NICCO

TIMBER WINDOWS & DOORS

YOUR GUIDE TO SUSTAINABLE WINDOWS & DOORS

INTRODUCTION

Australians are becoming **increasingly concerned** about global warming and other environmental issues. As temperatures and attitudes continue to change, sustainable building design is becoming less of an option and more of an imperative.

Thankfully, sustainable building design is also becoming easier to implement. A renewed focus on traditional building techniques and the development of exciting new technologies have significantly expanded the sustainable options available to architects, designers, and builders. Today's environmentally friendly homes, shops, and workspaces are often more comfortable and beautiful than their less sustainable counterparts.

Windows and doors are among the architectural elements that have the greatest impact on the overall energy footprint of a building. During all phases of the project lifecycle, architects, designers, and builders should be considering how they can use windows and doors to reduce energy usage.

PLANNING & DESIGN

When thinking about the environmental impact of exterior-facing windows and doors, the most important attribute is orientation. Whether a space can ultimately be deemed energy-efficient depends heavily on where the architect decides to place the windows and glass doors. Put them in the wrong spot, and all of the sustainable materials and building practices in Australia won't be able to offset the high heating and cooling costs.

U-VALUE AND SOLAR HEAT GAIN

The energy efficiency of a window or glass door can be measured by calculating it's U-value and its solar heat gain coefficient (SHGC).

U-value refers to the amount of heat conducted through a material. This value can be used to indicate whether artificially cooled or heated indoor air is escaping through to the outside, or whether warm or cool outdoor air is sneaking in. The lower the U-value of a window or door, the more it will contribute to energy savings.

The SHGC of a window or door indicates how much energy from direct sunlight is allowed to pass through. In cold seasons and cool climates, solar heat gain is desirable. In hot seasons and warm climates, it's best to limit the SHGC as much as possible.

Window and door manufacturers should provide information about each product's U-value and SHGC. Architects and designers can refer to this information when determining which products to use on their projects.

