NatHERS Whole of Home Guidance Note for Assessors

Version 20240112

SUPERSEDED

Version register

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20240112	Aligned to the NatHERS Technical Note, expanded instructions on modelling heating and cooling appliances, simplified flowchart diagram, removed reference to pool heating and cleaning, summarised step 6 entering spa and pool details section; added notes on future development of hydronic heating and centralised services in apartment buildings, provided description of PV diverter types and added defaults table 2.

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1 Introduction

NatHERS Whole of Home considers the energy used by heating, cooling, cooking and plug-in appliances as well as hot water systems, lighting and pool and spa equipment, alongside the existing thermal star rating.

This NatHERS Whole of Home Guidance Note for assessors has been developed to help assessors understand and conduct NatHERS Whole of Home assessments. This guidance note is an interim document that introduces Whole of Home assessment and its relationship to NatHERS thermal assessments and National Construction Code compliance. This note will form the basis of a future chapter in the NatHERS Assessor Handbook.

1.1 Understanding the Whole of Home performance rating

The NatHERS Whole of Home assessments use the energy value of a dwelling to determine its performance and assign a rating from 0 to 150. Higher ratings correspond to a lower energy value, and better Whole of Home performance. A Whole of Home score of 100 equals a net zero energy value, thus any rating above this means there is a positive impact on the net cost of societal energy use.

Reference dwelling

The performance rating is calculated based on how the assessed dwelling performs compared with a reference dwelling – a score of 50 means that the dwelling design has the same performance as the reference dwelling. The reference dwelling has the following characteristics:

- 7-star thermal shell
- 3-star ducted heat pump (reverse-cycle air-conditioning) for heating and cooling (based on the 2019 Greenhouse and Energy Minimum Standards Determination for air-conditioners)
- 5-star instantaneous gas hot water
- lighting power density of 4 watts per square metre (W/m^2)[1]
- no spa or pool
- no onsite energy production or storage.

Whole of Home assessment basics

Understanding how the assessment is calculated will help designers and assessors maximise the performance rating for a dwelling.

The relationship between the NatHERS thermal rating and the Whole of Home performance rating means that increasing thermal performance will increase the Whole of Home performance rating. This is because the heating and cooling energy requirements will be lower in a dwelling with a higher thermal star rating.

[1] Note that the default lighting power for simulation is 5 W/m^2 based on NCC Housing Provisions 13.7.6 1a

Five key aspects are included in a Whole of Home assessment. These are:

- heating, cooling and hot water – specifying appliances that are more energy efficient will reduce energy use and result in a higher Whole of Home performance rating
- spas and pools – having a pool or spa in a dwelling will reduce the Whole of Home performance rating
- cooking loads
- plug loads
- onsite energy production and storage – including onsite energy production and storage systems will offset energy use, thereby helping to achieve the required Whole of Home performance rating (see also Energy value).

Energy value and the Whole of Home performance rating

Assessors should be aware of the energy value and its impact on the Whole of Home performance rating.

Energy value is the net cost to society of energy use, including costs to the building user, the environment and energy networks (as defined in the Housing Provisions of the Australian Building Codes Board – ABCB). It is a measure of the dwelling's energy performance, but it also considers the retail cost of the energy used and the greenhouse gas emissions that are produced during energy production.

The lower the energy value (net cost) of the modelled energy loads in the assessment, the higher the Whole of Home performance rating.

Two main factors affect the energy value of any given unit of energy consumed:

1. **Fuel type** – For example, electricity generated by coal-fired power stations has a higher energy value (i.e. cost) than electricity generated by a solar photovoltaic (PV) system. Thus, including solar PV in a housing design can reduce the energy value and improve the Whole of Home performance rating.
2. **Time of use** – For example, electricity sourced from the grid during the afternoon – when demand is typically higher – has a higher energy value than electricity consumed at other times.
   Thus, including battery storage, which can shift the times when energy is drawn from the grid, can reduce the energy value and improve the Whole of Home performance rating.

1.2 Using this guidance note

This guidance note is designed to help assessors complete a NatHERS Whole of Home assessment. The guidance note includes:

- a description of the key elements of a Whole of Home assessment
- important information to understand before starting an assessment
- step-by-step guidance for the Whole of Home assessment process
- tips on how to improve a rating

- when you need to resimulate a rating
- information on the NatHERS certificates.

All other aspects of the NatHERS assessment process are covered in more detail in the NatHERS Assessor Handbook.

NatHERS Technical Note

This guidance note should be read in conjunction with the NatHERS Technical Note, which contains the requirements that all assessors must follow when conducting a NatHERS assessment.

Note that the guidance in this guidance note is nonbinding; it supports but does not replace the use of the current NatHERS Technical Note. Where there appears to be conflicting information between the current NatHERS Technical Note and this guidance note, the NatHERS Technical Note takes precedence.

