

NCC - BCA VOLUME ONE:ENERGY EFFICIENCY PROVISIONS

INTRODUCTION

This TECHnote includes information useful in satisfying the NCC (2022) Energy efficiency provisions for Class 2 to 9 buildings. The NCC objective is to reduce energy consumption and energy peak demand, reduce greenhouse gas emissions and improve occupant health and amenity. Operational energy is currently the focus of the NCC. Embodied energy may be considered in the future for sustainability controls.

PERFORMANCE REQUIREMENTS

J1P1 Energy Use: Mandates the provision of building and services features that facilitate the efficient use of energy as appropriate to a number of considerations, including building function and use, human comfort, solar radiation, energy source, sealing of the envelope and energy consumption limits for conditioned spaces.

J1P2 Thermal performance of a sole occupancy unit of a Class 2 building or a Class 4 part of a building: The maximum heating load, cooling load and thermal energy load are mandated by Specification 44.

J1P3 Energy usage of a sole occupancy unit of a Class 2 building or a Class 4 part of a building: Sets limits for the energy value for heating, cooling, hot water and lighting, and considering factors including geographical location of the building, the energy source and the location of the domestic service.

J1P4 Renewable energy and electric vehicle charging: Requires future-proofing for on-site energy generation and storage and electric vehicle charging.

DEEMED-TO-SATISFY PROVISIONS The *Deemed-to-Satisfy* provisions may vary depending on the *Climate zone* of the building.

Part J2 Energy efficiency

Provisions clarify the application of Section J. Sole-occupancy units of Class 2 and 4 must achieve minimum star energy ratings calculated using software accredited under the Nationwide House Energy Rating Scheme (NatHERS) and load limits in the ABCB standard *NatHERS Heating and Cooling Load Limits*. The minimum requirements for ceiling fans, roof thermal breaks and wall thermal breaks are also set.

Part J3 Elemental provisions for a sole occupancy unit of a Class 2 building or Class 4 part of a building

Contains Deemed-to-Satisfy provisions for compliance with part J1, including insulation requirements and energy efficiency of services.

Part J4 Building fabric

Provisions contain requirements for thermal construction covering the use of both bulk and reflective insulation, required Total R-Values and Total System U-Values, and deem roof, ceiling, wall and floor materials to have thermal properties (listed in BCA Specification 36). Roof and ceiling construction, roof lights, walls and glazing, and floors are also covered. A facade calculator is available on the ABCB website to aid users.

Part J5 Building sealing

Provisions relate to the control of unwanted air movement through the building envelope. It addresses chimneys and flues, roof lights, windows and doors, exhaust fans, construction of ceilings, walls and floors, and evaporative coolers. The building sealing requirements vary depending on the climate zone and location.

Part J6 Air-conditioning and ventilation systems

Provisions include:

- Requirements for the energy efficient control of air conditioning systems including the provision of outside air economy cycles and the ability to operate the air-conditioning, ventilation or exhaust systems in only part of a building when needed.
- Control of carpark exhaust by atmospheric contaminant monitoring.
- Insulation on heating and cooling ductwork and piping and sealing of ductwork.
- Setting minimum energy efficiency for boilers, chillers and package air conditioning plant.
- Minimum energy efficiency for heat rejection equipment fans.

Part J7 Artificial lighting and power

Provisions include:

- Manual and automatic control of internal and external lighting.
- Maximum lighting power loads based on different room functions, and with concessions allowed where rooms are small or where there are lighting control devices.
- Time switch control of boiling water and chilled water storage units.
- Energy performance levels and efficiency class for lifts.
- Ability for escalators and moving walkways to slow when unused.

A lighting calculator is available on the ABCB website to aid users.

Part J8 Heated water supply and swimming pool and spa pool plant

Provisions relate to the control of loss of heat from heated water systems and storage water heaters that heat and supply water for swimming pools and spas. In general, heated water supply pipes are required to be insulated except for solar heated water supply systems for food preparation and sanitary fixtures in *Climate zones* 1, 2 and 3.

Part J9 Facilities for energy monitoring

Buildings must have facilities to monitor its energy usage.

VERIFICATION METHODS

NCC (2022) offers the following verification methods that satisfy J1P1:

- J1V1 NABERS Energy for Class 2 (other than sole-occupancy units), 3, 5 and 6 (shopping centre) buildings.
- J1V2 Green Star for Class 2 (common areas), 3, 5, 6, 7, 8 or 9 buildings.
- J1V3 Verification using a reference building for Class 2 (common areas), 3, 5, 6, 7, 8 or 9 buildings.
- J1V4 Verification of building envelope sealing for Class 3, 5, 6, 7, 8 or 9, and parts of Class 2 or 4 buildings.
- J1V5 Verification using a reference building for a Class 2 sole-occupancy unit.

Definitions.

Annual energy consumption:

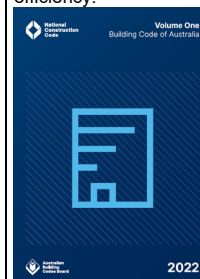
The theoretical amount of energy used annually by the building services, excluding kitchen exhaust and the like.

Energy efficiency: A measure of the reduced energy consumption resulting from design improvements in comparison to the amount of energy that would otherwise have been consumed. It improves the performance of services systems that directly consume energy and the ways that heat flows into and out of the building through its enclosing fabric.

Service: Mechanical, hydraulic and electrical systems that use energy to provide air conditioning, ventilation, hot water supply, artificial lighting etc. For the purposes of the NCC, services do not include systems used solely for emergency purposes, cooking facilities and portable appliances.

NATSPEC

NATSPEC uses the *Deemed-to-Satisfy* provisions where possible. The entire services packages are heavily oriented towards energy efficiency.



Relevant websites

NCC
www.abcb.gov.au

NCC Climate zone map
www.abcb.gov.au/Resources

NCC Facade calculator
www.abcb.gov.au/Resources

NCC Lighting calculator
www.abcb.gov.au/Resources

AFRC technical documents

Relevant documents

ABCB *Energy efficiency resources*
NATSPEC TECHnote GEN 011 *Specifying NCC requirements*.
NATSPEC TECHnote DES 013 *NCC Energy efficiency protocol and software for housing*.
NATSPEC TECHnote DES 014 *Environmental rating schemes for buildings*.

Relevant worksections

0171 General requirements
042 Roofing subgroup
043 Cladding subgroup
045 Doors and windows subgroup
046 Glass subgroup
047 Insulation subgroup
07 Mechanical workgroup
08 Hydraulic workgroup
09 Electrical workgroup