

Department of Climate Change, Energy, the Environment and Water
GPO Box 3090
Canberra ACT 2601

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To whom it may concern,

Climateworks Centre submission on the expansion of the Nationwide House Energy Rating Scheme to existing homes

Climateworks Centre welcomes the opportunity to respond to the Department of Climate Change, Energy, the Environment and Water's (DCCEEW) consultation on expanding the Nationwide House Energy Rating Scheme (NatHERS) to existing homes. Climateworks bridges the gap between research and climate action, operating as an independent not-for-profit within Monash University. Climateworks develops specialist knowledge to accelerate emissions reduction, in line with the global 1.5 degrees Celsius temperature goal, across Australia, Southeast Asia and the Pacific. This is especially urgent given the window to keep global warming within 1.5 degrees is still open, but narrowing.

Climateworks Centre decarbonisation scenarios 2023 shows that – under least-cost scenarios in line with limiting global warming to both well-below-2°C and 1.5°C – the housing sector's energy efficiency increases by 41 per cent by 2050, compared to today's levels (Climateworks Centre 2023a). Improving the way existing homes use energy can have significant benefits. More energy-efficient homes would significantly reduce the load on the energy system, reducing the need for new energy infrastructure to meet peak demand and aid the transition to net zero (DCCEEW 2024). Efficient homes can also help keep occupants healthier and more comfortable, reducing healthcare system costs (Sustainability Victoria 2022).

Context

A robust national scheme for home energy ratings, implemented in all states and territories, is an important step towards decarbonising Australia's residential building sector. Climateworks supports expanding the NatHERS to existing homes to help incentivise cost-effective energy performance upgrades (Climateworks Centre 2023b).

The expansion would ideally work in conjunction with a suite of policies that can help make Australian homes 'climate-ready' as well as more comfortable for occupants. This suite of policies includes:

- a home energy ratings disclosure framework
- minimum energy efficiency standards for rentals and appliances
- ongoing energy efficiency updates to the NCC in line with the Trajectory for Low Energy Buildings
- state and territory plans to phase out gas use in residential buildings
- one-stop-shops to provide clear information on energy performance upgrades and how to access qualified tradespeople
- workforce training and targeted financial support.

Evidence from the Climateworks' Renovation Pathways program underpins our responses

The program has demonstrated the economic benefits and emissions reduction impacts of thermal upgrade packages coupled with and switching gas appliances to electric equivalents (Climateworks Centre 2023b). Across all dwelling types assessed in Renovation Pathways, thermal upgrades paired with electrification of gas hot water and cooktops can reduce annual carbon emissions by between 1.09 and 2.52 tCO₂e per dwelling. These upgrades can also save between \$1,033 and \$2,195 annually on energy bills, based on 2023 gas and electricity prices. There is an opportunity to support the uptake of these upgrade packages through the expansion of NatHERS.

Submission summary

Climateworks recommends:

- implementing the proposed NatHERS expansion to existing homes as rapidly as is practical, as it is key to making Australia's existing housing stock more efficient
- consulting with all levels of government to ensure aligned expectations/support for all jurisdictions to adopt the scheme for all homes
- embedding a 'zero carbon home' definition within the NatHERS rating system and upgrade guidance. Climateworks has a comprehensive definition that can be used.
- including both thermal ratings and whole-of-home ratings in the NatHERS certificate design
- distinguishing between the use of gas and electric appliances in the Whole of Home rating and upgrade advice
- including a full suite of home upgrade options as part of guidance provided by assessors or on the certificate itself, based on robust analysis of home energy performance such as Climateworks' Renovation Pathways.

Implementing the NatHERS expansion

Recommendation 1: Implement the proposed NatHERS expansion to existing homes as rapidly as is practical, as it is key to making Australia's existing housing stock more efficient.

Climateworks welcomes DCCEEW's expansion of NatHERS to cover existing homes across Australia. A broadly applicable national approach to home energy ratings and assessments is a key tool to decarbonise Australia's residential building sector.

Introducing the rating scheme, assessments and subsequent upgrade guidance could raise awareness of the importance of good home energy performance (through thermal shell and electrification) and inform decision-making by homeowners, financial institutions and governments to ensure renovations are effective. It would be an important step towards making existing Australian homes 'climate-ready', enabling a faster rollout of appliance and thermal upgrades, better data access and greater interface with financial institutions and green financing products.

The impact of expanding NatHERS would be amplified if it is implemented quickly, and we recommend this takes place as soon as it is practical. There are an estimated 10.9 million dwellings in Australia according to the Australian Bureau of Statistics (2022). Many of these were built before the National Construction Code (NCC) had energy efficiency requirements. Implementation of the NatHERS expansion as well as the Home Energy Ratings Disclosure Framework would have a significant decarbonisation impact on Australia's housing stock. Detached houses represent 71 per cent of Australia's housing stock overall (Climateworks Centre 2023b) and could be targeted first for applying NatHERS including homes with high energy consumption, social and community housing and the worst-performing homes. Rapid expansion of NatHERS would support the implementation of mandatory disclosure of home energy ratings through the Home Energy Ratings Disclosure Framework, which Climateworks recommends be implemented for early adopter states and territories by the end of 2024 and all states and territories in 2025.

