

House address

Agent's name and contact.....

A practical checklist for **SELECTING A MORE COMFORTABLE HOUSE WITH LOW RUNNING COSTS** *and saving our environment*

This checklist is relevant to **one** house only and its purpose is to enable prospective buyers to easily compare a few houses for effective use of the sun, economical use of energies and of water.

You will need a compass and a measuring tape.

Please read first :

Your home is probably the most expensive purchase you will ever make. Careful thought now can save you a lot of time, money and future discomfort and the resale value will likely be higher if you have selected wisely.

A quick sketch of the block and the house may help to remind you of its features when you are comparing. Don't forget to put the compass north point on this sketch, bearing in mind that true north is 13° west of compass north. Add the block and section number and any significant trees which might shade the roof now or in future.

Climate change is generally predicted to result in **hotter, drier and more extreme weather throughout southern Australia and *it is already happening*. Modern housing needs to adapt to these challenges.**

This checklist can be used in all areas in Australia approximately south of a line from Perth (WA) to Newcastle (NSW), having cool to cold winters and warm to hot summers. It is not likely to apply to areas further north or very hot inland areas without some reconsideration based on the local climate.

The checklist can be used to broadly assess an *existing* home, a *new* project home, or a *new* house plan in relation to your comfort in such a house and its effectiveness in using energy. *It does not cover* all the more personal factors in choosing your home - such as location, number of bedrooms, proximity to shops/school/transport, affordability and finance which you will be considering. The five most important issues for reducing energy consumption in a house in these more temperate areas of Australia are :

- * *orientation* with adequate north facing glass to admit the warming winter sun,
- * *shading* to exclude hot summer sun,
- * *insulation* to minimise heat loss and heat gain,
- * *internal mass* (brick or concrete walls) to stabilise internal temperatures throughout the year.
- * *ventilation*, to assist the heating and cooling of the house and its occupants.

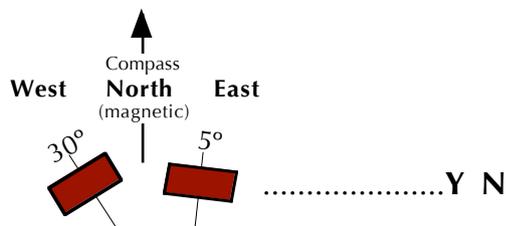
The checklist is simple to use, with little technical knowledge required. However, considering the large amount of money involved it is certainly in your interests to inform yourself on aspects you may not fully understand. Further reading on all the questions is suggested on the back page.

How to use the checklist

- 1 Fill in a separate copy of this checklist for *each house* you wish to consider more closely.
Obtain more copies from the web <www.natsoc.org.au> or feel free to photocopy this checklist.
- 2 Fill in the house and agent details in the box at the top of this page.
- 3 For EACH QUESTION in this checklist circle either **Y** (Yes) or **N** (No) in the right hand margin.
- 4 Circle **F** (Fixable at a later time) *only* if the listed conditions can be satisfied.
- 5 Consider your circled answers - **Y**, **N** or **F** using the guide in the box HOW TO ASSESS...on back page.
- 6 Compare your answers with those from other houses you may be interested in.

ORIENTATION

Q1 Does the long side of the house (with windows to the main living areas) face between 5 degrees east of compass north and 30 degrees west of north?



This is the most important question - if your answer is NO this house will not be able to use the winter sun for warmth. The more it is outside these limits the more expensive it will be to run and it will not be possible to fix in the future. You should seriously consider if it is worth buying this house.

WINDOWS

Q2 In all *northern* living areas, is the window area larger than half the floor area?Y N F
If NO, solar heating is likely to be inadequate. It may be fixable, but is likely to be expensive.

Q3 Will low angle winter sun be able to enter these *northern* rooms for most of the day?Y N F
Circle NO if there is possible shade from existing evergreen or non-removable trees (particularly if on neighbouring land), neighbouring houses, verandas or large eaves (see Q4) + F if it is likely you will be able to remove the cause of the shading.

Q4 Can high angle summer sun be excluded by external shading devices from these *northern* rooms for most of the day?Y N F
Eaves should start near the top of the window and project horizontally no more than 20% of the window height. Eaves should preferably extend beyond either side of the window. Circle NO if there are no eaves or shading devices, + F if it would be possible to fit overhead sunshades extending about 1m out from the window or a pergola about 3m from window for deciduous creepers.

