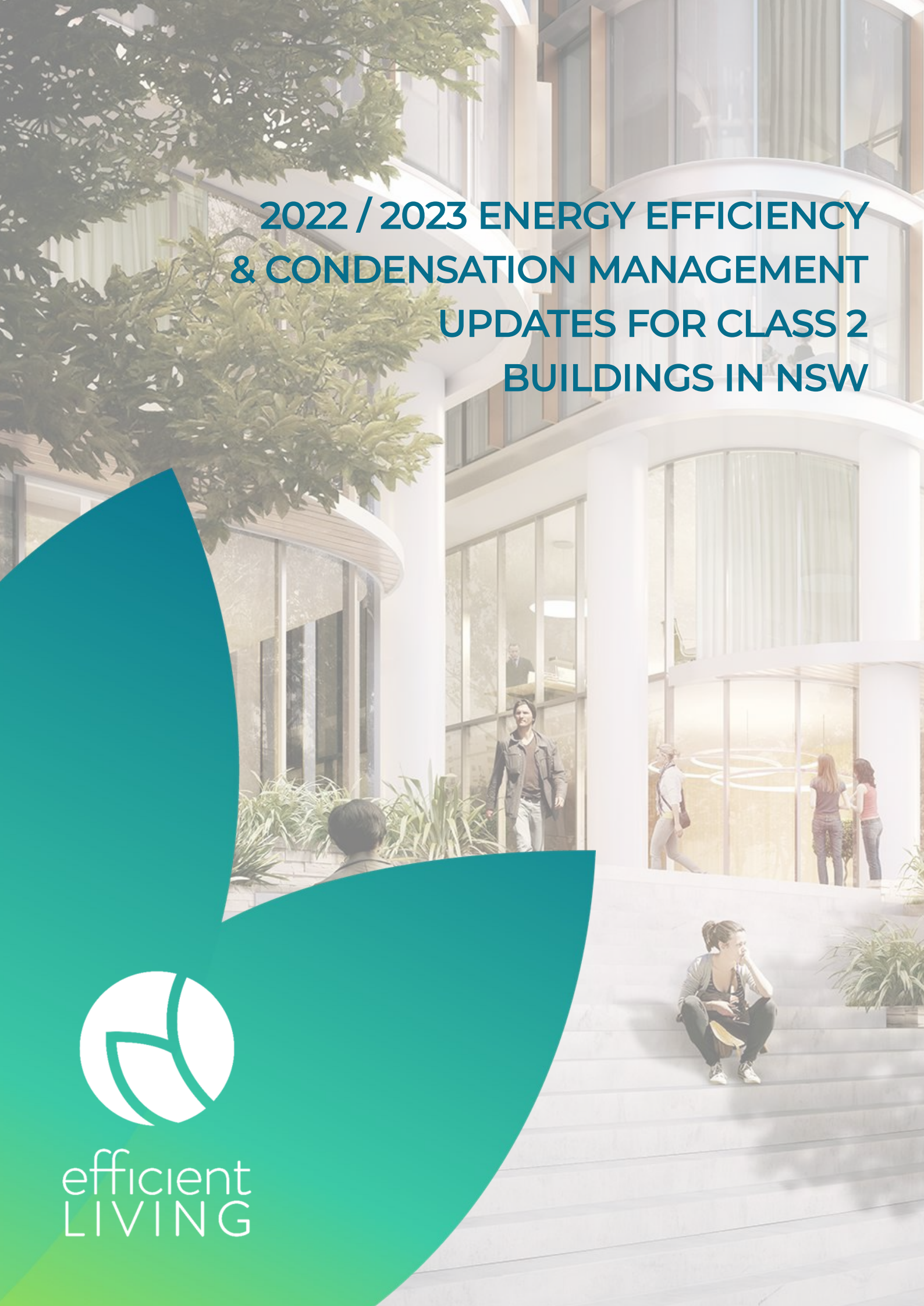

2022 / 2023 ENERGY EFFICIENCY & CONDENSATION MANAGEMENT UPDATES FOR CLASS 2 BUILDINGS IN NSW

efficient LIVING

Key Date

From 1st October 2023

- The new 2022 NCC energy efficiency and condensation management provisions apply to CC or CDC applications submitted on or after this date, except as modified by BASIX.