Recommendation 2: Consult with all levels of government to ensure aligned expectations/support for all jurisdictions to adopt the scheme for all homes.

Expanding NatHERS to existing homes will provide a single, national scheme to better cohere and incentivise improvements to home energy performance to support all households. Ongoing consultation and management across all levels of government is important to ensure that it is adopted and implemented by as many jurisdictions as possible. A single, shared scheme would particularly benefit state and territory governments, simplifying the range of tools to evaluate home energy efficiency. The federal government could act to ensure all jurisdictions can adopt the scheme for all homes, including by helping align expectations and consider geography-specific issues. A timeline that sets out national adoption of a single rating scheme will help to provide clarity about the implementation and expectations of state and territory adoption. With enough coverage and mandatory disclosure of both the NatHERS star rating and score, Australia could catalyse a self-sustaining renovation wave for homes nationwide.

The scope and scale of a single national scheme require a considered delivery model. The proposed delivery model (Chapter 5) requiring assessors to physically enter homes, collect data and then generate a 'Home Energy Rating Certificate' is a departure from the primarily desk-top based existing NatHERS model that does not require a physical assessment. The introduction of a different model is understandable given the considerably different proposed scope, but tailored adoption of an existing national model for both new and existing homes would be a more efficient use of resources. Alternatives could result in an inefficient patchwork of rating schemes, particularly between jurisdictions, requiring more intensive resources to ensure each assessment approach is fit for purpose and aligns with existing mandatory regulation. Ultimately, this would curtail momentum for more efficient homes.

Embedding a definition for zero carbon homes into the NatHERS rating

Recommendation 3: Embedding a 'zero carbon home' definition within the NatHERS rating system and upgrade guidance. Climateworks has a comprehensive definition that can be used.

Australia's existing housing stock is becoming more efficient, and aiming for zero carbon homes assists the transition to a net zero future. Incorporating a clear definition of a zero carbon home is critical to build coherence between policy-makers, lenders, the construction industry and households (Climateworks Centre 2023c). In particular, it would help homeowners navigate how to reduce the carbon emissions of their homes and empower them to make more informed choices.

Zero carbon buildings produce no net emissions¹ over their entire lifecycle. Decisions made at each stage, from initial construction to renovating and maintenance, can potentially reduce energy demand and carbon emissions. Zero carbon buildings can be achieved by combining multiple interventions, which each reduce energy, from efficient all-electric appliances to low or no energy technologies such as insulation, gap seals, or window shading. With many ways to improve a home, clear guidance can help households prioritise zero carbon solutions that most efficiently reduce energy use.

We recommend that the NatHERS embed Climateworks' definition of a zero carbon home in both the rating tools and the subsequent upgrade guidance to ensure that both align with a transition to a net zero carbon pathway (Climateworks Centre 2023c).

Climateworks defines a zero carbon home with six criteria:

- **Planning and design decisions** for location, construction, future maintenance and renovations to maximise a building's longevity and long-term safety for occupants, including prioritising resilience.
- **Form** (i.e. building's orientation to the sun, overall shape, and arrangement of internal rooms) designed to suit local climate temperatures and harness renewable energy, sized to be an efficient use of space and materials, and able to be maintained safely.

¹ In this context, 'net emissions' refers to the total amount of emissions averaged over the lifecycle of the building, it does not refer to the use of carbon offsets.

- **Thermal shell** (i.e. external walls, ground floor and roof) designed, constructed and upgraded using a fabric-first approach to reduce the amount of energy needed to heat, cool and operate the building, therefore reducing the size of appliances needed to maintain safe indoor temperatures and air quality.
- **Materials** (i.e. all components used in a building plus its external spaces and structures on site) have low overall embodied energy and carbon emissions calculated over their lifecycle, or are reclaimed materials, and are durable.
- **Electrified appliances and services** (i.e. fixed appliances) which are fully powered by renewable energy generated/stored on site or purchased from a renewable energy source and optimised for a renewable energy grid (i.e. minimise energy demand, enable variable renewable generation operable at times of peak solar generation).
- **Operation** (i.e. control of building's features and fixed appliances) is simple and user-friendly on a day-to-day basis and for maintenance or repair by occupants, tradespeople or building managers.

The definition sets out what the emissions goal should be for all homes. A strong goal can help inform what emissions-reducing renovations to consider for owner-occupiers, or housing providers and investor landlords who may be upgrading a portfolio of many homes. The definition can also guide finance lenders as to what upgrades are best included in homeowner's finance applications and to assess the upgrades included as to their impact on the climate risk of their lending portfolio and whether they meet green investment criteria.

Inclusions for ratings and certificates

Recommendation 4: Include both thermal ratings and whole-of-home ratings in the NatHERS certificate design.

Recommendation 5: Distinguish between the use of gas and electric appliances in the Whole of Home rating and upgrade advice.