Alterations and additions

For the purposes of compliance, the application of the Whole of Home assessment is yet to be confirmed for alterations and additions. It is likely that this will vary between state and territory jurisdictions. This section will be updated when details are known.

1.3 Whole of Home software

Assessors must use NatHERS accredited software to obtain certification for a NatHERS assessment.

There are currently 4 software tools in Australia that are accredited for assessing compliance with the thermal energy efficiency requirements in the National Construction Code (NCC):

- AccuRate, developed by CSIRO
- BERS Pro, owned and maintained by Energy Inspection
- FirstRate5, developed by Sustainability Victoria
- HERO, developed by HERO Software.

All new assessments must be undertaken using the latest version of the chosen software unless an exemption is provided by the building authority in the relevant state or territory. Ensure the software is accredited for a Whole of Home assessment.

1.4 Further information

All enquiries and requests for more information should be referred to either:

- the software provider or
- the relevant assessor accrediting organisation (AAO) or
- the relevant state or territory building regulator.

All enquiries and comments specifically about this guidance note should be addressed to the NatHERS Administrator at admin@nathers.gov.au.

For further information, visit the NatHERS website: www.nathers.gov.au.

2 Conducting a NatHERS Whole of Home assessment

The NatHERS Whole of Home assessment builds on the NatHERS thermal assessment that is used to verify compliance with the energy efficiency performance requirements of the NCC.

For NCC 2022, there will be 2 energy efficiency performance requirements for residential buildings: the thermal performance and the energy usage performance.

A NatHERS assessment will verify compliance with both of these requirements:

- the thermal assessment and star rating will address thermal performance.
- the Whole of Home performance rating will address energy usage.

A NatHERS Whole of Home assessment is undertaken based on a completed NatHERS thermal assessment. The process for conducting a Whole of Home assessment follows a similar approach to the process for conducting a thermal assessment (Figure 1).

Assessors should collect the information needed for the assessment before entering data into the assessment software. An assessment may need to be iterative, with adjustments made to inputs to improve energy performance and meet regulatory requirements, before it is finalised, and the certificate issued.