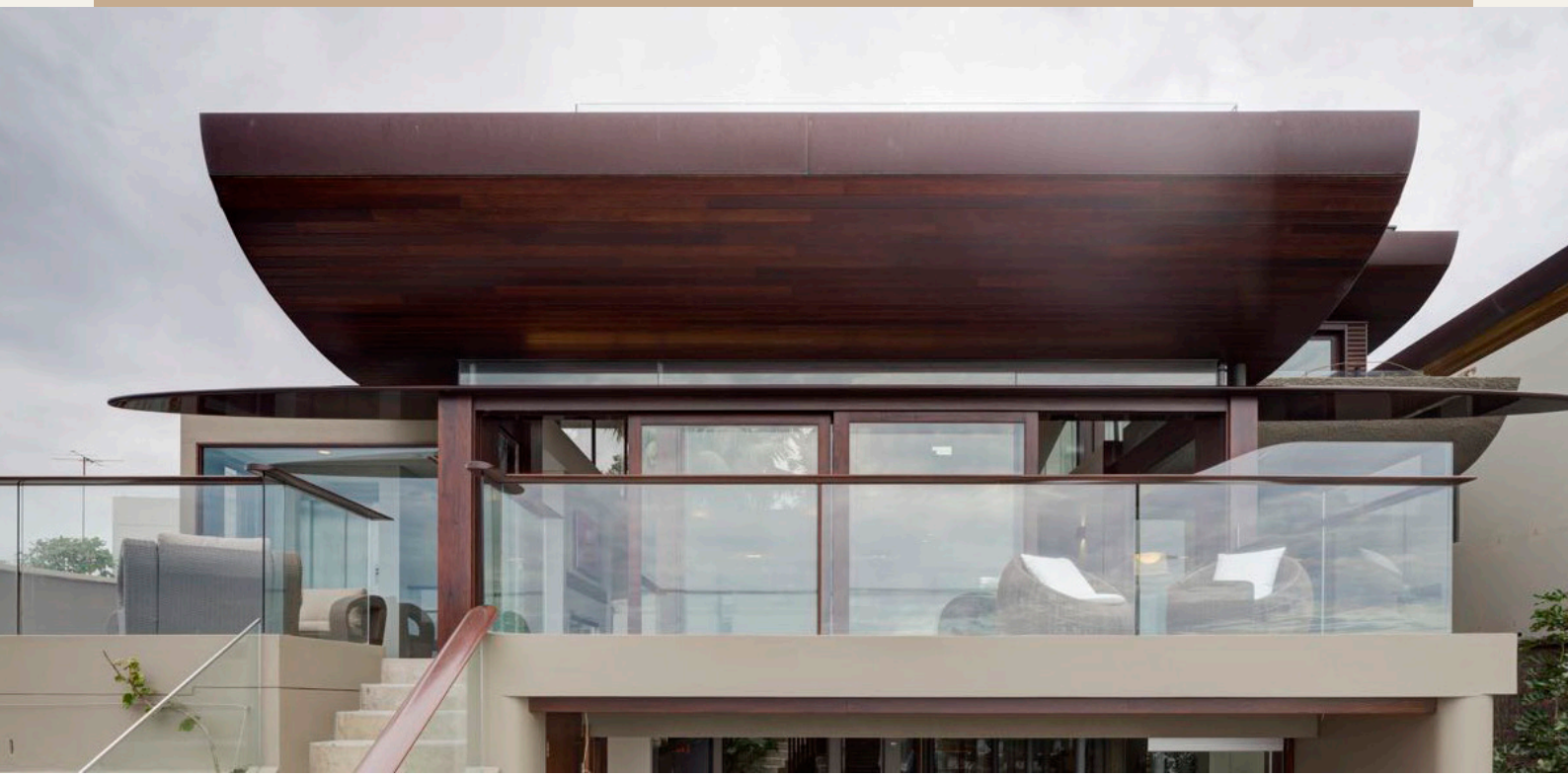
WINDOW LOCATION

Generally speaking, buildings with predominately **north-facing windows** will be more energy efficient than buildings with most of their windows in the direct path of the sun.

However, when making decisions about window orientation, tWhe architect should consider the project's specific location and surroundings. In some cases, neighboring structures can be used to limit solar heat gain on east, west, or south-facing windows.

Passive Solar Heating

Certain structures like awnings and overhangs can be thoughtfully implemented to maximise solar heat gain in the winter and minimise solar heat gain in the summer, improving energy efficiency year-round.



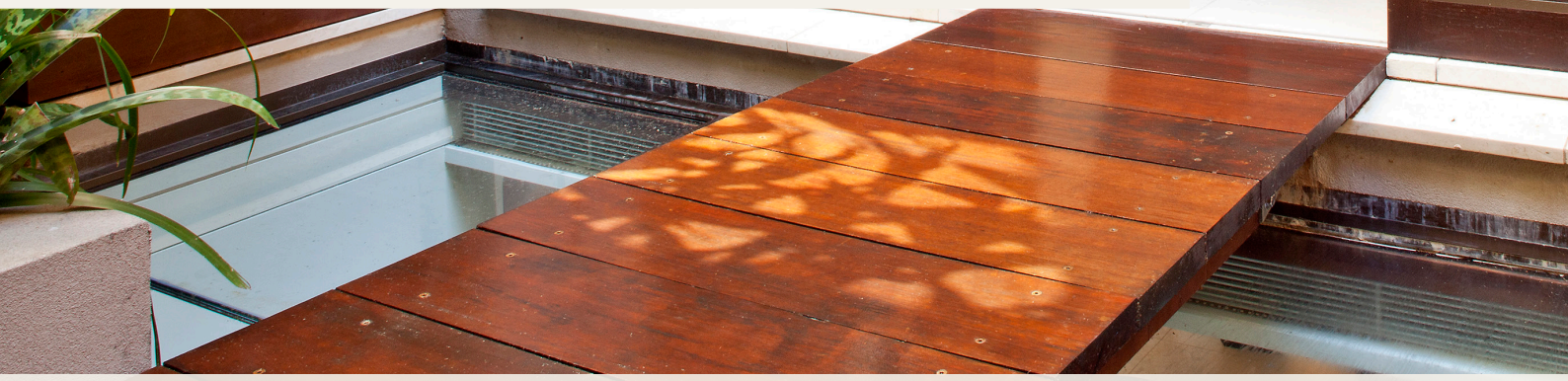
INDOOR / OUTDOOR SPACES

Here's a less mathematical decision architects can make to reduce a building's environmental impact: encourage the use of outdoor spaces.

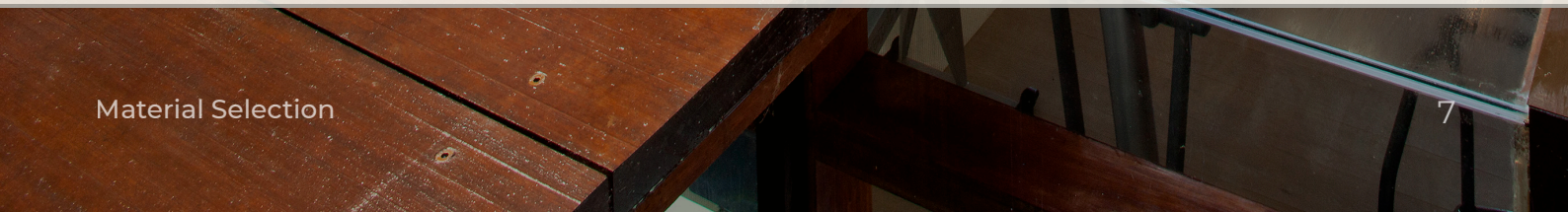
The less time building occupants spend indoors, the less energy they need to use to control the climate in those spaces. Creating comfortable, shady outdoor areas is a great way to encourage sustainable living.