- NatHERS 7-star thermal performance minimum will apply.

- The new BASIX requirements and tools will apply to development applications (DA or CDC) submitted on or after this date. New BASIX calculations apply to energy calculations. No change is applied to water calculations.

2022 NCC updates

Section J Energy Efficiency

Performance Requirements

Performance Requirement		Applies to individual apartments	Applies to apartment buildings
J1P1	Energy usage Amended to clarify requirements for a Class 2 building or a Class 4 part of a building *does not apply to Class 2 or Class 4 in NSW	No	**Yes**
J1P2	Thermal performance of a Class 2 SOU A new Performance Requirement for the thermal performance of Class 2 SOU's	**Yes**	No
J1P3	Energy usage of a Class 2 SOU A new Performance Requirement for the energy usage of Class 2 SOU's	**Yes**	No
J1P4	Renewable energy and electric vehicle charging A new Performance Requirement for renewable energy and electric vehicle charging equipment	No	**Yes**

J1V1 NABERS Energy [Revised verification methods to include Class 2]

J1V1 has been extended to include Class 2 buildings other than sole-occupancy units (ie. Common areas). It is recommended to commence the Section J assessment at DA stage to avoid façade variations arising at CC.

*NSW Variation does not include Class 2

J1V4 Building envelope sealing [Revised verification methods to include minimum air flow rate]

Well-sealed buildings with poor ventilation can have increased condensation and health risks. However, buildings that are both well-sealed and adequately ventilated can be very effective at managing condensation. The verification method now includes quantified targets for allowable air flow rates inside apartments. After construction a "blower door test" can be commissioned to determine the number of air changes / hour in the apartments. An apartment can have:

- No more than $10m^3/hr/m^2$ air flow rate and
- No less than $5m^3/hr/m^2$ air flow rate, otherwise a mechanical ventilation system is required to be installed

J3D3 Reducing heating and cooling loads [Revised DTS to increase star rating requirements]

Higher minimum energy efficiency rating under NatHERS of:

- An average of at least 7 stars with average heating and cooling caps collectively across the building and
- A minimum of 6 stars with maximum heating and cooling caps in each individual apartment

*In NSW this is assessed under BASIX.

J9D4 Facilities for electric vehicle (EV) charging equipment [New DTS]

- Dedicated distribution boards for EVs on each level – equipped with charging control/active load management systems
- Be sized to support future 7kW (32Amp) type 2 chargers for 100% of parking spaces associated with a Class 2 building

J9D5 Facilities for solar photovoltaic and battery systems [New DTS]

- Main switchboard to provide for solar PV system and battery system
- Minimum of 20% of roof area left clear for installation of PV array, except for:
    - Buildings with existing PV arrays of at least 20% or equivalent generation elsewhere on site
    - Where 100% of the roof area is shaded for more than 70% of daylight hours
    - Where roof area < 55m^2
    - Where 50% or more of the roof area is used for a community terrace, roof garden, car park, roof light or similar

Part F8 Condensation Management

F8V1 Condensation management [Revised verification methods]

A new verification method using the AIRAH Mould Index calculation method that specialists can use to assess condensation risk in a building. The verification method now includes quantified targets for allowable condensation risk. A Mould Index of 3 (a measure of mould growth potential) must not be exceeded.

F8D3 External wall construction [Revised DTS]

Some materials used in walls can inadvertently trap moisture. To reduce this risk, the DTS Provisions are updated to require additional vapour permeance of some wall materials, such as building wrap or secondary insulation, depending on climate zone.

- Minimum levels of vapour permeance are set out for external walls to climate zones 4-8 (most of NSW). Higher requirement for zones 6, 7, 8 compared to 4, 5.

