Steffen Welsch Architects

Environmental Certification Systems for Homes

Name	issued by	is it relevant for local conditions	what is being issued	what is assessed	What is assessed (Categories/Examples of relevant factors)	Requirements	at what stage is it conducted	cost	how long does certification last	impact on borrowing capacity (construction loans)
Mandatory										
NatHERS (thermal shell (star) rating, and whole of home rating)	Administered by the Department of Climate Change, Energy, the Environment and Water Certificate issued by the energy rater	Yes	• An energy efficiency (star) rating measuring how much heating and cooling is needed to keep house comfortable: higher star rating - more efficient • The predicted annual energy load for heating and cooling	(Predicted) Thermal performance of building fabric	Star rating: • Zoning • Floors • Thermal properties of walls • Window and door orientation, and thermal proprties of glazing system • Ceiling and roof type • Shading • Thermal bridging aligned with NCC requirement Whole of Home • Heating and cooling • hot water • pools and spas • onsite energy production and storage • cooking loads • plug loads And how these factors interact with the local climate	7-star Whole of Home rating: 60	Building permit stage	~$500	No expiry	Commbank Green Home Offer criteria: • **NatHERS rating ≥ 7** • A low Standard Variable Rate loan (6.26% p.a. Standard Variable Rate) Bank Australia Eco (for new energy efficient homes) • **NatHERS rating ≥ 7** • 5.98% p.a. reduced variable rate Bank Australia Eco (for ambitious homes) • **NatHERS rating ≥ 7.5** • Solar panels: At least 3KW in size • 5.88% p.a. reduced variable rate
Built Environment Sustainability Scorecard (BESS)	Depends on the council associated with the project	Yes	A report demonstrating how a proposed development addresses sustainable design	• Management • Water efficiency • Energy efficiency, generation, and emissions • Stormwater treatment • Indoor Environment Quality • Transport: bicycle parking and EV infrastructure • Waste: Reduction and recycling • Urban Ecology: vegetation, food production, green roofs/walls/facades		Mandatory Category Scores: • Water - 50% • Energy - 50% • Stormwater - 100% • Indoor Environment Quality (IEQ) - 50% • 'Best practice': overall score of 50% or higher. • 'Excellence': overall score of 70% or higher.	Planning permit stage	Free	N/A	
Non-mandatory										
Residential Efficiency Scorecard	Administered by Victorian Government Certificate issued by government-accredited assessor	Yes	• Energy efficiency rating and comfort rating (how well home copes with hot and cold weather) • Information on energy consumption and greenhouse gas emissions of fixed appliances • Practical advice for improving the home's energy efficiency	House's (actual) thermal performance and energy efficiency	• Hot water system • Curtains and external blinds • Solar panels • Lighting • Heating and cooling • Air leakage • Ceiling insulation • Showers • Window size and orientation • Floor material and insulation • Wall material and insulation • Pools and outdoor spas	N/A	Post-construction	Between $250 to $500 Depends on home's size, location, and complexity	N/A	Bank Australia Eco (for new energy efficient homes) • **A Residential Efficiency Scorecard rating of 7+ stars (excluding the impact of solar)** • 5.98% p.a. reduced variable rate
Passivhaus Classic	A Passivhaus Institute accredited Building Certifier	Yes	Certificate certifying a building's adherence to the Passivhaus (Classic) criteria	House's (predicted and actual) thermal performance and energy efficiency	• airtightness • thermal insulation • mechanical ventilation heat recovery • window performance • thermal bridge minimisation		A multi-stage process; reviews are conducted during: (1) Schematic design (2) Before construction (3) Post-construction	Upwards of 5-8k (does not include cost of getting a Passivhaus consultant)	No expiry - unless changes are being made to the house	Bank Australia Eco (for new energy efficient homes) • **Passive House certification** • 5.98% p.a. reduced variable rate
Passivhaus Plus	A Passivhaus Institute accredited Building Certifier	Yes	Certificate certifying a building's adherence to the Passivhaus (Plus) criteria	• House's (predicted and actual) thermal performance and energy efficiency • Whether renewable energy generation covers operational energy	+ Renewable energy generation capacity					
Passivhaus Premium	A Passivhaus Institute accredited Building Certifier	Yes	Certificate certifying a building's adherence to the Passivhaus (Premium) criteria	• House's (predicted and actual) thermal performance and energy efficiency • Whether renewable energy generation *exceeds* operational energy	• Airtightness • Renewable Primary Energy (PER) And one of: **Component criteria method:** • Heat transfer coefficient (U-value; units: W/m^2K) of the opaque building envelope against the ground (insulation) and the ambient air (exterior insulation, interior insulation, and exterior paint). (Lower U-value means better insulated.) • Heat transfer coefficient of the windows overall (excluding exterior doors) • Solar heat gain coefficient (g-value) of the glazing • Specific solar load during cooling period • Heat recovery rate (ventilation) • Humidity recovery rate (ventilation) or **Energy demand method** • Maximum heating demand • Maximum cooling + dehumidification demand				
EnerPHit (Retrofit)	A Passivhaus Institute accredited Building Certifier	Yes	Certificate certifying a building's adherence to the Passivhaus (EnerPHit) criteria							
Life Cycle Assesssment (LCA)	ESD consultant	Yes	• House's carbon performance based on local benchmark • Report on input data - highlighting carbon intensive components of house, and source of carbon savings	House's carbon footprint across its entire lifecycle	Carbon emissions associated with house's construction, operation, and deconstruction		Typically: (1) concept design and/or (2) design development and/or (3) post-construction	$1200-$3000 Depends on number of assessments conducted	N/A (report's estimates stay 'valid' for as long as the design remains unchanged)	
Living Building Challenge	International Living Future Institute	Yes	Certificate certifying a building's adherence to the Living Building Challenge standards	The building's positive impact on the community and the environment	• Positive impacts on the site context • Responsible and efficient water use • Carbon reduction and renewable energy generation • Health and happiness • The responsible sourcing and usage of healthy, sustainable materials • Equity and inclusion considerations • Beauty		Post-construction	Upwards of 18k	3 years	
Green Star Homes	Green Building Council of Autralia	Yes (but it's targeted towards volume home builders)	A certificate	• Thermal performance, • air quality, moisture management, • light quality • material toxicity • water efficiency • climate change readiness						
Supplementary Schemes										
Environmental Product Declarations (EPD Australasia)	EPD Australasia	Yes	a verified and registered data sheet on a product's environmental impac	the product's contributions to climate change (carbon footprint), air, water and soil pollution and resource depletion						
Good Environmental Choice Australia (GECA) Ecolabel	Good Environmental Choice Australia	Yes	certification that product has a lower impact on the environment and human health, are ethically made and fit for purpose	A product's environmental and social impact	Considers: toxicity, air quality, energy use, recyclability, VOCs, carcinogens, reducing water consumption, protecting waterways, use of sustainable materials and minimising material usage					
FSC										
PEFC										