Indoor/outdoor spaces are perhaps the most enjoyable way to open a home to the outside air. Implementing a wall of sliding stacking doors with screens to keep the bugs out could be the perfect solution for homes with limited outdoor space (or with less outdoorsy occupants).

MATERIAL SELECTION



With the position and orientation of windows and doors worked out, architects and designers must turn their attention toward materials.



GLASS

As we discussed, U-value can be used to determine a glass product's energy efficiency. Glass manufacturers have several different methods for reducing a window's U-value, and aesthetics and cost must be considered when choosing which is most appropriate for a project.

Some windows and doors will use glass with special coatings to keep out certain wavelengths of light, while others will use insulating pockets of air (double glazing) to reduce energy transfer. No matter which solution you choose, the windows with the **lowest U-value** are still likely to provide the greatest energy savings.

Think Outside the Glass

Window and door furnishings like awnings, louvers, blinds, shutters, and films can also be used to limit the transfer of solar energy into a building. External structures like awnings, louvers, and shutters are more effective at reducing solar heat gain than internal structures like blinds and films.

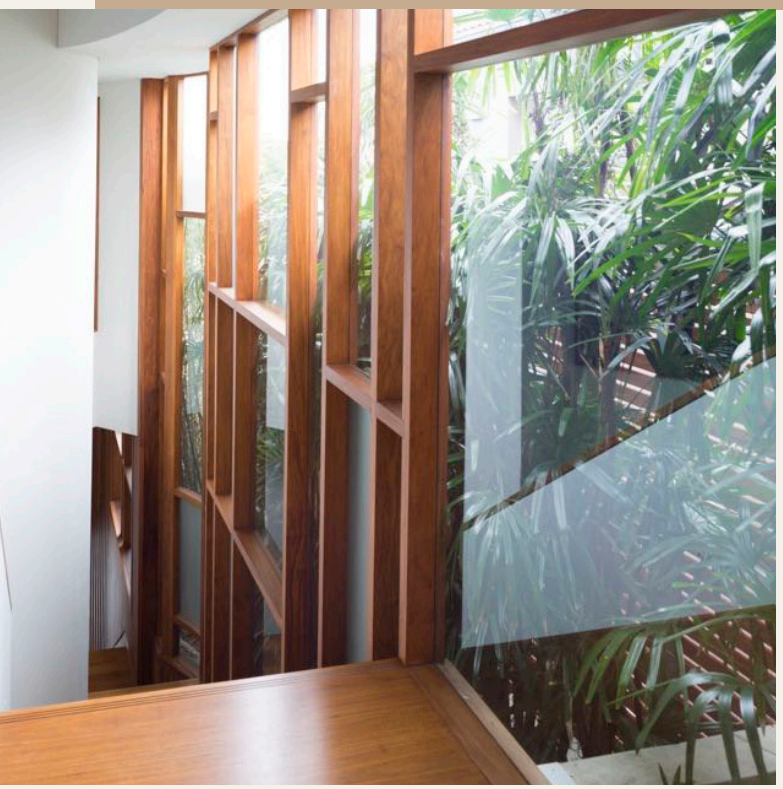
FRAMING

The three main options for window and glass door frames are timber, aluminium, and PVC. In addition, some manufacturers will use a combination of aluminium and PVC.

Of all these options, timber is unmatched for sustainability. Timber frames require much less fossil fuel to produce than either aluminium or PVC. In addition, timber is much better than aluminium at reducing heat transfer.

WINDOW TYPE	U-VALUE
Aluminium window Double glazed with 3mm clear glass/6mm air gap/3mm clear glass	**4.2**
Timber window Double glazed with 3mm clear glass/6mm air gap/3mm clear glass	**3.0**

[Source: **yourhome.gov.au**]



