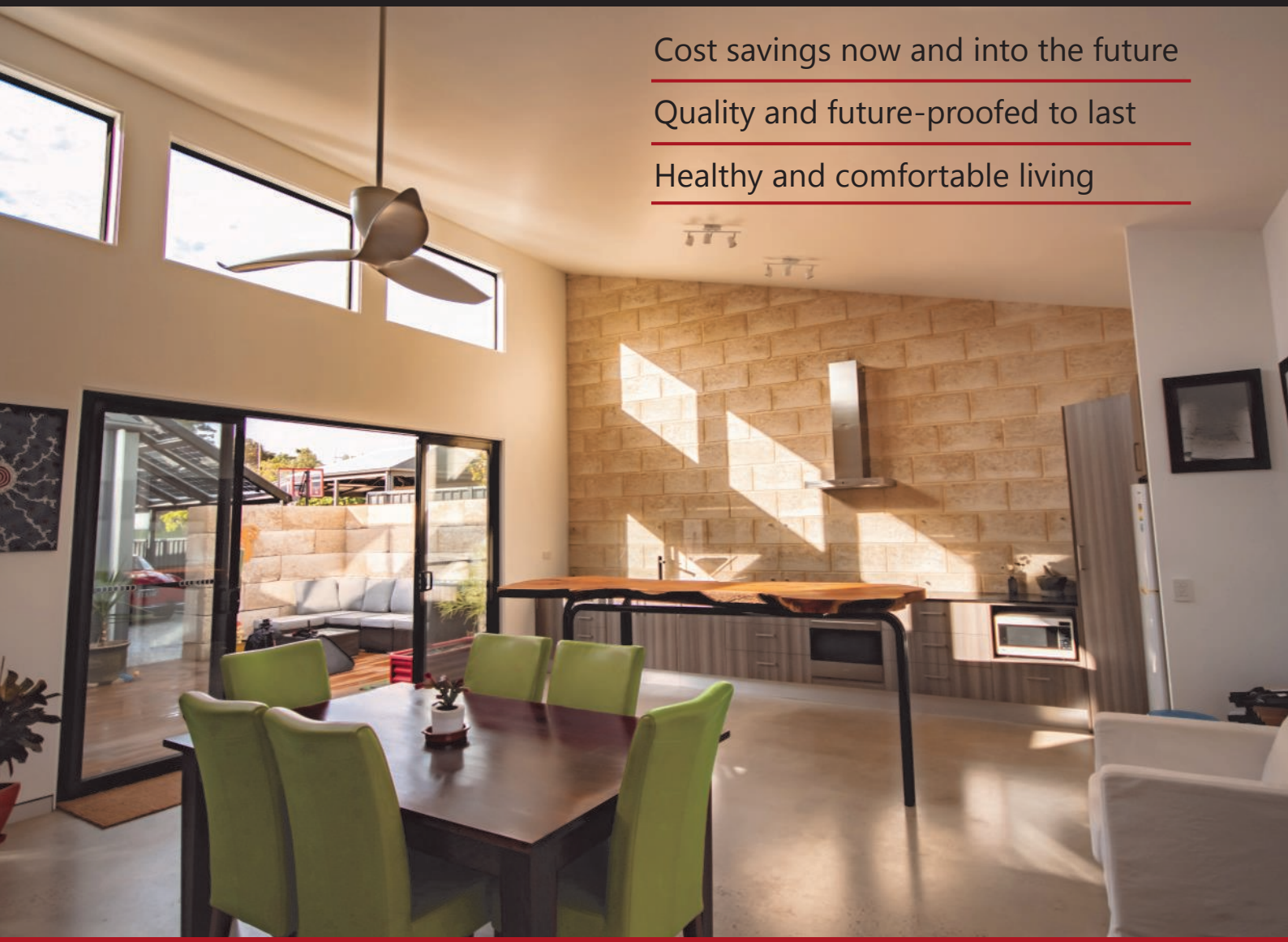
your new **Home**

A step-by-step guide to buying a home

Buyer's Guide



Cost savings now and into the future

Quality and future-proofed to last

Healthy and comfortable living

YOUR HOME • YOUR FUTURE • YOUR LIFESTYLE

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SEE-CHANGE

COMMUNITIES CREATING A SUSTAINABLE CANBERRA

Buyer's Guide

Buying a home is an exciting process. This Guide will take you through the steps involved with choosing a home, explaining what to look for and the important questions to ask, especially if you are new to the process.

What is covered in this Guide?

This Guide covers the steps shown in colour in the diagram on the next page.

It discusses the choices you'll need to make in relation to buying or building your home* (steps 1,2,3,4,6,7,9 and 12), but doesn't cover the steps shown in grey (steps 5,8,10 and 11). The steps not covered include:

- Step 5: Arranging your finance; selecting building professionals to engage in the process (including getting multiple quotes to compare the market and checking their licenses, previous history and jobs); and obtaining legal advice.
- Step 8: Having your plans prepared and making sure you check these carefully to ensure they include everything you want.
- Step 10 and 11: Getting authority approvals and building your home.

For more information about these matters, speak to your council or relevant authority, the Experts** who you engage in the process, or refer to the consumer guides of the relevant state and territory where you are looking at buying or building.

If you live in a tropical climate, design advice about some issues can vary from what's written in this Guide. See as well the Guide for Northern Australia at www.energy.gov.au.

Please also note:

* The focus for this Guide is on buying or building individual new homes, but many of the principles also apply to buying apartments, other house types or existing homes.

** The term 'Expert' in this Guide means the building professionals you are engaging to work with you on your home, such as a Volume/Project Home Building Company, Architect, Designer, Draftsperson, Engineer, etc.

You can also find this Guide and a range of Checklists online at: ***www.see-change.org.au***

12 steps to buying a home

	You and your family	You and your Expert working together	Your Expert
step 1	Get started	see pages 4-5	
step2	Plan your budget	see page 6-7	
step 3	Choose where to live	see page 8-9	
step 4		Choose your home	see pages 10 – 13
step 5	Arrange your finance, Experts and obtain legal advice		
step 6		Work with your Expert (room by room)	see pages 14-17
step 7		Select heating & cooling, fittings & appliances	see pages 18-21
step 8			Prepare your plans
step 9		Select colours & finishes, and outdoor areas	see pages 22-25
step 10			Revise your plans and manage the approvals
step 11			Finalise your plans and build your home
step 12		Finish-off	see pages 26-27

Your home is ready and you move in

step 1

Get started

step 2

Think about your needs

step 3

Your home is important in many ways. It's a place to relax and spend quality time with family and friends. It's probably also the biggest investment you'll make.

step 4

Use this Guide to choose a home that will meet your needs, be cheaper to run, be kinder to the environment and provide the best value for money – now and into the future.

step 5

While energy efficient features, such as good insulation and a high efficiency heat-pump hot water system run off photovoltaic (PV) power, might cost a bit more upfront, they can save on your energy bills and are worth the investment.

step 6

This Guide is designed to reduce some of the stress out of choosing your home. Although there is so much to consider, from prices and layouts through to product and colour selections, this is the opportunity to get what you want in your new home.

step 7

This Guide (and the 'Before signing a contract and building' checklist) will also help you pick your Experts. Working with Experts who share your values will make the process of achieving your ideal new home much easier.

step 8

'Thinking through what we wanted first saved so much time once we started looking.'

step 9

The checklists on each right-hand page are a useful reminder of features that can add value to your home and make it a more comfortable place to live. You can use them when you're comparing different homes and products, or you can use them as a reminder list when talking with sales staff and Experts.

step 10

There are links throughout this Guide to the comprehensive information in *Your Home*, where you can find out more about whatever interests you.