F8D4 Exhaust systems [Revised DTS]

The DTS Provisions for exhaust systems include several new requirements:

- Kitchen, bathroom and laundry exhaust systems must be discharged to the outside of a building (e.g. instead of discharging into a roof space).
- Exhaust systems installed in bathrooms or sanitary compartments, which don't have sufficient access to outdoor air (e.g. via windows), must be controlled to turn on when the lights in the room are turned on. They are also required to continue to operate for 10 minutes after the lights are turned off.
- Exhaust systems installed in bathrooms or sanitary compartments that don't have sufficient access to outdoor air must be provided with make-up air from an adjacent room, like having an undercut to a separating door.
- Relaxed laundry exhausting requirements when condenser dryers are installed.

F8D5 Ventilation of roof spaces [Revised DTS]

Roof spaces, particularly in cool climates, are often at increased risks from condensation. NCC 2022 requires roof spaces in climate zones 6, 7 and 8 to be provided with ventilation openings

Concrete roofs and roof spaces in bushfire flame zones (BAL-FZ in AS 3959:2018) are not required to be provided with ventilation openings under the provisions.

NatHERS updates

Whole of Home rating – no minimum rating in NSW / does not apply in NSW as BASIX is used

Until now, NatHERS has focused on assessing the building shell, meaning all the construction materials (including walls, insulation, windows, and roofs) that are used to build a house. This 'thermal performance' assessment gives a star rating out of 10 based on how much heating and cooling energy is needed to keep a home comfortable.

From 1 September 2022, NatHERS can assess and rate energy use for the whole home including the major appliances (heating and cooling systems, hot water heaters, lighting, pool pumps and spas) and solar panels and batteries.

The rating considers energy used for heating and cooling, and appliances, minus energy generated from solar panels. This 'Whole of Home' assessment gives a second performance rating out of 100, where 100 is a net zero energy value home. Ratings above 100 are possible. One way a home may rate over 100 is where it generates more energy than it uses.

The new certificate will display a thermal comfort star rating out of 10 and an energy rating out of 100.

Thermal bridging for metal frames

Insulation losses will be built into the NatHERS modelling tools. It is expected to reduce the thermal performance of a single dwelling by up to 1 star.

Sustainable Buildings SEPP / BASIX energy calculation updates

Higher thermal performance standards to limit the amount of heating and cooling required. BASIX thermal performance and energy standards have increased for all new residential buildings across NSW except for:

- homes in NatHERS Climate zones 9, 10 and 11 on the north coast of NSW
- low and mid-rise apartment buildings up to 5 storeys in NSW

Higher energy standards

Two new separate energy standards are proposed for high rise apartment buildings:

- 6 – 20 storeys and
- 21 storeys and higher

This will account for the energy consumption of shared services specified in high-rise buildings.

Updated greenhouse gas emissions factor of grid electricity

The NSW electricity grid has become greener as we produce more electricity from renewable energy sources. The greenhouse emissions factor of grid electricity will be updated from 1.062 kg CO2-e/kWh to 0.67 kg CO2-e/kWh.

Lighting and appliances

Lighting and appliances updates include:

- Assumed installation of energy efficient lighting.
- Updating the default efficiency settings of household appliances. E.g. fridges.
- Removing star rating selections of fridges and washing machines in apartment units to reduce waste if occupants move into new apartment units with their own fridge and washing machine.
- Users can continue to select star ratings of dishwashers and clothes dryers.

Building services

- Lift inputs and calculations will be revised to include lift banks and express zones
- Tempered air supply will be an available option for the ventilation of lift lobbies and corridors
- Energy consumption from central heat pump hot water systems with gas boosters will be revised.

BASIX Materials Index [new from October 2023]

The BASIX Materials index is being introduced to calculate the embodied emissions of a development. The calculator will provide emission factors based on the materials selected and estimated quantity. Note:

- Calculations in the new BASIX tool will require detailed material selections and areas of floors, external walls, internal walls and glazing.
- There will be no limit on embodied emissions of building materials when the policy commences on 1 October 2023. Once comprehensive data has been collected, a standard will be developed.