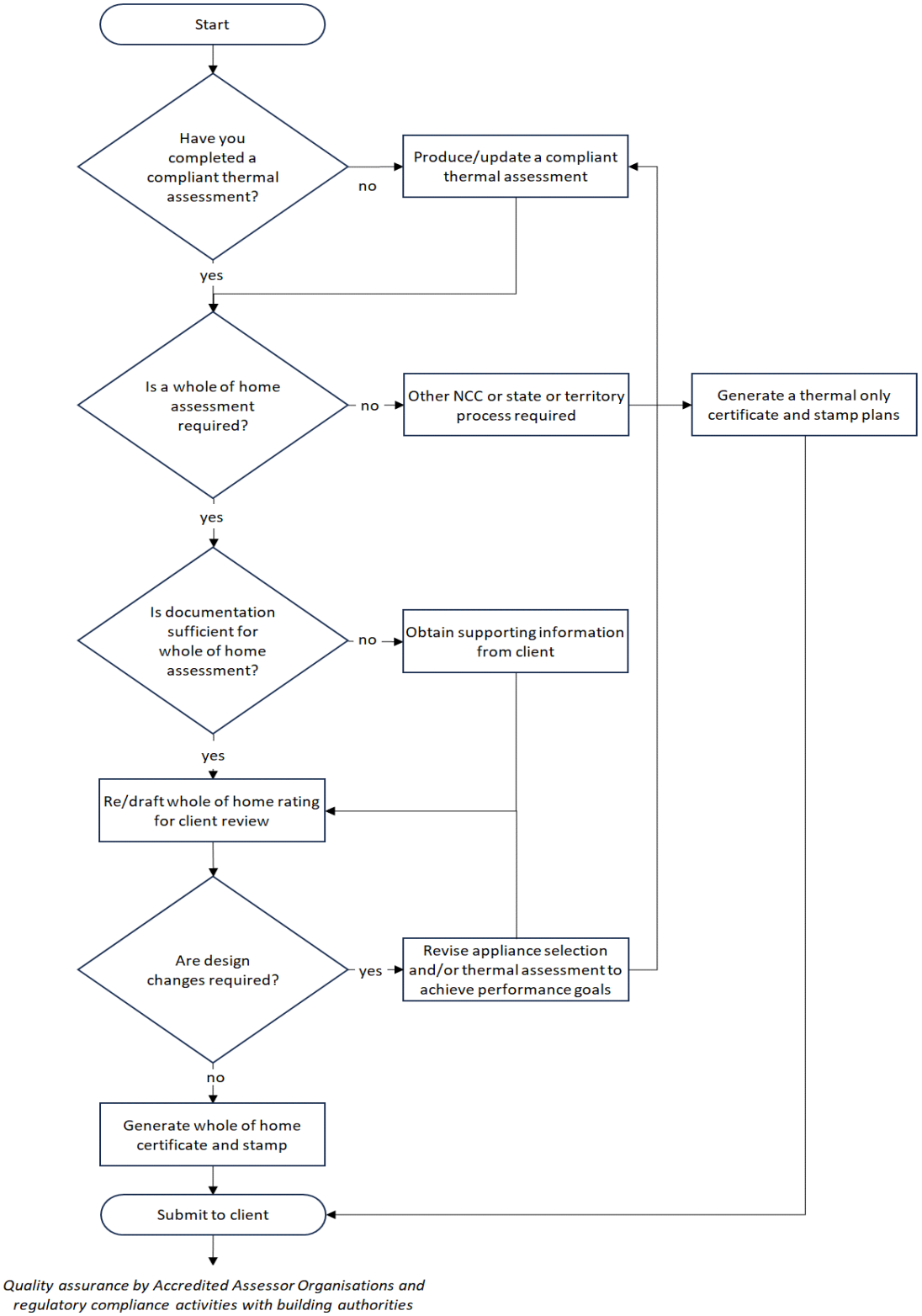


Figure 1: NatHERS Whole of Home assessment

2.1 Before you start

Before you start, ensure that you have the resources needed to conduct and complete the Whole of Home assessment.

Step 1 Access a completed NatHERS thermal rating

Ensure that the dwelling has a thermal rating that is compliant in the state or territory in which the dwelling will be constructed.

Step 2 Identify and collect information and documentation

In addition to documentation requirements for NatHERS thermal modelling, collect information for data input for the Whole of Home assessment. Retain all design, assessment and supporting documentation in line with the relevant jurisdiction's requirements and for auditing and quality assurance.

If the specified type of appliance is not available in the software, seek guidance from your AAO or the NatHERS Administrator and include this in the 'additional notes' section of the certificate.

The information required for the Whole of Home assessment is listed below.

Heating and cooling appliances

- Appliance types (ideally including models and sizes)
- appliance efficiencies (with metrics appropriate to the appliance types)
- mark-up of NatHERS conditioned zones to be serviced by the heating and cooling appliances (several different areas in a home may be heated/cooled, and different equipment may be specified in each of these areas).

Exclusions:

1. Apartment (Class 2 buildings or Class 4 parts of a building) centralised space conditioning services cannot be specified in NatHERS. The calculation method for centralised applications is currently being developed for future implementation.
2. Hydronic heating – a calculation method will be developed for future implementation.
3. In-slab heating – a calculation method will be developed for future implementation.
4. Plug-in appliances.

Hot water system

- Hot water service type (ideally including model and size)
- appliance efficiency (with metric appropriate to the appliance type).

Exclusion: Apartment (Class 2 buildings or Class 4 parts of a building) centralised hot water services cannot be specified in NatHERS. The calculation method for centralised applications is currently being developed for future implementation. In the interim apartments with centralised hot water should use either the Verification Using a Reference Building or a first

principles performance solution to demonstrate compliance with the Single Occupancy Unit energy budget.

Lighting

- Lighting power density measured in W/m^2.

Pool and spa pumps (if applicable)

- Pool or spa volume
- **Note** - if information on volume is not available (or able to be calculated based on surface area), this feature cannot to be included in the Whole of Home assessment.
- Pool pump model and type (single, double or multispeed).

Exclusion: heating for pools and spas is currently not considered in a NatHERS Whole of Home assessment.

On-site renewable energy generation and storage (if applicable)

- Rated sizes (in kilowatt – kW) of PV arrays (groups) – if there is more than one group of PV panels, then the size of each group is required
- azimuth (orientation) and inclination (slope) of PV arrays – if there is more than one array of PV panels, then these details are required for each array
- inverter size (kW) and export limits[2] (kW)
- where specified, battery type and capacity (in kW).

If the above information is not available, then on-site renewable energy generation and storage must not be included in the Whole of Home assessment.

Exclusion: centralised PV systems for Class 2 buildings or Class 4 parts of a building cannot currently be specified in NatHERS.

2.2 Data input

Ensure you enter all data and details accurately, and capture assumptions and other information in the 'additional notes' section which will appear on the certificate.

Step 3 Enter heating and cooling details

Identify all the areas of the dwelling design that will be serviced by fixed heating and/or cooling equipment (conditioned zones). A dwelling design might have a single conditioned zone (e.g. central heating/cooling in an open-plan home), or might have several different conditioned zones that are heated and cooled by different equipment.

