeneer RetainingWall StructuralInsulatedPanel Strawbale	Use 'PartyWall' for apartments or townhouses where there is a neighbour directly on the other side of a wall	Up to 3 external wall construction types can be passed to RapidRate, with a percentage of each
External wall insulation R-value	0-12	R-value is a measure of how well a layer of insulation resists the flow of heat. The higher the R-value the better the performance. For RapidRate, R-Value can range from 0 (no insulation) to 12	If available, use documentation (such as dwelling building plans) to determine insulation level.
External wall area by orientation	Area in square metres broken down by orientation	1. External wall area includes any windows or doors that may be set in the external wall. 2. Orientation must be based on the rotation of the dwelling relative to true north, not magnetic north. 3. Orientation (*direction*) must be one of 16 values: N, NE, NNE, NNW, NW, E, ENE, ESE, S, SE, SSE, SW, SSW, W, WSW, WNW.	Tick the 'Show all cardinal directions' to get all 16 orientation options

RapidRate Input	Valid values	Definitions	Notes
		4. Wall height is the measurement between the finished floor level and the finished ceiling level. If the wall height varies, use the average wall height.	
Window area by orientation	Area in square metres broken down by orientation	1. Window area includes all windows at a particular orientation, whether single or double glazed 2. Orientation must be based on the rotation of the dwelling relative to true north, not magnetic north. 3. Orientation (*direction*) must be one of 16 values: N, NE, NNE, NNW, NW, E, ENE, ESE, S, SE, SSE, SW, SSW, W, WSW, WNW.	Tick the 'Show all cardinal directions' to get all 16 orientation options
Window area double glazed by orientation	Area in square metres broken down by orientation	1. Window area double glazed includes all windows at a particular orientation that are double glazed 2. Orientation must be based on the rotation of the dwelling relative to true north, not magnetic north. 3. Orientation (*direction*) must be one of 16 values: N, NE, NNE, NNW, NW, E, ENE, ESE, S, SE, SSE, SW, SSW, W, WSW, WNW.	Tick the 'Show all cardinal directions' to get all 16 orientation options
Main roof construction type	Metal Tiles Concrete Mixed None Ceiling Unclassified	Use 'None' for apartments where there is a neighbour directly above the apartment being assessed	
Ceiling insulation R-value	0-12	R-value is a measure of how well a layer of insulation resists the flow of heat. The higher the R-value the better the performance. For RapidRate, R-Value can range from 0 (no insulation) to 12	If available, use documentation (such as dwelling building plans) to determine insulation level.
Roof insulation R-value	0-12	R-value is a measure of how well a layer of insulation resists the flow of heat. The higher the R-value the better the performance. For RapidRate, R-Value can range from 0 (no insulation) to 12	If available, use documentation (such as dwelling building plans) to determine insulation level.
Roof colour mean solar absorptance	0-1	Solar absorptance value	The **roof colour** drop down menu offers options for roof colour which will translate to a roof colour solar absorptance value. The value can be adjusted if desired.

Output data

Table 2: RapidRate™ Thermal Calculator outputs

Column name	Notes
Star rating	Estimated NatHERS star rating
Star rating lower bound estimate	Star rating prediction interval lower bound
Star rating upper bound estimate	Star rating prediction interval upper bound
Star rating prediction interval description	
Heating (MJ/m2/yr)	Energy load for heating
Heating lower bound estimate	Heating prediction interval lower bound
Heating upper bound estimate	Heating prediction interval upper bound
Heating prediction interval description	
Cooling (MJ/m2/yr)	Energy load for cooling
Cooling lower bound estimate	Cooling prediction interval lower bound
Cooling upper bound estimate	Cooling prediction interval upper bound
Cooling prediction interval description	