There are also different ways you can go about purchasing your home. You can:

step 11

- purchase land first, then choose a home to suit
- choose your home first, then purchase land
- choose a house and land package
- buy an existing home,
- knock down your existing home and rebuild.

step 12

From a design perspective it's better to choose your land first if you can, then choose a home to suit. However, choosing a house and land package or buying an existing home can minimise some of the complications, but it also limits some of your choices.

Whichever way you decide to go, aim for the best match you can get between your land and your home. Read on to find out how.

Using this Guide

Use this Guide to:

- think through your needs and create your 'wish list'
- compare different homes and products
- find the best value for money, now and for the future.

If you live in a tropical climate, design advice about some issues such as orientation and shading can vary from what's written here. See as well the climate-specific information on *Your Home*: www.yourhome.gov.au or the Guide for Northern Australia: www.energy.gov.au/household-guides/northern-australia

You'll be amazed by how much good design can improve your lifestyle – and good design starts with finding the best match between your land and your home.

Start with a list

The process of buying a home can seem complicated. To help you remember all the details and get the most out of the process, it's a good idea to start with a list.

Write down your 'must haves' so you know what your priorities are. Buying a home is an emotional process and sometimes it's easy to fall in love with a particular house or house feature, forgetting about what you originally decided you needed to suit your lifestyle and budget. Your 'must haves' may include things like number of bedrooms, good natural light, separate play area for the kids and an outdoor living area. Consider too how these needs may change in 5, 10 or 20 years. For example, will grandparents be moving in or children moving out?

Next write down your 'wish list'. Your 'wish list' should include extras that would be of great value or use to you, like an alfresco dining area with shade in summer and good sunlight in winter, PV-powered electricity, heat pump hot water or a rainwater tank.

There are many places you can go for information and ideas, including home magazines, websites, display villages and home ideas centres. Talk to friends and learn from their experiences. Thinking through what you want first makes it much easier once you start talking to Experts and sales people.

Your lists will also help you to prioritise what you really need, whilst staying within your budget. They will be extra handy when making decisions part way through your project – it's easy to lose track when you're making lots of decisions, so reviewing your lists can get you back on track.

Checklist: Our needs

Our family's 'must haves':

Our family's 'wish list':

Number of bedrooms:

Number of bathrooms:

Other important features for us:

Our budget range:

Tips:

Make sure your 'must have' list includes features that save on running costs and enhance resale value, like good insulation and an efficient hot water system.

Think about how often your family might use a formal living or dining area before you add them to your 'must have' list.

Consider making spaces adaptable to meet future needs, like a change in family arrangement. Perhaps one larger room shared between two, or a temporary separator that could be removed later, would make the space useable for another function or family configuration in the future.

Buying your first home

If this is your first home, talk to people who've already built or bought a home and find out what worked for them. What do they like – what would they change? Which rooms are their favourite and why? How does the amount of sunlight change the warmth and feel of different parts of the home? Would they change anything about the floor plan or the style?

Find out more

Your Home is an award-winning guide to environmentally sustainable housing, with over 500 pages full of handy tips and ideas, plus home design examples from around the country. It's available free online at: **www.yourhome.gov.au**

step 1

Plan your budget

step 2

Invest in the long term

This is your opportunity to find a home that's not only good value upfront, but holds its value over time. Your decisions at this stage will have important consequences for your future, so you want to get it right.

step 3

When you start looking at homes, it's easy to focus on the short term – 'what can I afford right now?' But ongoing costs are very important too. For example, an energy efficient home means lower energy bills, so you can use the savings to pay off your mortgage faster. You could save hundreds of dollars a year on electricity bills by choosing a better home design with efficient lighting and appliances.

step 4

Times are changing fast and new issues need to be factored into investment decisions. This is sometimes called 'future proofing' – making sure your investment will hold its value over time (see the next page for more details). Protect your investment against rising energy, water and petrol costs by ensuring your home saves energy and water and is close to everything you need, including public transport. Choose durable, long-lasting materials that don't need a lot of maintenance. These choices also have an impact on resale value.

step 5

Regulations for new buildings also get stricter over time, and when you sell your home you want it to be able to compete with newer, more energy and water efficient homes.

step 6

Factor in all the costs

When you visit a display home village, the prices displayed are usually base house prices, from which point you can choose upgrades and features. It's often difficult to compare 'apples with apples', because what's offered as a standard inclusion by one company may not be offered by another.

step 7

Whether buying a new or existing home, many home buyers say they wish they'd known about the hidden costs right from the start. Check with your Expert and sales staff about which of the following items are included in the quoted price:

step 8

- Stamp duty and solicitors fees
- Rates, and body corporate fees
- Council/authority approval fees
- Construction insurance premiums and other insurances
- Soil test by a qualified engineer
- Connections to services
- Excavation and drainage
- Driveways and landscaping
- Legally required construction extras (e.g. scaffolding, security fencing)
- Lighting
- Floor finishes (e.g. carpet, tiles, etc.)
- Kitchen cabinets, benchtops, sinks and appliances
- Curtains and blinds.

step 9

Make sure the cost of meeting state and territory government and local council/authority regulations (such as energy ratings, rainwater tanks, etc.) has been factored into the quoted price.

step 10

Lock in long-term cost savings now

Take time to think about your budget – this is your chance to lock in features that hold their value and save you money, such as:

- a design that uses space cleverly
- a comfortable home with a high energy rating
- water and energy saving features.