Proposed Thermal Loads and BASIX Energy targets for Sydney

Maximum allowable thermal loads: average of all dwellings (MJ/m²/year)

Climate Zone 56 (East Sydney)	Current			Proposed (1 October 2023)		
	Heating Load	Cooling Load	Total Load	Heating Load	Cooling Load	Total Load
Multi residential (up to 5 storeys)	40.0	26.0	-	29.7	21.2	-
Multi residential (6 storeys and higher)	40.0	26.0	-	28.1	20.0	30.0

Climate Zone 17 (Sydney CBD)	Current			Proposed (1 October 2023)		
	Heating Load	Cooling Load	Total Load	Heating Load	Cooling Load	Total Load
Multi residential (up to 5 storeys)	25.0	28.2	-	31.0	19.8	-
Multi residential (6 storeys and higher)	25.0	28.2	-	29.1	18.6	30.0

Climate Zone 28 (West Sydney)	Current			Proposed (1 October 2023)		
	Heating Load	Cooling Load	Total Load	Heating Load	Cooling Load	Total Load
Multi residential (up to 5 storeys)	55.8	56.2	-	63.6	49.3	-
Multi residential (6 storeys and higher)	55.8	56.2	-	58.0	45.0	60.0

BASIX energy targets

Building height	Current	Proposed (1 October 2023)		
		Climate Zone 56 (Greater Sydney)	Climate Zone 17 (Sydney CBD)	Climate Zone 28 (West Sydney)
Multi residential (up to 3 storeys)	45	67	67	62
Multi residential (4-5 storeys)	35	61	62	57
Multi residential (6-20 storeys)	25	60	60	58
Multi residential (20 storeys and higher)	25	63	63	61

Efficient Living's top tips to achieve the increased thermal comfort and energy targets

Design for place by considering building orientation and siting which will reduce heating and cooling loads.

To reduce heating load:

- locate to the north: private open spaces, living areas, thermal mass and windows

To reduce cooling load:

- locate to the south, east and west: laundries and bathrooms, and reduce windows in these orientations.
- provide eaves / horizontal shading devices to north facing windows to block summer sun
- provide more and larger openable windows. Consider different sash types or fall-prevention screens
- include ceiling fans to living areas and bedrooms
- use lighter colours for the external roof and wall colours. Lighter colours for window frames can also improve ratings

Improve glazing design via window size reductions, window placement, external shading structures, thermally broken aluminium framing

Improve insulation:

- Increase the R-value of insulation in walls, floors and ceilings – noting that higher R-value insulations are thicker; so larger wall cavities and ceiling cavities may need to be considered
- Reduce ceiling insulation losses – specify IC-4 rated downlights which allow insulation over, delete or reduce the size of roof windows and skylights to allow for more continuous ceiling insultation

More thermal mass in walling systems vs light weight wall systems

Upgrade to heat pump / condenser 8-star dryers. These have the added bonus of not requiring mechanical ventilation under 2022 NCC and reduce risk of mould compared to traditional dryers. Note: these dryers cannot be wall-hung, so laundry designs should accommodate:

- width for side-by-side washer & dryer or
- supply of separate stacked washer & condenser dryer machines

Plan for all-electric and all renewable buildings by specifying:

- induction cooktops instead of gas
- centralised hot water – electric heat pump instead of gas fired boiler or gas instantaneous
- pool and spa heating – electric heat pump instead of gas
- larger areas for solar PV array installations
- suitably sized main switchboard and substations to support future solar PV systems, battery systems and electric vehicle charging to 100% of car spaces. Also consider peak and off-peak load management, metering & apartment charge control equipment to manage EV's.

Sustainable Building Consultants
p. 02 9970 6181 **e.** admin@efficientliving.com.au
www.efficientliving.com.au