Q5 Are eastern or western windows shaded externally from low angle summer sun?.... Y N F
If NO, there could be excessive heat gain and some control will be needed, at least to western windows + F if full shade control could be fitted later. Internal curtains/blinds do not reduce heat gain.

Q6 Is each *southern* window in a bedroom or daytime living area smaller than half the floor area?Y N F
If NO then external reflectors are not likely to be effective. Circle N+F where larger than half, if :
- southern reflectors could be fitted about 1.5 to 2m outside these windows, and
- there is no gable roof above the window (see reading list 2, page 6-2...)
Note : southern reflectors can reflect heat **and** sunlight into these usually sunless rooms in winter.

Q7 Are all windows well sealed against draughts?Y N F
If NO, circle N+F if windows can be easily sealed. Wooden sash windows are very hard to seal. For more information on window seals, pelmets and curtains see Reading List 1 and 2.

Q8 Are windows to bedrooms and living areas double glazed?Y N F
If NO, circle N+F if there is at least 20mm thickness of framing inside the existing glass to allow for DIY double glazing, or if a supplier confirms that commercial double glazing can be fitted.

FLOORS AND INTERNAL WALLS

Q9 Does the house have a concrete slab floor, with a polished finish or covered with tiles, brick, slate?Y N
Timber or carpet over concrete reduces its ability to store solar heat. Rugs are acceptable if removed out of the sunlit area during sunny winter days. This is usually not fixable. If NO, skip Q10.

Q10 Is the concrete slab insulated around its exposed external edges?Y N
This may be hard to see - if so, ask the house agent. It is hard and expensive to retrofit.

- Q11 If a traditional wooden floor, has it been insulated underneath to a minimum R2 rating?**Y N F
 If NO, circle **N+F** only if there is adequate underfloor access to allow for fitting insulation.
- Q12 If a wooden floor, are there internal brick walls in northern rooms?**Y N
 If NO, these rooms will be hotter in summer and colder in winter, even if the floor and walls are insulated. This situation is not usually fixable.

EXTERNAL WALLS AND DOORS

- Q13 Are all external walls insulated to a minimum R2 rating?**Y N F
 If NO, circle **N+F** only if cavity walls can be filled with injected insulation. Ask the agent.
- Q14 Are all external doors well sealed against draughts?**Y N F
 If NO, circle **N+F** if doors can be easily sealed. Some sliding doors and older wooden doors are hard to seal. **Modern** aluminium sliding doors are usually adequately sealed.

CEILINGS AND ROOFS

- Q15 Are all ceilings insulated to a minimum R3.5 rating?**Y N F
 If NO, circle **N+F** only if there is adequate access to roof space to install insulation.
 Ceilings which are parallel to the roof are often inadequately insulated and expensive to fix.
- Q16 Is the roof lighter in colour than a standard terracotta tile?**Y N F
 Dark roofs absorb too much heat in summer, but can be painted, circle **N+F** if this is likely.
 Air conditioners, however, are expensive to buy as well as expensive and polluting to run. Their large scale adoption is very bad for the environment.
- Q17 Is there reflective foil below the tiles or metal roof?**Y N F
 It is difficult to rectify this omission, but can be done if plenty of space. Circle **N+F** if likely.

SOLAR ABSORBERS ON ROOFS

- Q18 Are solar hot water panels fitted on a near north facing roof?**.... Y N F
 If NO, and you think it is likely you will be installing a solar hot water system in future, then you will need the following type of roof:
- the northern facing roof which has a slope of between 15 and 30 degrees (a normal tiled roof is usually about 22 degrees), and
 - there is a space about 2 metres by 2 metres to install solar hot water panels on this roof, and
 - that particular roof area is free of shade for most of the time on sunny days.
- If this roof satisfies all three conditions, then circle **N+F**
- Q19 Are solar photovoltaic panels fitted on a near north facing roof?**Y N F
 If NO, and you think it is likely you will be installing photovoltaic panels in future, then you will need the following type of roof :
- the northern facing roof has a slope of between 15 and 30 degrees, and
 - there is enough rectangular space to install solar PV on this roof (typically 20 to 40 sq.m, check panel sizes with an accredited supplier), and
 - this roof area is free of shade for most of the time on sunny days.
- If this roof satisfies all three conditions, then circle **N+F**