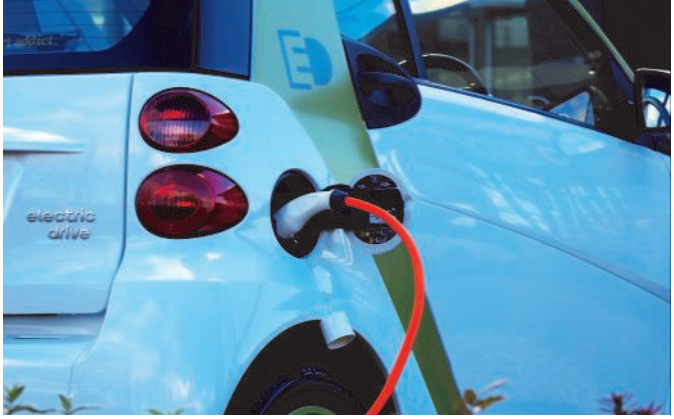
Many of these features don't cost extra, and those that do cost more upfront are usually quickly repaid by savings in energy, water and maintenance bills.

step 11

Beware of contract variations

Avoid making variations to your home during the build stage, as this can end up in big cost overruns – aim to get your changes documented and costed before your contract is signed (refer to the 'Before signing a contract and building' checklist). If you do ask for changes during the build stage, make sure you get a written quote and you agree to the extra costs and time of any variation in writing. Remember to get everything in writing – never rely on what you think are verbal agreements.

step 12



Future-proof your home

Designing your home with future-proofing features will make sure it's resilient, efficient and able to cope with extreme weather events, increasing electricity and gas prices, and to always have power when you need it.

Most states and territories are increasing the amount of renewable power available to the grid, so if you focus on creating an all-electric home, you will know more of your power will be coming from renewable energy sources. It also makes sense to not pay two supply charges for both gas and electricity.

The efficiency and functionality of electric heating and cooling systems, heat pump hot water services and induction cooktops has improved greatly in recent years and now provides a range of options at different price points. By creating an all-electric home and combining it with PV-power and batteries, your home can be much more resilient to power stoppages.

With the price of PV panels and batteries continuing to fall, it is a good idea to install a system when you build or make sure you have the wiring and enough north or west facing unshaded roof space for panels to be installed in the future.

At some stage there is likely to be an electric or hybrid vehicle housed in your garage, so make sure you include electrical wiring for a suitably sized spare power point in a location that can be used as a future electric vehicle charging point. Also, consider whether you are likely to own your car in the future – would you be better off with a single car garage and a future carport if required, rather than a double garage?

Checklist: Our budget

What are the unknown costs we should allow extra money for, such as more excavation for hitting rock?

What are the items that we should make sure are costed in, for example quality double glazed windows?

Should we save on energy supply charges by going all electric?

Can we upgrade the hot water service to a heat pump?

Can we upgrade to an induction hotplate?

Should we install a PV-powered system and battery now or later, and what sized system should we plan for?

Will the bedrooms be able to be adjusted in the future to suit adult children or aging parents?

Our future-proof 'must haves':

Tips:

Don't over-commit with finance - plan for some items, which can easily be delayed, to be installed later.

Budget for all costs involved - don't forget the legal costs, stamp duty, removalist fees, etc.

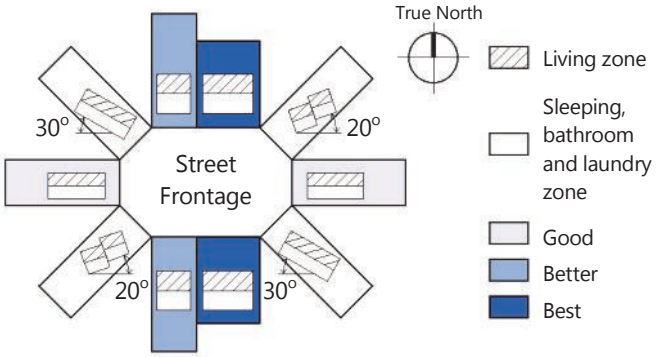
Insure the property prior to exchanging contracts and consider taking out 'mortgage insurance' to the total of your debt – this will make sure that if anything should happen to you, your debt will be repaid and your dependents' future secured.

Cool roof, cool house

As the climate warms it's important to think about keeping your home cool. Whatever material you are using, select a light colour roof and cladding. Dark colours will heat your home and the area around your home, and will only help in winter if you have no insulation. By insulating the ceiling and walls your home will be kept at a comfortable temperature and by using light colours, the areas around your home will be cooler. When choosing light colours, do be mindful of glare to neighbouring properties.

Cool room

Have at least one living space with a ceiling fan that can keep you cool in long stretches of extreme hot weather. This can also be an occasional spot to sleep at night when the temperatures are high. Also think about having a space that stays cool throughout the year without the need for mechanical cooling, by using shading, thermal mass (a material that absorbs and stores heat and energy – refer page 14) and capturing breezes. This space can be used if the mains power goes out for any extended time.



Choose where to live

Location

You have the opportunity to maximise your investment by choosing a block that's close to everything you need and well-connected to public transport. This helps to protect you from rising petrol prices and increased traffic congestion. Being able to walk or cycle to shops, schools and public transport not only makes life easier, but healthier too. A better location might mean a smaller block – or even a different style of home – but maybe it's worth it when you think about everyday travel times and convenience.

Orientation

The way your block and house faces is the most critical decision you will make when buying a block for your new home or buying an existing home. When you're looking at different blocks or existing houses, consider how you could position the home or rooms so that it's naturally warm in winter and cool in summer.

While all blocks have a north point somewhere, it is best if the north point is fairly close to aligning directly to one of the side boundaries. It also pays to look for blocks with good access to cooling breezes, especially in warm climates.

Always try to have north to the widest boundary. If you have north to the rear of the block, look for a wide rather than a thin block and remember to pick a house design that is at least 1.5 times longer on the north side than the east or west side.

With blocks getting smaller and the possibility of a two storey house next door, the best orientation is to have your rear boundary facing within 5 degrees west or 15 degrees east of true north (see image above). This will give you total control over your winter sun.

Next best is north to the street, but remember, you don't want your garage taking up over a third of your possible winter sun. In this case, choose a design where you can detach the garage and make a sunny north courtyard between the garage and living area.

While there are options that can go some way to adjust for a poorly orientated block, it is always easier to make an informed decision at the start and get your block orientation as close to perfect as you can.

If you are looking at buying an existing home and the living areas are not facing north, consider whether the layout of the house or windows could be adjusted to easily allow the living areas to face north.

No matter which way your block faces you can still get a good outcome – just as long as you choose a suitable home design. This is explained further over the page – 'Find the best fit'. However, choosing a block with good orientation from the start can make it easier and cheaper.

True North

It is important to establish where 'true north' or 'solar north' is on your block. Most maps are drawn to magnetic north, which is what a compass shows. While this is a good indicator, it needs to be adjusted to get the best orientation for your house.

The adjustment figure for true north changes across the country. In Australia's eastern states, true north can be from 10-14 degrees west of magnetic north. In south west of Western Australia it is the opposite and can be 2-4 degrees to the east.

Finding true north is useful in all climates to capture or keep out the sun. Use a compass or your mobile phone to establish magnetic north and then find true north by adding or subtracting the 'magnetic variation' for your area using the map in *Your Home* or www.ga.gov.au/oracle/geomag/agrfform.jsp.

Choosing the right block

When looking at blocks in a new estate, be aware that the cheaper blocks may end up being more expensive to build on. Cheaper blocks may have a slope that increases building costs, or be an irregular shape or size that makes it difficult to place a standard house plan on. Sloping blocks, or blocks that have easements or covenants (restrictions), may result in higher building costs, or be worth less than neighbouring properties in the future.