[2] The default and limit are both 5 kW

Using the information you identified and collected, assign heating and cooling appliances to each conditioned zone:

- if a heating and cooling appliance is not specified, use the default value in accordance with the NatHERS Technical Note or Table 2 below
- if appliance details are specified, enter the type and efficiency of the appliance(s) as shown on documentation – note there may be more than one type of heating or cooling appliance specified for a zone
- if a ducted system is documented as supplying several zones, apply the heating or cooling appliance type to **all** zones serviced by the ducted system
- where design documentation is not specific about a heating or cooling appliance in a particular zone, 2 or more adjacent spaces may be considered to be served by the same space heating and cooling equipment provided that the spaces are the same type of zone for example either:
    - kitchen / living / daytime zones only, or
    - bedroom / night-time zones only.

    This means that 2 adjacent spaces where one is a daytime zone and one is a night-time zone cannot be served by the same space heating or cooling equipment except where:

    - the spaces are connected by a door or an opening, and
        - the total floor area of the space/s without space conditioning installed is not more than 30% of the floor area of the space where the space conditioning is installed,
          or
        - there is evidence demonstrating that the appliance was sized specifically to condition all spaces.
- multi-split systems that service multiple zones, must be modelled as individual non-ducted heat pump units in each serviced zone.

The heating appliance types available for selection in NatHERS Whole of Home software are:

- reverse-cycle air-conditioner (heat pump) – ducted and non-ducted/room
- gas heater - ducted and non-ducted/room
- electric resistive heater (an in-built appliance, not a plug-in appliance)
- slow-combustion wood heater.

The cooling appliance types available for selection in NatHERS Whole of Home software are:

- reverse-cycle air-conditioner (heat pump) – ducted and non-ducted/room
- evaporative cooler – ducted and non-ducted/room
  – refer **Table 1** for evaporative cooler climate suitability.

The range of appliances may expand as the NatHERS Whole of Home assessment method is further developed.

Table 1 - Evaporative cooler suitability in different climate zones

NatHERS climate zone	Location name	Evaporative cooler suitability
1	Darwin Airport	Not suitable
2	Port Hedland Airport	Not suitable
3	Longreach Aero	Marginal
4	Carnarvon Airport	Not suitable
5	Townsville Aero	Not suitable
6	Alice Springs	Suitable
7	Rockhampton Aero	Not suitable
8	Moree MO	Suitable
9	Amberley Aero	Not suitable
10	Brisbane AMO	Not suitable
11	Coffs Harbour MO	Not suitable
12	Geraldton Airport	Marginal
13	Perth Airport	Suitable
14	Armidale	Low cooling
15	Williamtown AMO	Not suitable
16	Adelaide (Kent Town)	Suitable
17	Sydney RO	Not suitable
18	Nowra RAN	Marginal
19	Charleville AMO	Suitable
20	Wagga AMO	Suitable
21	Melbourne RO	Suitable
22	East Sale AMO	Marginal
23	Launceston (Ti Tree Bend)	Low cooling
24	Canberra Airport	Suitable
25	Cabramurra	Low cooling
26	Hobart RO	Low cooling
27	Mildura AMO	Suitable
28	Richmond	Marginal
29	Weipa Aero	Not suitable
30	Wyndham PO	Not suitable
31	Willis Island	Not suitable
32	Cairns AMO	Not suitable
33	Broome Airport	Not suitable
34	Learmouth Airport	Marginal
35	Mackay MO	Not suitable
36	Gladstone Radar	Not suitable
37	Halls Creek Airport	Marginal
38	Tennant Creek	Marginal
39	Mount Isa AMO	Marginal
40	Newman	Suitable
41	Giles MO	Suitable
42	Meekatharra Airport	Suitable
43	Oodnadatta Airport	Suitable
44	Kalgoorlie	Suitable
45	Woomera Aerodrome	Suitable
46	Cobar AMO	Suitable
47	Bickley	Suitable
48	Dubbo Airport	Suitable
49	Katanning	Suitable
50	Oakey Aero	Marginal
51	Forrest AMO	Suitable
52	Swanbourne	Marginal
53	Ceduna	Suitable
54	Mandurah	Marginal
55	Esperance	Suitable
56	Mascot AMO	Not suitable
57	Manjimup	Suitable
58	Albany Airport	Low cooling
59	Mount Lofty	Low cooling
60	Tullamarine	Suitable
61	Mount Gambier AMO	Suitable
62	Moorabbin Airport	Suitable
63	Warrnambool	Low cooling
64	Cape Otway	Low cooling
65	Orange AP	Low cooling
66	Ballarat Aerodrome	Suitable
67	Low Head	Low cooling
68	Launceston AP	Low cooling
69	Thredbo Valley	Low cooling

Step 4 Enter hot water details

Assign hot water system type and efficiency:

- if hot water system type and efficiency is not available, use the default value in accordance with the NatHERS Technical Note or **Table 2** of this guidance note

- if hot water appliance details are specified, enter the appliance type and its performance value (if applicable) as shown in the documentation.