Assessing home energy performance is the critical first step to decarbonising existing homes. We welcome the commitment in the consultation paper to a two-rating system for both a 'Whole of Home energy performance' rating and a 'thermal performance' rating (Page 20 of consultation).

Our analysis shows the importance of a home's thermal shell for energy performance. Homes with high-performing thermal shells see substantially reduced energy use and emissions. The national average for 'climate-ready' homes is 10.3 MWh and 1.9 tCO₂e less per household annually than 'low-performing' homes². Thermal upgrades would also positively impact the energy transition by reducing peak demand and easing pressure on the grid. Disclosing the NatHERS thermal rating alongside the NatHERS Whole of Home rating would be key for consumers to understand the importance of a home's thermal shell and to incentivise thermal upgrade improvements.

Climateworks supports including the Whole of Home rating in the expanded NatHERS and related consideration of appliance energy use. Although this is a positive start, we recommend including a further distinction between the use of gas and electric appliances. Electric appliances can have many benefits, including greater energy savings, reduced emissions and better health outcomes. Climateworks' research shows that electrifying cooktops and hot water systems can reduce annual energy consumption by 3.4 MWh and annual emissions by 0.61 tCO₂e per dwelling nationally when considering single dwellings and apartments (Climateworks Centre 2023b). There is the opportunity to drive further electrification through additional information and assessment through ratings, certificates and upgrade guidance. For example, a rating could highlight the gas appliances in the building; assessors could provide upgrade guidance on replacing gas appliances with electric appliances and could provide an estimate of when appliances are expected to reach the end of their life.

² 'Climate-ready' homes are modelled in Climateworks' research with insulation in ceiling, floors and walls, sealed draughts and shaded and double-glazed windows. 'Low-performing' homes are modelled with minimal insulation, unsealed draughts and gas heating.

We suggest that both the 'Whole of Home energy performance' rating and a 'thermal performance rating' be reflected in the final design of a NatHERS certificate. We also recommend illustrative distinction between gas and electric appliances be included in addition to the text. Where possible, 'years to likely replacement' should be included for each type of appliance. We advise that the NatHERS certificate adopts aspects of other rating tools such as the Residential Efficiency Scorecard (RES), particularly in regards to thermal ratings (referred to as 'hot and cold comfort ratings' in the RES) and relative improvement options.

Providing upgrade guidance to homeowners

Recommendation 6: Include a full suite of home upgrade options as part of guidance provided by assessors or on the certificate itself, based on robust analysis of home energy performance such as Climateworks' Renovation Pathways.

Providing homeowners with energy performance data is an opportunity to inform them of potential upgrades, especially relating to thermal shell and appliances. We advise including a full suite of upgrade options, including thermal upgrades, electrification of hot water and cooking appliances, and rooftop solar for the remaining energy use, when this guidance is provided as part of NatHERs, ideally as part of the certificate itself. Climateworks' Renovation Pathways analysis packages this into three upgrade bundles (Figure 1), which could form the basis of upgrade guidance to existing homeowners.

Figure 1: Full suite of packages applied to low-performing homes in Climateworks' Renovation Pathways modelling, including thermal upgrades, electrification of hot water and cooking appliances, and rooftop solar for the remaining energy use.

	ENERGY PERFORMANCE UPGRADE BUNDLES		ELECTRIFICATION	ROOFTOP SOLAR
Quick-fix	Insulation	Ceiling R3.0	Efficient electric hot water heating and cooking	Maximum roof area for solar required to match level of electricity use
	Infiltration/ draughts (walls, floor, ceiling)	0.5 ACH		
	Curtains	Heavy drapes		
	Window shades	Roller shutters		
	Thermal appliance – heating & cooling	Efficient electric heat pump		
Modest	Insulation	Ceiling R3.0, Floor R2.0	Efficient electric hot water heating and cooking	Medium roof area for solar required
	Infiltration/ draughts (walls, floor, ceiling)	0.5 ACH		
	Curtains	Heavy drapes		
	Window shade	Roller shutters		
	Window system	Additional layer of glass or film		
Thermal appliance – heating & cooling	Efficient electric heat pump			
Climate-ready	Insulation	Ceiling R3.0, Floor R2.0, Wall R2.0	Efficient electric hot water heating and cooking	Minimum roof area for solar required
	Infiltration/ draughts (walls, floor, ceiling)	0.2 ACH		
	Curtain	Heavy drapes		
	Window shades	Roller shutters		
	Window system	Efficient double glazing		
Thermal appliances – heating & cooling and heat recovery ventilation (HRV)	Efficient electric heat pump with HRV Efficient 85% heat recovery			

Thank you for taking the time to consider our submission. We would welcome an opportunity to brief your team if you would like to explore our responses in further detail.

Yours sincerely,

Dr. Gill Armstrong

Program Impact Manager - Buildings,
Climateworks Centre
gill.armstrong@climateworkscentre.org

Mia Dewar

Project Officer - Buildings,
Climateworks Centre
mia.dewar@climateworkscentre.org

Dr. Jarrod Grainger-Brown

Senior Research Officer - Cities,
Climateworks Centre
jarrod.grainger-brown@climateworkscentre.org

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