If a block is more expensive it may be because it has good orientation, is level and easy to build on, has good access to shopping centres, schools, public transport, parks and bike paths – all of which should add value to your home in the future.

Buying 'off the plan'

If you are buying land or an apartment "off-the-plan", it means your new block or apartment does not exist at the time when you sign the sales contract.

If you are buying land "off-the-plan", you should be careful signing a contract with a builder before you have the final title for your block of land. Most building contracts have financial penalty clauses for any delays that may happen, and although land sales staff may be optimistic about when approvals and site works will be completed, delays of months and in some cases years is not uncommon. This could end up costing you quite a bit of money before the building even begins!

If you are buying an apartment "off-the-plan", remember they too can have delays. Factor in for your move-in date to be delayed and for your lease or settlement date to be extended.

Checklist: Our location

Suburbs or estates our family are considering:

Will we be able to walk or cycle to everything we need – shops, schools, parks, public transport, etc.?

Our location 'must haves':

Best location for us would be:

Will we be able to position a home on our block so it has good access to sun, ideally with the long side or back facing true north (or close to true north)?

Will any neighbouring buildings have an effect on our blocks' privacy, views or access to winter sun?

Best block for us:

Tip:

Check the bus and train routes near your preferred location – how long will it take to walk to the nearest bus stop or train station?

Smart tips

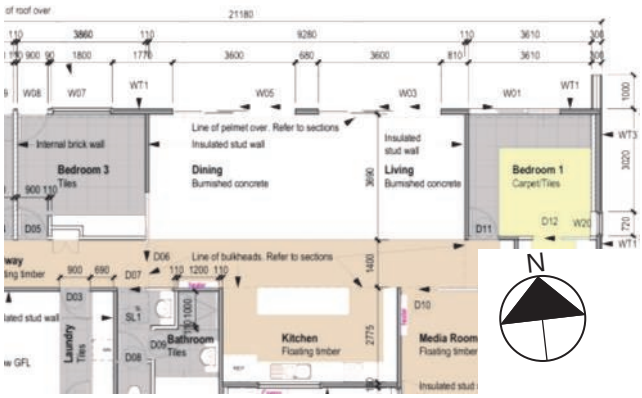
Spend less time stuck in traffic and more time enjoying life. Being able to walk or cycle to shops, schools, parks and public transport not only makes life easier, but healthier for you and the environment too. Consider these factors when you are choosing the location of your new house block, apartment or existing home.

Find out more

Your Home sections:

- Before you begin
- Choosing a site
- Challenging sites
- Passive Design
- Design for climate
- Orientation

www.yourhome.gov.au



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step 12

Choose your home

Know the rules

Find out the requirements for homes at your chosen location by checking with your Expert and local council/authority.

If you plan to build new or do a major renovation, you will need to comply with minimum standards in the National Construction Code as well as other state and territory requirements. For example, in the ACT there are also solar access provisions and mandatory water efficiency requirements.

If buying into an estate you may need to meet requirements made by the developer. These are often called estate 'design guidelines' or 'covenants', and may cover types of building materials, facade style and fences.

For environmental reasons some estates may have a cat containment or 'no dogs' rule. If you think this rule may impact you now, or in the future, then consider looking elsewhere.

If you are buying an existing home, you can ask for information about the property, such as condition reports, owners corporation fees, etc. In the ACT you can also request their mandatory disclosure energy efficiency report.

'We discovered it's about more than square metre cost... our home is compact and sunny in winter with spaces that work.'

Floor plan

Looking at Experts' floor plans or existing house plans is where you can start to compare your 'must haves' and 'wish list' with what's on offer. You can make choices based on how many square metres you can get for your money, but there's much more to a good investment.

Think carefully about what you really need. It's tempting to want more area for your money, but bigger isn't always better – you'll have less garden area and more house to heat, cool, light, clean and furnish. This adds to your costs both now and into the future. Good design that doesn't waste space feels great to live in and holds its value better.

Find the best fit

Make sure the homes you're considering will fit well on your block. Check the width of the home frontage and any setback requirements – the distances you have to leave between your home and your site boundaries. Your Expert should be able to help you with this.

If looking at existing homes, consider whether you will want to extend in the future and whether there is enough space on the block to do this.

Choosing a floor plan that faces the right way on your block will make your home more comfortable, and you won't need to spend as much on heating, cooling and lighting.

Smart Tips

The **north side is warmer in winter** and the best place for rooms you use a lot, like living areas.

The **west side gets hot in the afternoon** and is best for rooms you don't use often, like garages, bathrooms and laundries.

The **south side is the coolest** and good for bedrooms in warmer climates, as well as rooms you don't use often.

The **east side gets morning sun** and is good for breakfast rooms, kitchens and bedrooms.

If you can't get an ideal position for every room, you can still have an energy saving home. You'll just need to pay more attention to the design and appliances, which might cost a little more upfront. Good position on the block gives you a head-start and makes the rest easier, so lock it in if you can!

Here are some tips for positioning your living areas:

- If the front of your block faces south, place living areas at the rear of your home – an easy solution!
- If the front of your block faces east or west, place living areas on the north side of your block.
- If the front of your block faces north, place your living areas at the front of your home with windows to the north that look out onto a sunny front courtyard or garden. Make sure you don't let your garage be the warmest winter spot in your home!

If you have a sloping block, think about which home would make the best fit with minimum excavation and drainage costs. Discuss this with your Expert and ask them to suggest a suitable home design.

Check with your Expert that the position of your home and location of windows will maintain privacy for you and your neighbours. Keep bedrooms away from noisy areas like driveways or neighbours' living areas. Be especially mindful of this if you are buying an apartment. Now is also a good time to think about where you'll put cost saving features like an outdoor clothesline and a rainwater tank.

Face living areas north

North is the best position for rooms you spend a lot of time in, because north-facing rooms get sun for the longest part of the day. With the right sized eaves, north windows are also easy to shade from unwanted sun in summer when the sun is high, and still let in sun under the eaves in winter when the sun is lower.

If it looks like your living areas won't get good sunlight, ask your Expert if you can flip or rotate the plan for better positioning on the site, make minor adjustments to the plan, or pick another plan.

Checklist: Our home

Homes our family are considering:

Our preferred home:

Is it a functional and not over-sized floor plan, without wasted space and with plenty of storage?

What would we change about this plan?

Can we avoid the expense of air conditioning by using natural ventilation, shading and ceiling fans instead?

Will our preferred home fit well on our block with living areas facing north (or close to north)?

Tips:

Find out from your local council/authority if there are incentive schemes available for PV-power, battery and energy efficiency improvements.

Talk to your Expert about making no cost or low cost changes – for example, can you flip or rotate the plan?

If you have a steeply sloping block, choose a split-level or raised floor design.

Consider features that make your home safe and easy to live in as you get older.

Consider whether you need a spare bedroom or whether a living space or existing bedroom could be used for guests.