The water heater types available to be selected in NatHERS Whole of Home software are:

- solid-fuel heater
- heat pump
- off-peak electric storage (assumes 'large' volume electric resistive hot water cylinder, heated mainly overnight)
- continuous electric storage (assumes 'small' volume hot water cylinder, with heat on-demand)
- instantaneous electric
- electric boosted solar thermal
- gas boosted solar thermal
- gas storage
- gas instantaneous
- solar PV diverter water heaters.

  Solar photo voltaic diverters (PVDs) divert surplus energy from your solar power system to your hot water system. There are three types of diverters.

  - **Type 1: Simple timer**
    These systems are a standard electric storage hot water system with a timer installed so that they heat water during the day rather than overnight.

  - **Type 2: Modulated input into an existing storage tank – add-on product**
    This type of system has a retrofitted external control added to an existing standard electric storage hot water system. The controller monitors the house load and local PV generation and diverts any excess local PV generation to the water heater where possible.

  - **Type 3: Bespoke PV Diverter - dedicated product**
    This is a specially designed PV solar diverter hot water system. The controller is able to monitor the house load and local PV generation and diverts excess solar energy to the water heater.

  If a solar PV diverter water heater is modelled, evidence of the energisation profile for the diverter type is required. When choosing a PV diverter, the software tool may not be able to model a battery in the same assessment.

Step 5 Enter lighting details

Lighting energy use is calculated using lighting density (W/m^2).

- For software that supports it, calculate the lighting density of the house using the ABCB lighting calculator and enter it into the software
- for software that does not allow input of the lighting density calculation or, if you do not have the lighting specifications, apply the default lighting density of 5 W/m^2.

Step 6 Enter spa and pool details (if applicable)

If spas and pools are shown on the documentation, they must be included in the Whole of Home assessment. The energy calculation will consider the energy use of pumps. Heating for pools and spas is currently not included in the Whole of Home energy calculations.

For spa and pool volume, enter the details as follows:

- enter the volume - if pool volume is not known, it can be estimated based on the surface area.

$$volume\ (L) = surface\ area\ (m^2) \times depth\ (1.5m) \times 1000$$

For pool pumping enter the details as follows:

- if pool pumping information is included in the documentation, enter the equipment type (e.g. single, dual, or multispeed pump)
- pool pump model and type (single, double or multispeed) - if the software tool has the functionality to enter pump star ratings, the assessor may enter those
- if star ratings are not able to be entered, the software will apply default values in the backend as set out in **Table 2** of this guidance note.

Step 7 Enter onsite renewable energy details (if applicable)

Incorporating renewable energy generation in the NatHERS Whole of Home assessment allows households to offset their modelled energy use. In many cases, onsite renewable energy may be needed for a project to pass the Whole of Home performance rating requirement. Or, if the target rating is more ambitious, onsite renewable energy can be used to move towards a net zero home.

Renewable energy in the NatHERS Whole of Home assessment is limited to solar PV systems.

The available solar radiation at the location of the dwelling is assigned based on the climate zone used for the assessment. The Whole of Home software calculates the hourly available electrical supply from a PV installation for the whole year. This calculation takes into consideration the:

- location and climatic conditions
- slope and orientation of the PV panels
- rated output of the array
- size of the system inverter
- export capacity of the system.

Note: Any shading above PV systems is currently not included in NatHERS.

Assessors should enter the details for both the system and the panels. Each separate array (groups of panels with a different orientation and/or slope) must be entered individually into the Whole of Home software. The system details to be entered are:

- the rated PV system size (kW; number of panels × watts per panel/1,000)

- PV array azimuth (orientation); if panels are oriented due north, the azimuth can be entered as 0 or 360˚ (note that orientation must be relative to true north, not magnetic north – see Section 4 of the NatHERS Assessor Handbook)
- PV array slope or inclination (i.e. the angle above horizontal that the panels are elevated); angle between 0 and 90°
- the capacity of the specified inverter (kW)
- the PV energy export set at a default of 5 kW per phase because this is the limit in most jurisdictions around Australia. Alternative values in an assessment must provide evidence to support a higher limit
- if a PV diverter hot water is specified, enter the relevant details as part of the hot water module (see Step 4).

Step 8 Enter onsite energy storage details (if applicable)

Where the output from solar PV exceeds the hourly demand for electricity in any given hour, then a battery may be used to store that excess generation for use at a later time (e.g. at night).

Installing a battery system can significantly improve performance on the Whole of Home performance rating. It allows the household to retain and use a greater proportion of the electricity generated onsite, which reduces the need to import from the grid during shoulder and peak times. Since the energy value of imports is higher than that of exports, reducing imports is more effective than increasing exports for improving the performance rating.