Input screen

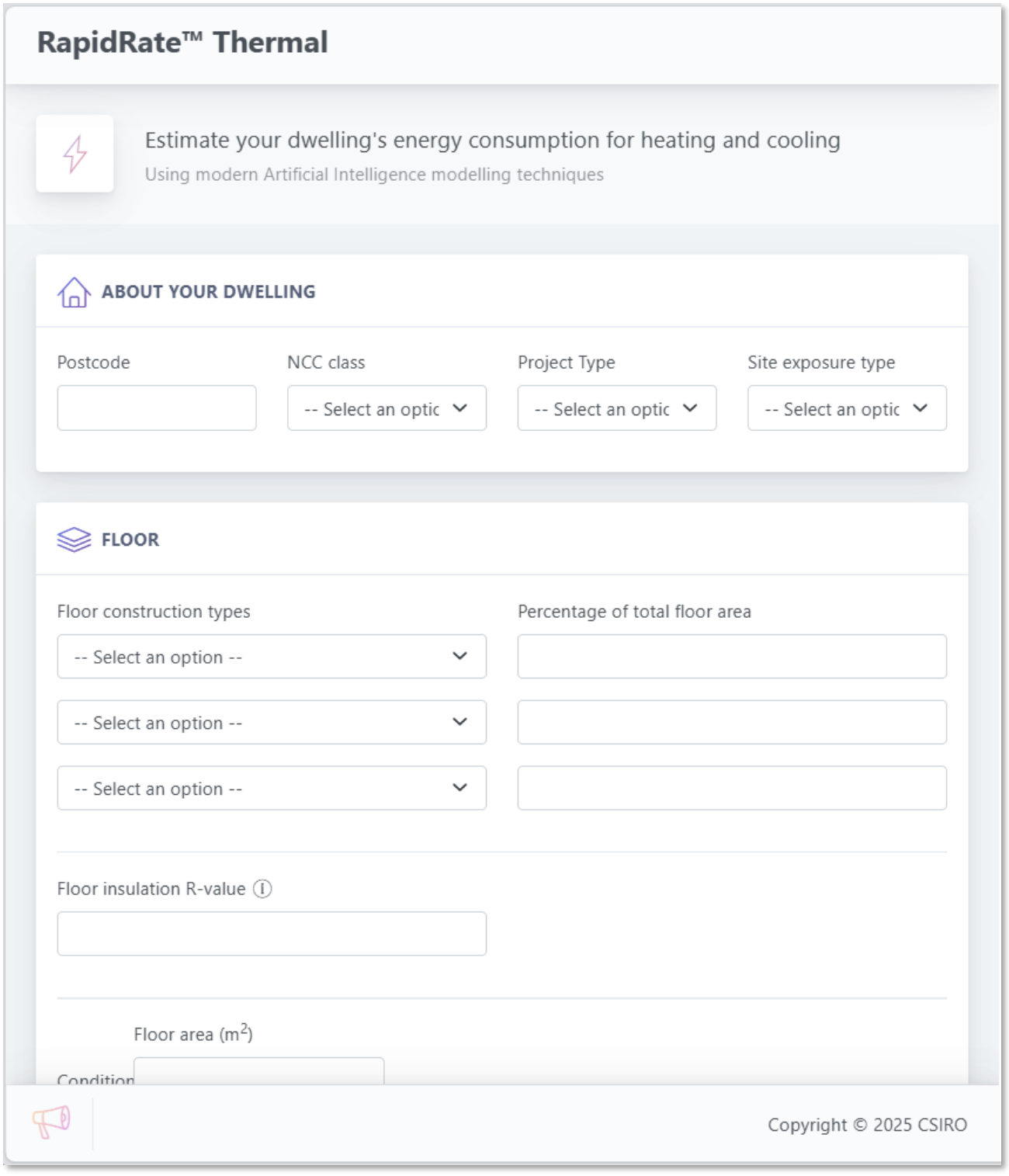

Figure 1. RapidRate™ Thermal Calculator data input page (top section)

Output screen

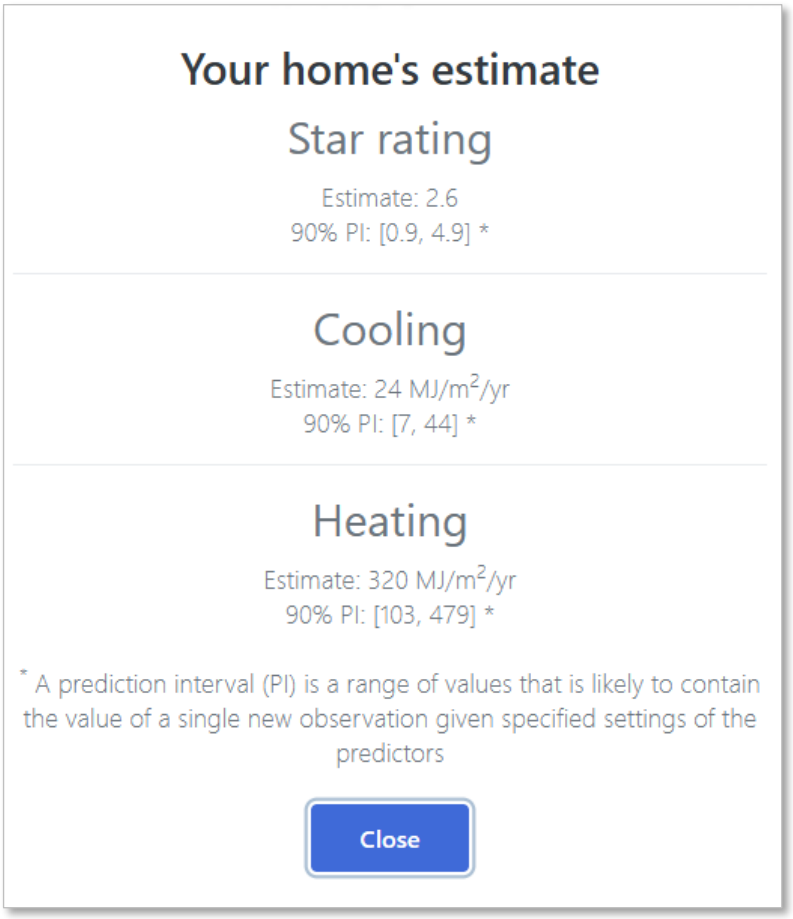

Figure 2. RapidRate™ Thermal Calculator results page