A home for life

You might be planning to live in this home for a long time, so ask for features that will make your home a safe and easy place to live as you grow older, like entries and showers without steps, and avoiding steep driveways.

These features make good sense anyway and come in handy when you have small children, or elderly or less mobile visitors. They could also make your home attractive to a wider range of people when it comes time to sell.

Find out more

Your Home sections:

Passive Design
Design for climate
Orientation
Housing of the future
Livable and adaptable house
Safety and security

www.yourhome.gov.au

Choose your home

Aim for the stars

Your home's Nationwide House Energy Rating Scheme (NatHERS) star rating indicates how comfortable your home will be and how much you're likely to save on heating and cooling bills. The star rating scale goes up to 10 stars (NSW homes require a Building Sustainability Index (BASIX) score with most also getting a NatHERS star rating). In many states and territories new homes are required to be at least 6 stars, but home buyers can ask for 7 stars or more – an indication of good, energy saving design.

Upgrading to a higher star rated home can reduce heating and cooling costs – the lower your energy bills are, the easier your mortgage payments will be. A high star rating can also improve the resale value of your home. Discuss with your Expert about working together with their energy rater to try to achieve a higher than minimum star rating for the home – why not aim for 7 or 7.5 stars?

The NatHERS star rating is focused on the building 'shell' – building materials, insulation, windows – as well as how your home is orientated on your block. You can get a good star rating with almost any house style, but some styles work better than others. The key is selecting a block with a good 'true north' orientation and maximizing your living areas on the north side of the block.

Eaves work wonders

A roof with eaves of at least 450mm or greater is a cheap and effective way to help keep your home cool in summer. The eaves help shade walls and windows from high-angle summer sun. Eaves of 600-900mm work particularly well on the north side with windows up to 2.1m high, providing effective summer shading and letting in winter sun without you having to do a thing. This happens because winter sun is at a lower angle than summer sun and comes in under the eaves. Eaves can also help with waterproofing and can stop paint from cracking and fading in the sun.

Insulation is a wise investment

Although you don't see it, you'll feel the impact of good insulation every day. Your home will be quieter and more comfortable to live in, plus you'll save money on energy bills. Talk to your Expert about increasing the amount of insulation in your home.

The right level of insulation for your home depends on the climate, but generally the more the better. Make sure you have reflective insulation under a tiled roof, or a combined foil/insulation product under a metal deck roof, as well as bulk insulation like batts above the ceiling, in the walls and if appropriate under the floor. The higher the 'R value' the better the insulation.

'We paid extra for insulation and removed downlights in the ceiling – it was worth every cent!'

Build better than minimum

Home building contributes to some of Australia's biggest environmental problems and building regulations can be slow to change. The regulations are a minimum requirement and vary depending on where you live, but one thing is certain: **homes of the future will need to get better at saving energy and resources as costs continue to rise**. It pays to think about this now and build better than the minimum!

Outdoor living spaces

You can use outdoor space as an extension of your living room, effectively getting more space for free! Take care with shading – the amount and type you need varies depending on your climate. See if you can use shading to keep unwanted sunlight out of the house in summer, but make sure you allow sunlight inside during winter. If you have young children, design kitchens and living areas to overlook play areas.

Glass has an impact on bills

Many Australian homes have windows that are too large or simply have too many windows. Glass is the 'path of least resistance' for losing or letting in heat, so don't go overboard, as windows can have big impacts on your heating and cooling costs.

Up to 40% of a home's heating energy can be lost through windows and up to 87% of its heat can be gained. If you don't choose the right window size and type of glass, your home may feel like a sauna in summer and an igloo in winter.

The way the sun moves across the sky means some places are better for glass than others – glass facing north is ideal because you get lots of winter sun and all you need are eaves to shade it in summer. Glass facing east or west can overheat in summer and needs adjustable vertical external shading like shutters or louvres – deep shade pergolas can also work well in some cases. Glass facing south doesn't get much sun and can make your home feel cold in winter.

If you live in a cold or temperate climate, consider high performing windows with a low U-value and high solar heat gain coefficient (SHGC), such as good quality double glazing. This will let the heat from the sun in while stopping the heat from inside the home from escaping, making your home more comfortable. Curtains and pelmets also help to keep warmth in.

If you live in a warmer climate, consider reflective or tinted glass with a low SHGC – this will keep heat out.

Windows that open up wide make it easy to capture cooling breezes, while flyscreens, security screens and windows that lock when partly open allow you to let breezes in, keep out insects and keep the house secure.

Checklist: Our home

The star rating of our home will be: (7 stars or more?)

Have we included the best insulation under roofs, in ceilings and in walls? Do we need floor insulation?

Are our north-facing windows facing the ideal location and shaded by eaves or overhangs that are deep enough?

Are our east and west-facing windows shaded by adjustable shutters?

Do we need high-performance glass or double glazing?

Will we use curtains with pelmets to help keep in heat?

Comments, things we'd like to change about our home design:

Tips

Add extra doors to close off rooms to reduce your heating and cooling costs.

Check if your ceilings will be high enough to have ceiling fans – this can help save your energy costs.

If you have views to the west, east or south, use small picture windows to capture the view while minimising unwanted heat loss or gain.

Limit the holes and pipes going through your ceiling, to make sure your ceiling insulation has maximum coverage.

If you choose a style without eaves, include adjustable external window covers to keep your home cool in summer.

Make sure your Expert includes sarking under the roofing – this material reflects heat and provides water resistance.

Retrofitting existing homes

It's often difficult to improve existing homes, especially adding wall insulation. However, adding draft proofing and topping up or replacing ceiling insulation can be much easier. If you have downlights, replace them with pendant lights and repair the ceiling, as this will allow you to re-install the missing insulation in the ceiling. You could also improve your appliances and add shading, double-glazed windows and good curtains with pelmets.

Find out more

Your Home sections:

- Passive design
- Design for climate
- Orientation
- Shading
- Passive solar heating
- Passive cooling
- Glazing
- Insulation

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Work with your Expert

Living areas

Living areas are one of the most used parts of your home, so it deserves some extra-special attention.

It's a good idea to face living areas north or close to north if you can. This way you'll get loads of winter sun and easy shade in summer if you have eaves. Anything within the range of 5 degrees west to 15 degrees east of true north is good (but within 20 degrees west and 30 degrees east of true north is still workable). In tropical climates you're best off facing living areas to capture cooling breezes and have deep eaves.

Open plan living is popular and can create a wonderful flow of space. But when living areas are too open, especially if they have a loft space or high ceiling, they can be difficult (and costly) to heat and cool. They can also be noisy. Choose a design that gives you the flexibility to open up or divide up the space as you need.

Clever design of space is crucial in a living area. It's the feeling of spaciousness rather than the amount of space that matters most – and how well the spaces function. Look for practical, well designed areas that use space cleverly and don't waste it. You could also talk to your Expert about modifications that allow you to use space flexibly and make heating or cooling easier, like room dividers or sliding partitions. This way you can adapt space to suit your family's changing needs.

