

Opening the blinds on Section J and Beyond



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Introduction

The keystone of global climate change strategy since its introduction in 2016, the Paris Agreement aims “to limit global warming to below 2°C, preferably to 1.5°C, compared to pre-industrial levels by 2050.”ⁱ It offers signatories two alternative pathways to this goal. First, and more ambitiously, to cut net carbon emissions by 65% annually until 2030, then continuing cuts until emissions reduce to zero in 2040. Or secondly, to cut annual net emissions by only 50% by 2030 and reach zero emissions in 2050.ⁱⁱ

The ramifications of not achieving these targets,ⁱⁱⁱ are barely worth contemplating, so meeting them is not a question of if but when.^{iv}

In Australia, after years of political impasse, there are signs that the Government is inching towards the zero emissions by 2050 target that many nations have already agreed to. Or perhaps more accurately, factors out of our control – like the election of Joe Biden and likely carbon tariffs from both the US and the EU – are pushing us in that direction.

To be sure, Australia has taken steps in the right direction. The National Energy Productivity Plan (NEPP), a state and federal initiative to increase Australia's energy productivity by 40% between 2015 and 2030, is an example.^v

The plan includes a range of measures aimed at several industries including the construction sector. Changes to the latest version of the National Construction Code (NCC 2019) – and in particular Section J, the part of the Code concerned with the energy efficiency of new buildings – align it with the NEPP and place an onus on specifiers to improve energy efficiency.^{vi}

While NCC 2019 Section J deals with a wide range of building components, this whitepaper is concerned solely with energy efficiency as it applies to windows, and in particular window coverings, in commercial applications. It explains how specifiers can ensure they can employ ways to meet minimum energy efficiency requirements, then takes a step further and examines strategies to improve thermal efficiency of the façade beyond the requirements of the NCC.



Windows, Window Coverings, and Energy Efficiency

First, we need to quantify how large a part of the problem (and the solution) windows are. According to the Blind Manufacturers' Association of Australia, 30% of heating energy is lost through windows and 76% of sunlight that falls on standard double-pane windows enters to become heat,^{vii} so it is fair to say their contribution is significant.

Acknowledging this fact, NCC 2019 Section J takes two components that were previously considered separate, external walls and glazing, and redefines them together as part of the buildings 'external façade'. As a

consequence of this change, commercial facades with a high ratio of glazing to wall area require higher performance glazing compared to NCC 2016. It means that, for glazing ratios above 60% (i.e. typical commercial buildings built today), thermally broken double-glazing systems may be required, where previously single glazed low-e glazing was adequate. And it means that, as the glazing ratio increases, the Solar Heat Gain Coefficient (SHGC) of the glazing becomes more stringent.

A lower SHGC means dark tinting, increased reflectivity, or addition of colouring such as green or blue and reduces natural light within the building. So, in such cases, the use of performance blinds is a good option.





The Pathways to Compliance

As with all building components, there are two pathways to compliance for external facades.^{viii} The first, Deemed-to-Satisfy (DTS) Solutions are prescriptive and are the result of the evaluation of evidence of suitability, expert judgement, or a combination of both. The second, called Performance Solutions, are tailored to specific projects. They involve expert judgement of that application or comparison to ensure they meet the standards of the DTS provisions. Alternatively, compliance can be achieved through a combination of DTS and Performance solutions.

Though all are used, architects tend to prefer Performance solutions over the alternatives, mainly because they allow for more design flexibility. Regardless of the pathway they take, calculating glazing requirements can be difficult, particularly in cases where wall/glazing

combinations are complicated. To help specifiers with this task, upon release of NCC 2019, the Australian Building Codes Board (ABCB) also introduced an 'NCC Façade Calculator',^{ix}

By entering values for relevant variables (glazing systems, wall systems, shading systems, and wall to glazing ratio), specifiers can use the Calculator to run realistic project scenarios and ensure compliance, prior to submitting for Development Approval or to an ESD Consultant.