Two parameters are required for the NatHERS Whole of Home software to calculate the impact of the battery storage system on the energy calculations. If an onsite storage system is specified in the documentation, enter the:

- battery technology type - battery types are:
    - lithium ion
    - lead acid
    - zinc bromine

  (other battery types may be added to the Whole of Home software in future iterations of the assessment method)

- battery nominal storage capacity (kilowatt-hour).

To maintain consistency in ratings, default values are used for all other characteristics, based on battery technology type. These characteristics are:

- maximum depth of discharge
- charge efficiency
- discharge efficiency
- battery charge rate
- round-trip efficiency

- assumed initial battery charge.

If more detailed information about onsite battery characteristics is available, this may be entered if there is documentation to justify it, otherwise the default values should be used.

Step 9 Enter cooking appliance energy source and technology

The Whole of Home software estimates the energy used by cooking in the Whole of Home assessment. Assessors are required to enter the energy source of the cooking appliances. The options for cooktops are:

- gas
- electricity
- induction

The options for ovens are:

- gas
- electricity.

If energy source(s)/technology for cooking appliances are not specified, refer to the default energy source(s) in the NatHERS Technical Note or **Table 2** of this guidance note.

Other notes and considerations

Plug-load

Whole of Home software estimates energy used by plug-in appliances in the Whole of Home assessment, based on the number of occupants for the dwelling. Plug-load covers all other electrical equipment, apart from appliances noted above. It includes items such as whitegoods, audio visual equipment, small appliances, computers and peripherals, other electronics, standby power and plug-in electric cooking equipment, such as microwave ovens.

Assessors are not required to enter any information about plug-loads. However, you should be aware that the electricity used by plug-in appliances will affect the overall energy use of the home and the Whole of Home rating.

Being aware of the plug-load is particularly important in relation to solar PV generation (if installed, see **Step 7**). These loads can consume a considerable amount of electricity, which will be reflected in the calculation done by the software.

Default values

If any of the information required to perform a Whole of Home assessment is not provided, assessors must use the default values in **Table 2**. Assessors should encourage their clients to provide accurate information and advise them that defaults may represent the worst-case scenario and the rating may be adversely affected. Any defaults used for the assessment must be detailed in the NatHERS Certificate ‘additional notes’.

Table 2 - Default values for appliances

Appliance or system	Technology	Performance level / rating
Heating in cold[a] climate	Room reverse cycle air conditioner	HSPF: 2.5 Star rating: 1.0[d]
Heating in mixed/average[b] climate	Room reverse cycle air conditioner	HSPF: 3.5 Star rating: 2.0[d]
Heating in hot[c] and humid climate	Room reverse cycle air conditioner	HSPF: 4.0 Star rating: 2.5[d]
Cooling in cold[a] climate	Room reverse cycle air conditioner	TCSPF: 3.5 Star rating: 2.0[d]
Cooling in mixed/average[b] climate	Room reverse cycle air conditioner	TCSPF: 3.5 Star rating: 2.0[d]
Cooling in hot[c] and humid climate	Room reverse cycle air conditioner	TCSPF: 4.0 Star rating: 2.0[d]
Wood heater	Slow combustion	60%
Hot water	**Choose one of two options:** Gas storage system where reticulated gas is available at the dwelling (i.e., at least 1 gas appliance has been specified in the dwelling)	Heater star rating: 4.0
	OR Electric storage hot water system – off peak, where reticulated gas is not available at the dwelling (i.e., no gas appliances have been specified for the dwelling).	Performance not entered by assessor
Lighting	5 W/m^2	
Cooktops	**Choose one of two options:** Gas where reticulated gas is available at the dwelling (i.e., at least 1 gas appliance has been specified in the dwelling)	Performance not entered by assessor
	OR Electric where reticulated gas is not available at the dwelling (i.e., no other gas appliances have been specified for the dwelling).	Performance not entered by assessor
Ovens	Electric	Performance not entered by assessor
Pools and spas	System cannot be included in rating if not specified in design documentation	N.A.
Pools and pumps star ratings	Single speed: Dual speed: Multi-speed/variable:	1 star 3 stars 5 stars
Solar PV	System cannot be included in rating if not specified in design documentation	N.A.
Solar PV inclination (slope)		Same as documented roof pitch where array will be installed
Solar PV direction (azimuth)		Same as documented roof direction where the array will be installed
Solar PV inverter capacity		Total system size (kW) x 0.75

a Cold climates zones:
14, 18, 20, 21, 22, 23, 24, 25, 26, 47, 48, 49, 55, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69

b Mixed/average climate zones:
6, 8, 9, 11, 12, 13, 15, 16, 17, 19, 27, 28, 41, 42, 43, 44, 45, 46, 50, 51, 52, 53, 54, 56
c Hot / humid climate zones:
1, 2, 3, 4, 5, 7, 10, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40
d Star ratings and performance levels rated under 2019 GEMS determination

2.3 Final processes

Once the data has been entered, you can finalise the assessment.