To keep living areas cool in summer, make sure you have windows or openings on more than one side of the living area. This allows cool breezes to flow through.

High openable windows work well to get rid of hot air as it rises, for example in stairwells, and be secure if left open overnight to cool the house. Just make sure they can be closed in winter and the frames have good weather seals. Double glazing will also help to keep heat in during winter and heat out during summer – this is particularly handy in climates with cool or cold winters.

If a feature you liked in a display home was the 2.7m high ceiling or higher, make sure this is a feature you add to your home rather than the standard 2.4m height. However this can make heating and cooling your home more costly, so consider restricting the high ceilings to the living areas.

'We put in two extra doors, making our living areas easier to heat and cool. This also helps keep the house quiet when the baby is sleeping.'

Reverse brick veneer

Reverse brick veneer puts the brickwork or blockwork on the inside wall of your home. Bringing your bricks inside and putting insulation in the wall behind, makes the most of the thermal mass of the bricks to moderate the temperatures inside your home.

This can give you a higher performing home than standard brick veneer and save you energy in both winter and summer.

Talk to your Expert about including one or more feature brick walls inside your home with a light-weight cladding on the outside.

Thermal mass

Concrete, bricks and tiles all have the ability to store energy and are called thermal mass. Combined with good solar passive design, these materials have the ability to moderate the internal temperature of a home.

If you have a concrete slab, north facing glass into living areas and appropriate eaves, then you are on your way to having a comfortable house in all seasons.

Just remember that a burnished, polished or tiled slab will only be of benefit on the north if it is not covered by carpet or timber, which acts as an insulator and stops it soaking up heat from the sun. If you want these coverings, use them on the south side of the house and choose rugs on the north side to make the most of the benefits of the thermal mass.

The bricks used on the outside of a house are also of no thermal mass benefit for internal room temperatures and only act as a rain barrier. Explore using reverse-brick veneer options, or replace some of the external walls with a light weight cladding and use these bricks instead for thermal mass inside the house – either as a feature wall between a living area and bedroom or just a feature wall in the main north facing living area.

Even homes using light weight floors on a sloping site can have at least one brick wall incorporated into their living area in a logical spot to create internal thermal mass.

Home office

If you work from home a lot, try to provide your home office with a pleasant north-facing aspect – you'll want it to be comfortable all day.

Checklist: Our living areas and home office

The living areas we need are:

Can our living areas be opened up or closed as needed, for economical heating and cooling?

Will our living areas get plenty of sunlight in winter?

Will our living areas be shaded in summer?

Can windows be opened on more than one side of living areas to let cooling breezes through?

Comments, things we'd like to change:

Will we use the home office a lot?

Will it be a sunny, pleasant place to work?

Comments, things we'd like to change:

Tips:

Add extra doors between areas to allow them to be zoned. This will help reduce heating and cooling.

If using a burnished or polished concrete floor, make sure it is primed and sealed with a natural oil sealer.

Greening concrete

An adaptable, well designed house has the potential to be in place from 40 to 100 years. One of the most environmentally expensive parts of the home is the concrete slab, even if it lasts a long time. Check with your Expert if they use concrete that has a large percentage of recycled content or if they use geopolymers or graphene to replace some of the cement. Cement has a high impact on the environment.

Find out more

Your Home sections:

- Passive design
- Orientation
- Passive solar heating
- Passive cooling
- Thermal mass
- Materials
- Livable and adaptable house

www.yourhome.gov.au

Work with your Expert

Kitchen

Kitchens are said to be the heart of the home where everything happens. It's often the kitchen and living areas that people focus on and that's important if you're thinking about resale value. A well designed, functional kitchen can really add value to your home. A good kitchen gives you room to move, but is compact enough to allow easy reach between different activities, like preparing food, cooking and rinsing. It's a good idea to leave generous bench space between the sink and the cooktop as this tends to be the most useful space for food preparation.

Locate dishwashers close to sinks to allow easy loading – this also concentrates your plumbing needs in one place and saves money.

Multi-bin sorters under kitchen sinks are a great idea – you can separate your rubbish for recycling and your food-scraps for composting.

A fridge typically uses more energy in a year than any other appliance. It's responsible for about 13% of the average family's electricity bill. It pays to buy an efficient and appropriately sized fridge – see page 21 for some handy hints. Make sure kitchen cabinets allow a decent air gap around the fridge (especially at the back) as it needs good ventilation to work efficiently.

Also, think about your kitchen finishes. Expensive items such as stone or recycled timber benchtops could be saved for later updates and free up some of your money at the initial building stage to install better insulation and glazing, or higher ceilings in the living area, which are expensive or impossible to retrofit later.

Bathroom and laundry

Take the opportunity to add value to your home and save lots of water in bathrooms and laundries by installing water saving fixtures and fittings. Your plumbing fixtures will last a long time so it pays to get the best standard of water saving fittings and tapware.

There's a trend towards multiple bathrooms in new homes, but it's worth thinking about the extra costs and cleaning before you add bathroom number three to your 'wish list'! Remember each extra toilet will cost hundreds of dollars now, and even more over the life of your home.

Consider putting extra stud framing in next to your toilet and in your shower for grab rails – this will ensure your home can easily be adjusted in the future if needed.

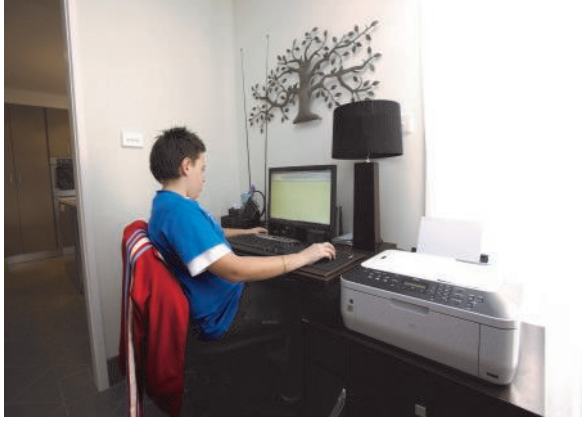
'Getting our designer to make a few changes to the plan was the best thing we ever did.'

A good kitchen is a healthy kitchen

This is about more than the food you eat! Most kitchen cabinets contain glues and varnishes that give off fumes, particularly when they are newly installed. These can cause breathing irritations and allergies. 'Low-emission' materials provide a much healthier alternative – ask your kitchen designer or see the healthy home section in *Your Home*.

Sealing your home

The best time to correctly air seal your home is while it's being built. Talk to your Expert about what it would cost to put extra time and care into: taping the joints of the building wraps; sealing the wall-ceiling, wall-floor junctions, window and door frames; and taping or using special seals around plumbing pipes and electrical wires where they penetrate the sarking or moisture control fabric. Also, make sure your Expert takes photos before it's covered up so you know it's been done properly.