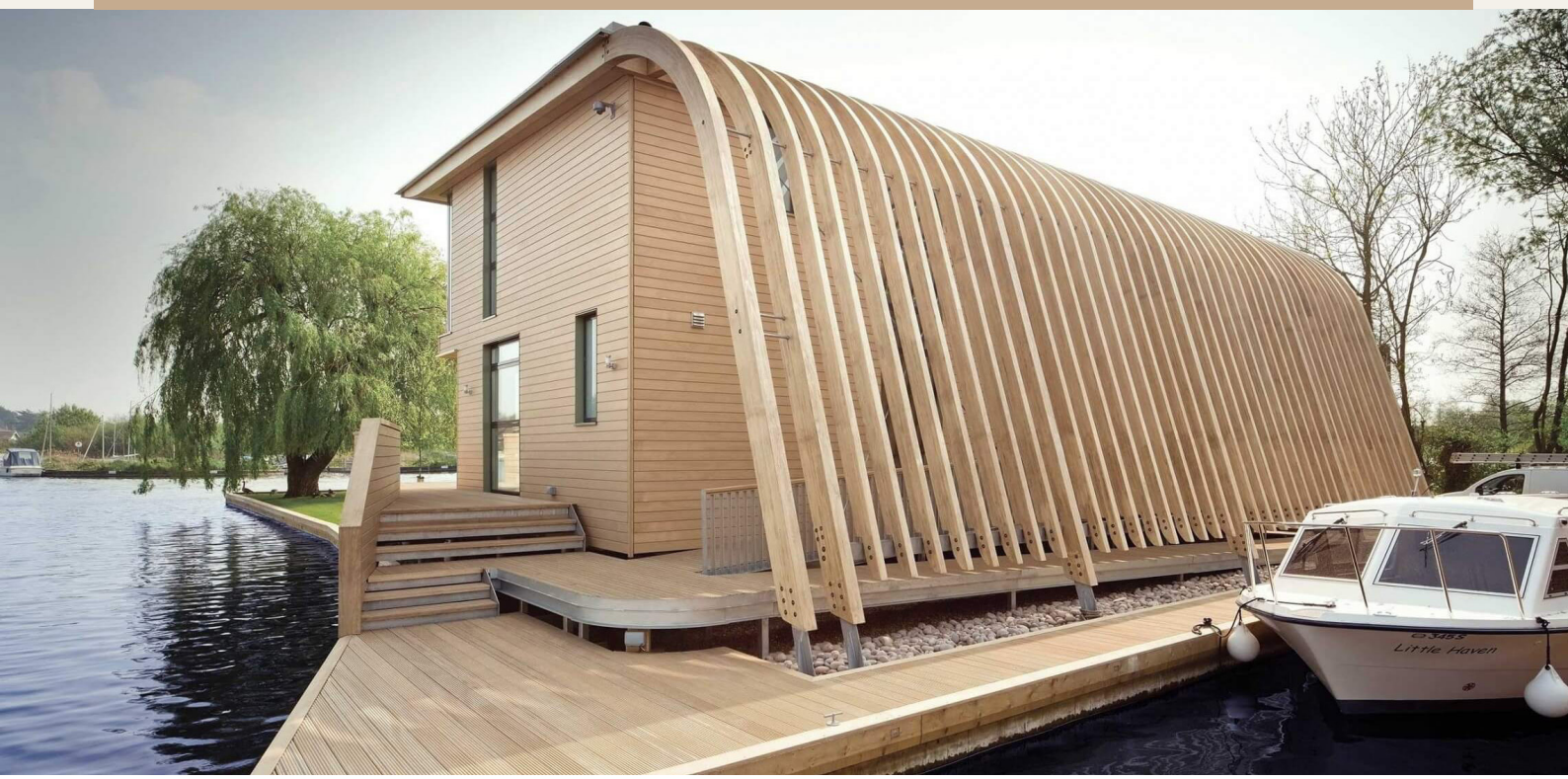
TIMBER CONSIDERATIONS

When procuring timber for windows or doors, it's important to make sure the timber was sourced sustainably from a well-managed forest, and that no excessive carbon emissions were created in its transport from forest to manufacturer.

Certain international organizations like the **Forest Stewardship Council** offer certifications that make it easy to identify timber that meets their standards. In addition, the Australian Government has adopted **sustainable forest management standards**, which are recognized as some of the best in the world. Architects, designers, and builders can be confident that as long as they're not using imported timber, they're likely using sustainable products.

Treated Timber

Accoya® wood is sustainably sourced, fast-growing wood that's been treated with a non-toxic acetylation process to make it more durable and dimensionally stable. Because the trees used to make Accoya® wood grow much faster than tropical hardwood species, it's the perfect option for maximum sustainability.



BUILDING & MAINTENANCE

Builders must take care to ensure a good fit between a window or door and its surrounding structure. Any holes or gaps can let warm or cool air in and out, negating hard-earned energy savings.

WINDOWS AND GLASS DOOR

Windows and glass doors should be cleaned frequently to allow maximum light transfer, especially in the summer. In addition, windows and doors should be checked every few years to make sure no warping has occurred that might affect their insulating properties.

CONCLUSION

When drafting, designing, and building a structure for minimal environmental impact, windows and doors should be top-of-mind. Few other architectural elements play as big of a role in determining the long-term energy footprint of a building.

By thoughtfully positioning windows and doors, selecting sustainable materials, and taking care in construction, architects, designers, and builders can create beautiful, comfortable, environmentally friendly spaces for their clients.

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