**Title: Building for Comfort Part 1 - The Sun**

*You can design and build a home to be naturally warm in winter and cool in summer: a comfortable home that saves money and is better for the environment. These two Building for Comfort videos explain how. This first video looks at building to take advantage of the world's only true source of energy - the sun.*

**The sun and its path**

***The concept****: Each square metre of sunlight provides us with up to 1000 watts of energy on a summer's day.*

* In **winter**, sun moves across the **northern sky** at a low angle of elevation
* In **summer** the sun moves across the sky and is almost directly overhead at midday, radiating on the **east and west** facades in the morning and afternoon

*By following some straightforward rules when designing and building, we can capture this free energy in winter when we need it, and block it in summer when we don't.*

**Glazing**

*Normal glass allows up to 90% of the sun's heat directly into the house, so the location, size and type of glass is a critical aspect of design.*

Install more glass on the north façade where it's easy to let in winter sun

Install less on the east and west where it is difficult to block out the hot summer sun

The Solar Heat Gain Coefficient, or SHGC, is measure of the amount of solar heat that passes through the glass. The higher the SHGC, the greater the heat that passes through. **<<GREY HIGHLIGHER = TEXT BOX OR SOMETHING SIMILAR TO MIX IT UP>>**

In temperate climates, install glazing with a high SHGC on the northern side of the house to allow the winter sun in

On the east and west, consider low SHGC glazing to keep the solar heat out

Check the Windows Energy Rating Scheme (WERS) label to help select the right glazing. It contains the SHGC at the bottom of the label, as well as other measures such as U-Value. www.wers.com.au

**Shading**

*Appropriate external shading will be even more effective that high performance glazing*

On the east and west, install vertical shading such as shutters, pull-down awnings, shade cloth, and vegetation

On the northern side, install horizontal shading such as eaves, which will block direct summer sunlight whilst allowing the low angled winter sun in. As a rule of thumb, shading should extend out no more than half the height of the window.

Adjustable shading is a good option, allowing the householder to control solar heat gain depending on comfort

**Colours**

In cold climates choose darker colours of walls and roof to absorb solar heat. In warmer climates choose lighter colours

Some paints have solar reflective properties for reduced heat gain – for more info and to search for products use [Ecospecifier.com.au](http://WWW.ECOSPECIFIER.COM.AU)

**Building layout**

North facing areas are a good spot for living areas.

Locating the garage or laundry on the western side will create a heat barrier to the rest of the house in summer afternoons.

A longer northern layout allows more solar gain in winter than summer.

**Resources**

* Your Home design guide [www.yourhome.gov.au/](http://www.yourhome.gov.au/)
* Energy Smart Housing Manual, Sustainability Victoria
  + [Ch 1 – Benefits of energy smart housing](http://www.sustainability.vic.gov.au/resources/documents/ESHousingManualCh01.pdf)
  + [Ch 2 - Energy smart design](http://www.sustainability.vic.gov.au/resources/documents/ESHousingManualCh02.pdf)
  + [Ch 3 - Sun, climate, comfort](http://www.sustainability.vic.gov.au/resources/documents/ESHousingManualCh03.pdf)
  + [Ch 4 - Siting and solar access](http://www.sustainability.vic.gov.au/resources/documents/ESHousingManualCh04.pdf)
  + [Ch 5 - Windows](http://www.sustainability.vic.gov.au/resources/documents/ESHousingManualCh05.pdf)
* HIA Green Smart magazine <http://hia.com.au/Publications.aspx>
* Other sustainable building magazines such as [Sanctuary](http://www.sanctuarymagazine.org.au/), [Green Magazine](http://www.greenmagazine.com.au/) and [Green Living](http://www.universalmagazines.com.au/_webapp_239086/Green_Living)
* NSW Government [Save Power website](http://www.savepower.nsw.gov.au/)
* Australian Government [Living Greener website](http://www.livinggreener.gov.au)

**Training Courses**

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| **Course Provider** | **Name of Course** | **Contact details** |
| Masters Builders Association (MBA) | Green Living | (02) 8586 3555  <http://www.masterbuilders.com.au/GreenLiving> |
| Housing Industry Association (HIA) | Introduction to Green Skills | (02) 9978 3333 or 1300 650 620  <http://hia.com.au/upload/hia/documents/trainingandevents/2011/actsnsw_training_dir_120111.pdf> |
| Green Smart Professional |
| Association of Building Sustainability Assessors (ABSA) | Residential Building Thermal Performance Assessment Training course | 1300 889 438  <http://www.absa.net.au/site.php?id=465> |
| Australian Fenestration Training Institute (Australian Windows Association) | Glazing Calculator Course  Introduction to Windows  Windows level 1 & 2  Energy and WERS | <http://www.afti.edu.au/index.htm> |