You can save money on plumbing by choosing a plan that groups wet areas like the kitchen, laundry and bathrooms close together.

If you have a number of bedrooms sharing a bathroom, it's a good idea to have a separate toilet, so the shower and toilet can be used at the same time.

Having windows that open to ventilate bathrooms and laundries will help any exhaust fan and give your rooms a light, airy feel – and save you electricity.

Position the bathroom exhaust fan above or near the shower, as this will best capture moisture created in the room. Make sure your exhaust fan vents directly to the outside and not into the roof space, as this will avoid unwanted moisture in your roof space.

After you've locked in good savings with water efficient fittings, you might want to go further by installing a rainwater tank and connecting it to your laundry and toilets.

Bedrooms

The southern side of the house is the coolest and usually good for bedrooms. The eastern side gets morning sun and this can also be a nice aspect, though you'll need shading if you want to sleep in!

Avoid bedrooms facing west if you can, as they heat up in the afternoon and can be uncomfortable on a summer night. If you can't avoid west-facing bedrooms don't worry, they can still be comfortable, you'll just need to pay better attention to external shading and insulation.

Because heat rises, upper level bedrooms can get particularly hot. Consider openable windows and how these rooms can be cross-ventilated.

Checklist: Our kitchen, bathrooms, laundry and bedrooms

Is our kitchen set out so there is easy reach between different activities?

Comments, things we'd like to change:

Will our bathrooms and laundry have a window for natural ventilation?

Comments, things we'd like to change:

Can we swap some rooms around so the bedrooms will be cooler in summer?

Are the bedrooms big enough to accommodate a future study desk, independent students or aging parents?

Comments, things we'd like to change:

Tips:

Before signing a contract with a builder, refer to the supplementary checklist 'Before signing a contract and building'.

It is standard for many builders to use a chemical barrier for termite protection. While it may cost a little extra, consider using stainless steel mesh barriers instead and add this to your building contract, as these are better for the environment.

Smart tips

Make sure that any household activities that create water vapour, such as showering, washing, cooking or clothes drying, is vented directly to the outside of the house by using self-closing extractor fans.

Do not vent fans into the roof space, as this can encourage mould, mildew and decay of the timbers.

Find out more

Your Home sections:

Energy
Orientation
Passive solar heating
Passive cooling
Water
Reducing water demand
Livable and adaptable house
The healthy home

www.yourhome.gov.au

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Select heating & cooling

Hot water system

Water heating is responsible for more than 25% of the average home's energy bills and greenhouse gas emissions.

The first step to using less hot water is by installing water efficient showerheads and taps. This will save both energy and water.

Choosing an efficient hot water system is your chance to save money, add value to your home and do your bit for the environment. It can also help you meet local council/authority or state and territory regulations. It may cost you more upfront, but usually pays for itself within a few years through energy savings.

The best choice and size of hot water system depends on a few things, like how much water your household uses and how many people are likely to be regularly in your home.

Look for the appliance with a high number of small-scale technology certificates (STC) for your area and get the most out of your efficient hot water system by:

- Installing a heat-pump or PV-powered hot water system.
- Locating your hot water system close to where you'll use it, near the bathroom, laundry and kitchen.
- Installing a high-rated showerhead.

Space heating and cooling

Many of the tips in this Guide can help make your home more comfortable all year round so you won't need to spend much (or perhaps anything!) on heaters or air conditioners. If you do install heating or cooling, you can save money while keeping comfortable by:

- installing ceiling fans and using fans instead of the air conditioner
- only heating or cooling the rooms you need, and making sure the heating and cooling is zoned so you can switch different areas on and off
- checking your thermostat settings to avoid overheating or overcooling
- making sure the systems are the right size for your needs – oversized or undersized systems waste money both upfront and in running costs
- making sure your heater or reverse cycle air-conditioner has a high star rating and is suited to the climate, and
- reducing the number of holes in your ceiling insulation by removing downlights and using pendant lighting instead.

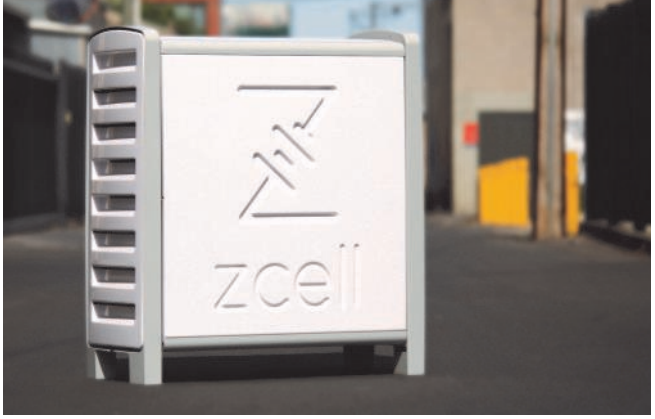
'We picked a heat pump hot water system because it is efficient and we can run it for free off our PV panels when we add them in the future.'

Did you know?

International experts predict that climate change will dramatically increase the cost of electricity, gas, petrol and water in the future. Get ahead by choosing a home that helps you save on these now and has the best resale features. In a few years, home purchasers are likely to expect highly energy efficient hot water, heating and cooling systems as a standard feature.

Air conditioning is more efficient if the right sized individual reverse-cycle systems are used instead of a ducted system.

Hydronic heating can be an efficient way of heating your home if it uses a heat-pump system. Hydronic wall heaters give off radiant heat, which is a much more comfortable heat than other heating types. The wall heaters are also more responsive than in-slab heating, which are slow to respond to changing weather.



Solar power and batteries

The term 'solar panels' can mean two different things:

- collector panels for your solar hot water system, or
- photovoltaic (PV) panels that convert sunlight into electricity.

They're both capturing the sun's energy – one to heat water, the other one to make electricity.

With the price of PV panels and batteries continuing to fall, it is a good idea to either install a system when you build or renovate, or at least make sure you have enough north or west facing unshaded roof space for panels to be installed in the future.

When you are installing PV panels, the best value for the power you produce is to first use the power for your own needs in the house, before you export excess power to the grid. Talk to a PV panel provider about using your system to run your heat pump hot water service, and your reverse cycle air conditioner. This feature would also be useful if power from the grid stops for a few days during an extreme heatwave.

Batteries are also becoming more affordable. If you are planning on installing PV panels and are going to wait to install a battery in the future, make sure you set your system up at the outset to use your heat pump hot water system like a battery to store the power you produce in the form of hot water.

In cooler areas and subject to manufacturer's advice, you may also be able to use a quality heat pump hot water system to run a small number of hydronic heaters in your home in winter, as well as your hot water service. Check with your provider and installer if this will be possible.

Checklist: Our heating and cooling

Do we have a north-facing roof for solar hot water or PV panels?

Type of hot water system we're looking for:

What other good design features (such as extra insulation) could we lock in to avoid or reduce our energy bills?

Can we use fans and/or does our air conditioner have a high star rating for both heating and cooling?