Step 10 Run the Whole of Home calculation

When inputs have been completed as per Steps 3–9, the Whole of Home energy calculation can be run:

- if the Whole of Home performance rating complies with your regulatory requirements, you may move to the next step

- if the Whole of Home performance rating does not comply, then further discussion may be required with the designer or client on how to achieve compliance or optimise the design towards net zero (refer to ***Figure 1: NatHERS Whole of Home assessment***). Return to **Step 2 Identify and collect information and documentation** and adjust the specifications and inputs as necessary, in consultation with the designer and client.

- Where possible, encourage your client to optimise the design beyond minimum compliance towards net zero.

Step 11 Generate the NatHERS certificate and mini certificate (stamp)

Once a complying Whole of Home performance rating has been achieved and the documentation is finalised, you can generate the NatHERS certificate and mini certificate (stamp), using NatHERS software in conjunction with an online certification portal. Refer to the relevant software tool manual on how to generate the certificates.

Step 12 Stamp drawings to provide to client with the NatHERS certificate

Follow the AAO and NatHERS requirements (see Section 10 of the NatHERS assessor handbook) on stamp documentation for building approval purposes.

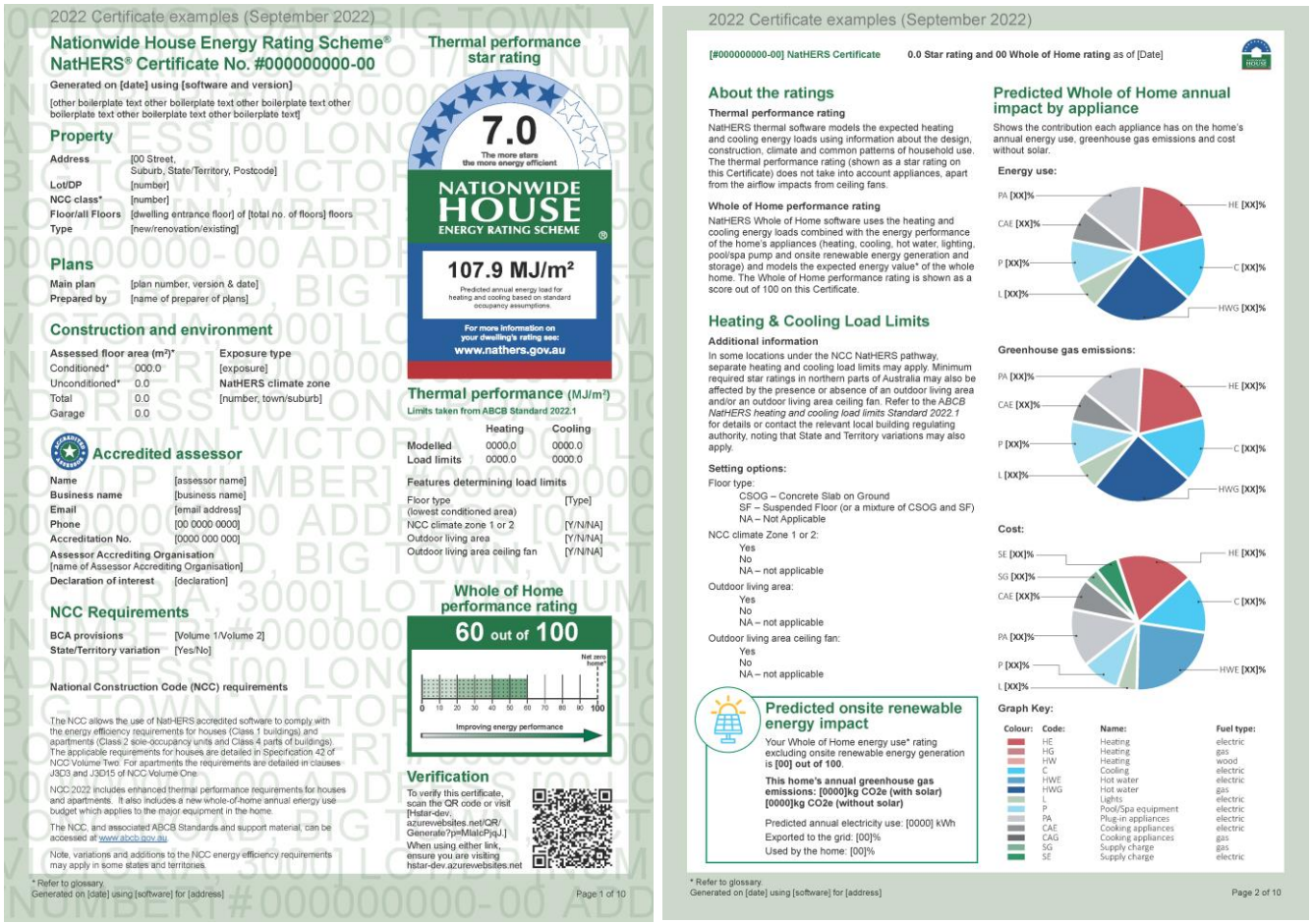
3 Whole of Home NatHERS certificate

The updated NatHERS certificate with the Whole of Home assessment includes details of the property, Whole of Home performance rating, heating and cooling load limits, and appliance impact (the first 2 pages of the certificate are shown in **Figure 2**).

The other pages will include a checklist, schedules of selections used in both the thermal and Whole of Home assessments, explanatory notes and a glossary.

A guide to the new certificate is available on the NatHERS website.

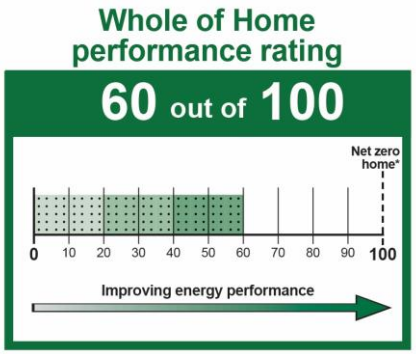
Figure 2: NatHERS certificate with Whole of Home assessment



Whole of Home performance rating scale

The Whole of Home performance rating scale (**Figure 3**) is designed to clearly describe the compliance value (shown as 60 out of 100) at the top of the box, with a bar scale to represent how high the home has scored and how close it is to being a net zero home. A net zero home is a home that achieves a net zero energy value (see Section 1.1 for an explanation of energy value). This correlates to a Whole of Home score of 100.

Figure 3: Whole of Home performance rating



The Whole of Home name and rating scale are trade marks of NatHERS and their use is subject to the requirements of the NatHERS Trade Mark Guidelines.

4 How to improve a rating and when to re-simulate

4.1 Tips to improve a rating

A Whole of Home assessment may need to be iterative to investigate different specification combinations to improve energy performance. This means making adjustments to inputs before a rating is finalised and a certificate issued.