potential impact on behaviour/living experience	Impact on construction cost	potential impact on operating cost	show me the sample	
Thermal comfort with minimal reliance on mechanical heating and cooling	Constructing an energy efficient home: potentially higher *upfront* cost compared to a non energy-efficient home	Lower energy bills	https://www.dropbox.com/scl/fi/v6nrk9tm23fd89rmcvq9o/NatHERS-Certificate-Sample.pdf?rlkey=mji5ahdiqffbjhx2oukvf5082&dl=0	For the average 4-person household, the savings from using energy-efficient appliances can be as much as $22,750 over the 25-year appliance life span. Annually, the switch to energy-efficient appliances can result in energy bill cost savings of $910 (all electric home) per year - assuming that energy prices remain the same. (2021)
	Higher upfront costs, but long-term savings	Lower energy bills	https://www.dropbox.com/scl/fi/imqby4zimt06lf39l7l2z6/BESS-Report-Sample.pdf?rlkey=rzt1lci3plf75m4y25laoallrs&dl=0	
Thermal comfort with minimal reliance on mechanical heating and cooling May incentivise purchase of more energy efficient appliances	No impact on initial construction cost (is additional); aim for a higher rating - higher cost, but likely long-term savings	Lower subsequent energy bills	https://www.homescorecard.gov.au/about-scorecard/the-scorecard-certificate	
Thermal comfort with minimal reliance on mechanical heating and cooling	Higher upfront costs, but long-term savings	Lower energy bills		
May encourage: • Pursuit of greater carbon savings and carbon neutrality/positive design • Designing for a greater renewable energy generation capacity	Higher upfront costs, but long-term savings	Use of durable materials to minimise carbon emissions may result in fewer maintenance jobs during building lifetime	https://www.dropbox.com/scl/fi/rpqu3q9qh4jij0nw6mf8s/Lifecycle-Assessment-Sample.pdf?rlkey=qqziokq2in5qnch28tu5ha076&dl=0	
Better connection to community and nature	Higher upfront costs, but long-term savings	Lower energy bills		