In relation to window coverings, or 'shading systems' as it calls them, the Calculator notes that "a device must be capable of restricting at least 80% of the summer solar radiation, and if adjustable will operate automatically in response to the level of solar radiation".^x In other words, they need to be carefully considered and highly effective.

Reaching Beyond Section J

The relevant question at this point is – Are the energy efficiency improvements set out in NCC Section J the end of the story? The simple answer is no. Specifications arrived at via the NCC Façade Calculator, or via the various other compliance pathways, should not be viewed as ‘best practice’. Compliance with the NCC should be seen as no more than meeting the minimum requirement and specifiers willing to make the effort can confidently expect to do better.

Smart Buildings and the Internet of Things

The best way to achieve best practice, in terms of window coverings, is to use high performance products along with automation technology. Two important, related concepts – ‘Smart Buildings’, and into the future, the ‘Internet of Things’ (IoT) – are important here.

Building Management Systems (BMS) are the control systems at the heart of Smart Buildings. Correctly configured, and used in conjunction the latest motorised window –of day – at any given time of year – glare becomes a problem for occupants. By ensuring that blinds are open or closed only when they need to be, it helps minimise the need for air conditioning and improve the building’s overall energy efficiency.

The Internet of Things – the use of sensors and digital connectivity to allow ‘Things’ (machinery, forklifts, tools, etc.) to communicate with each other and therefore broaden the scope for automation and usher in previously-unimagined efficiency improvements – has made a huge impact within the technology and manufacturing communities for the last decade or so and has even been heralded as the new industrial revolution.

Importantly for anybody interested in building automation, this technology isn’t only suitable for the industrial sector. It also finds application in the construction sector, where it has given rise to the terms ‘Smart Home’ and ‘Smart Building’.

Though still in its infancy and yet to reach its potential, the Smart Building concept involves occupant-centric control (OCC) of a building’s lighting, heating, cooling, plumbing, security systems and so forth with the aim of maximising the comfort of those within.^{xi} Importantly, in addition to improving tenant comfort, smart buildings deliver significant benefits in terms of energy efficiency.^{xii}

The final part of the equation for those seeking to maximise thermal efficiency, is to seek expert advice from third parties that are aware of all the variables involved and have the expertise to balance them in line with best practice.





VEROSOL

For example, they could enlist the assistance of Verosol, a global leader in window covering solutions and manufacturer of a range of high-performance products including its signature range of SilverScreen fabrics. Employing a process of metallisation to apply a microscopic layer of aluminium onto fabric for use as window coverings, SilverScreen fabrics reflect up to 85 per cent of solar radiation, reduces the SHGC, virtually eliminates UV radiation, and significantly reduces glare.

Verosol's 50-plus years of experience place it in an ideal position to help specifiers not only meet the requirements of Section J but reach beyond them.

To this end, the company has developed its own Energy Savings Calculator. A tool designed to support specifications that have already met compliance, the Calculator works with key variables – including geographical co-ordinates of the site location, glazing surface area, window covering selection, and so forth – to create an annual report that details important energy efficiency information like CO₂ emissions used, cost savings, visual comfort, and visual light transmission.

Used in conjunction with Verosol's range of state-of-the-art roller blinds, external blinds, pleated blinds, roman blinds, panel blinds, solar control solutions, and BMS-compatible operation mechanisms, the Calculator puts specifiers ahead of the pack when it comes to thermal efficiency.

The 2021 United Nations Climate Change Conference is due to take place in Glasgow in November.^{xiii} As we edge nearer to the critical 2030 and 2050 dates set out in the Paris Agreement, it's difficult to overstate its importance.

The topics up for discussion at the summit have ramifications for almost all aspects of human enterprise and definitely all industries. Though much remains uncertain, one thing is clear – if agreement is reached and a way forward is found, all organisations (however large or small) will have a role to play in implementing it. For its part, Verosol has a clear understanding of its role – it will continue to develop and manufacture window covering products that improve energy efficiency and can rightly be referred to as part of the sustainable solution.

References

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