Below are a number of options to trial as a means of improving a rating. The list is not exhaustive and as you become familiar with Whole of Home assessments you will likely develop your own list of optimisations.

- Improve the thermal rating of the project. This will reduce the overall need for heating and/or cooling which in turn improves the Whole of Home rating.
- Select higher efficiency appliances and size appropriately.
- Change appliance type e.g. change ducted air conditioning to room reverse cycle air conditioning which is generally considered more efficient as there are no losses associated with the ducts and the systems can be more accurately sized for individual zones.
- Switch between fuel technologies e.g. from a gas instantaneous hot water heater to a solar electric hot water heater.
- Install load shifting technologies to reduce energy demand during peak hours e.g. install a battery, orient some PV panels to the west to generate energy during the afternoon and evening peaks, run a heat pump hot water system off-peak (depending on solar PV this may or may not be advantageous).
- Add onsite renewable energy (PV).
- Speak to the client about reducing the size of the home as many of the Whole of Home calculations are based on floor area (m^2).

4.2 When to re-simulate the NatHERS Whole of Home assessment

As with NatHERS thermal assessments, if project specifications change, the Whole of Home assessment must be revised. Examples of revisions which require a re-rating and a new certificate issued, include:

- an updated NatHERS thermal assessment
- a change in the technology type for any of the appliance categories, e.g.:
    - room reverse cycle air conditioner replaced with ducted reverse cycle air conditioner
    - gas instantaneous hot water heater replaced with gas storage
    - gas cooking appliance is replaced with electric cooking appliance
    - lithium-ion battery is replaced with lead-acid battery
    - variable pool pump replaced with single speed pool pump
- a reduction in appliance efficiency, e.g.:
    - 6-star gas heater replaced with 5-star gas heater

Note that if an appliance or technology is replaced by a higher-efficiency version of the same technology (e.g. a 6-star hot water system replaces a 5-star hot water system), it is not necessary to re-simulate the assessment but you may achieve a better rating if you do.

- STC change for solar hot water and heat pump
  Decreased hot water system small-scale technology certificates (STC) – specifically if the STC value is below the substitution range noted in the certificate.
  Note that the number of STCs associated with a solar water heater is not necessarily a measure of efficiency. Higher STCs can indicate that the system is more efficient, or that the system is larger than the original specifications.
- a reduced PV system size and/or change in orientation and slope
- an increased pool or spa volume.