HEATING, COOLING AND VENTILATION

The format of Q20/21 is different to produce positive, low energy, low pollution Y answers

- Q20 If reverse cycle or evaporative airconditioning is NOT fitted, circle Y**Y N F
 Refrigerative systems use a lot of electricity and evaporative also use lots of water - both undesirable.
A well oriented, constructed, insulated, ventilated and shaded house should not need cooling.
- Q21 If in-slab heating is NOT fitted, circle Y**.....Y N F
 It is expensive to buy and run and too polluting to use. Gas heating is preferable.

Q22 Is natural gas heating installed?Y N F
NO?, circle N+F if natural gas can be connected (check with the local gas company).

Q23 Is there at least 1 square metre of roof ridge ventilation?.....Y N F
NO?, circle N+F as ridge vents can usually be fitted to normal pitched roofs, and do not need to be closable if the ceiling space is well insulated. It is difficult to retrofit a ridge vent to sloping ceilings.

Q24 Are there closable ceiling vents (totalling at least 1 square metre) which let hot summer air into the roof space (and out through the ridge vent)?Y N F
NO?, circle N+F as vents can be fitted to any ceiling, but MUST be easily closable. One vent could be over the refrigerator. Vents can also double as skylights (see Reading List 2, page 10-2).

LIGHTING

Q25 Are compact fluorescent light fittings installed throughout the house?Y N F
NO? Circle N+F if 240v halogen downlights installed. Circle N only if 12v halogens which cannot be exchanged for 240v compact fluorescents. Confirm voltage with the agent.

WATER SUPPLY, PLUMBING AND DRAINAGE

Q26 Is laundry and bathroom grey water re-used for a second purpose (ie. garden)?....Y N F
Circle Y if connected to a treatment unit, or directly into a percolation pipe in the garden subsoil?
Circle N if connected to the sewer. Circle F if a diverter can be fitted to the laundry tub which gives a fall to garden level with an extension hose. Confirm with the agent.

Q27 Are there adequate water tanks for domestic use?Y N F
Circle Y if there is at least 4000L storage per person with a fail-safe mains connection. This should supply about half your consumption, if careful. Circle N if there is less than the above or no room around the house to install adequate tanks. Circle F if this (or more)storage can be retrofitted later.

Q28 Are metal leaf guards fitted to all gutters?Y N F
NO? Circle F as leaf guards are easily fitted. They improve rainwater quality and reduce fire risk.

HOW TO ASSESS YOUR Y N F ANSWERS ←————— Totals:

All YES answers? Somewhat unlikely, but if so, it seems that this house is designed for your comfort with low running costs and lower impact on the environment!

Put it at the top of your list!

Some NO answers? Consider each NO answer carefully in relation to your needs.

Every NO answer is likely to make the house less energy efficient, more expensive to heat and cool and less comfortable to live in.

The more NO answers the more this house will be increasing climate change.

For each FIXABLE answer, consider whether you can fix it yourself (and when) or if you will need professional help. Consider the likely cost in relation to the potential long term gain. Turning every NO to YES helps everybody and the environment.

READING LIST

- 1 **YOUR HOME Technical Manual**, pub. Aust. Greenhouse Office, <www.yourhome.gov.au>
- 2 **MAKING YOUR HOME SUSTAINABLE**, A guide to retrofitting, Derek Wrigley, pub. Scribe Melb.
- 3 **WARM HOUSE COOL HOUSE**, Nick Hollo, Pub. Aust. Consumers Assoc. Sydney.
- 4 **CLIMATE CHANGE NEEDS HOUSING CHANGE**, pub. Nature and Society Forum, Canberra

This brochure has been co-authored by Derek Wrigley, OAM, Emer. Prof. John Sandeman, OAM, and Simon Fisher, with guidance from the Solar Housing Group of Nature and Society Forum, including representatives of the ANZ Solar Energy Society and the Alternative Technology Association. It is the hope of these organisations that by free distribution and permitting photocopying that the buying public can be empowered to choose more carefully, obtain better value for money and, most significantly, *reduce the emissions of greenhouse gases that are damaging our planet.*

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