How can we save further on heating and cooling?

Will we use electricity from our PV panels in our home before exporting any excess to the grid?

Comments, things we would like to change:

Tips:

Avoid in-slab heating and consider fans instead of air conditioning.

If you're planning to use an air conditioner for heating and cooling, choose one with a high star rating.

If you're planning on central heating or air conditioning make sure it's zoned and not oversized.

The compressor unit of an air conditioner can be noisy so think carefully about where to locate it.

In-slab heating is a comfortable way to heat your home, as there is no sound or air movement and it gives an even warmth to the room. However, in-slab heating is hard to fix if anything is not working, it uses a lot of energy to heat the slab (this is not so bad if it is heated at off-peak times or from PV-power, but is much less efficient than other options), it can take days to heat up or cool down and if covered by timber, carpet or rugs, it will not work as effectively. Wall mounted hydronic heaters provide greater flexibility and are easier to maintain.

Find out more

Your Home sections:

- Energy
- Heating and cooling
- Hot water service
- Photovoltaic systems
- Home automation
- Batteries and inverters

www.yourhome.gov.au

STCs: www.energy.gov.au/rebates

Select fittings & appliances

Lighting

Lighting is responsible for 10% of the average family's electricity bills, but in some homes this can be much higher. You could be wasting hundreds of dollars a year just lighting your home.

Of course the cheapest solution is to maximise use of natural light. This is another good reason for following the design tips in this Guide about placement of rooms and windows.

Choosing energy saving lighting is one of the easiest and most cost effective things you can do. Compact fluorescent lights (CFLs) save energy (remember to choose 'warm white' bulbs for a nice warm feel), while many light-emitting diode (LED) lights save as much energy as CFLs and can last three times longer or more. LED lights are improving in quality and getting cheaper.

Low voltage halogen downlights use more energy than these efficient types and they can be a fire hazard as they get very hot. New halogen lighting will be banned from 2020.

'We changed our lighting plan when we found out downlights would make our ceiling insulation so ineffective.'

Ditch those downlights

When downlights are installed you generally need more downlights to give the same amount of light as one standard light and it is common for half an insulation batt to be removed to accommodate the fitting. This leaves your ceiling with a large number of areas without insulation, which lets the warm air flow out in winter and the hot air to enter in summer.

There are some newer types of sealed LED downlight units certified by the manufacturer to meet Australian Standards that allow insulation to be installed over the top of them. However, your insulation installer and electrician will need to know the difference between the fitting types, understand the electrical code and be careful to make sure the downlight is the right type.

Also, a sealed downlight unit can't have the bulb replaced when it wears out – the whole unit has to be thrown away. Like other bulbs these cannot currently be recycled or put into your household garbage, and the additional material being thrown away is less sustainable than replacing only the bulb.

Your Expert may suggest using downlights because they are cheap to install and they make a low ceiling look higher. If you want a higher ceiling, price that into your design at the beginning and take the time to walk through a lighting showroom – there are lots of light options that look great and won't make your ceiling insulation potentially have holes like swiss-cheese!

Smart Tips

- Put an on/off switch for your stove, microwave and TV in an easy to access location to avoid paying for stand-by power.
- Set up your garage with an extra power 15 amp point for a future electric vehicle.
- Put enough light switches in your living areas and kitchen so you can turn on one or two lights at a time.

Look for the stars

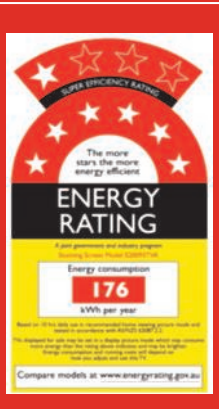
The biggest energy users inside a home are the:

– heater/cooler

– hot water

– fridge

Look for the energy star label – the more stars, the better energy savings.



Appliances

A smart choice is one that continues to save you energy and money for the life of the appliance. The questions to ask are:

- What size do I need?
- Does it have a high star rating?

Star ratings are provided on all white goods to help you make the best choice. There are star ratings for both energy and water so a washing machine, for example, will have a star rating label for energy use and another for water use. The more stars, the more efficient the appliance is.

Choosing the right size for your needs is also important – a big 4-star fridge uses more energy than a small 4- star fridge. Look for the actual estimates of energy and water use also provided on the label. This will give you a sense of the relative cost of running the appliance. The fridge uses the most energy each year and the washing machine uses the most water each year.

It's worth considering these issues for your other appliances too – they all contribute to your bills! If you're choosing home entertainment equipment it pays to compare energy use – both when in use and when in 'standby' mode. Some products can use more than three times the energy of others.

It's worth asking about energy use when making a purchase, because your choice could end up saving you hundreds of dollars in electricity bills.

Checklist: Our fittings and appliances

Does our home design make good use of natural light?

Our lighting requirements are:

Ways we can save on lighting costs are:

Have we chosen fixtures that will save water? For example, do our bathrooms and laundries have 3-star showerheads, 4-star toilets and 3+ star taps?

The energy star rating of our fridge is:

The water star rating of our washing machine is:

Our other major energy-using appliances are:

Tips:

Don't use downlights. Lighting a room with many energy saving downlights can use more energy than a single efficient light, and put holes in your ceiling insulation.

Install an outdoor clothesline – let the sun dry your clothes for free instead of paying to run a clothes dryer.

Find the best products

These websites can help you find the products with the best star ratings:

Water star ratings

- www.waterrating.gov.au

Energy star ratings

- www.energyrating.gov.au

Find out more

Your Home sections:

Energy
Heating and cooling
Hot water service
Lighting
Appliances
Photovoltaic systems
Home automation
Reducing water demand

www.yourhome.gov.au

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Select colours & finishes

Flooring

Burnished or polished concrete can help keep indoor temperatures comfortable by storing heat from the sun – find out more about this in the *Your Home* Thermal mass section.

Tiled surfaces, and burnished or polished concrete, give a sleek modern look and work well in high-traffic areas. Make sure to choose slip-resistant surfaces in wet areas, such as bathrooms and laundries.

Timber, tiled or marmoleum surfaces are low maintenance and easy to clean. For allergy sufferers they're also a healthier alternative to carpet, which can trap dust and other allergy-causing particles. If you want the cosy feel that carpet provides, you could consider rugs that you can wash or air outside.

A wool, wool/bamboo blend or sisal carpet gives a warmth to south facing bedrooms and are best used in areas that are not getting direct sun.

'When we painted our old place you could smell the paint for weeks. We're so glad we went with low emission paints this time.'

If you use timber, make sure it comes from certified sustainably managed forests. There are plenty of cost effective and stylish Australian timbers from these sources, so here's your chance to do the right thing by the environment and choose a product both sourced and made in Australia, without compromising on style.

You can get natural varnishes for timber floors, like tung oil or beeswax, that look great and don't give off low level toxic fumes like standard polyurethane finishes do. Ask your Expert if they can use a natural product for your floors.

Healthier paints

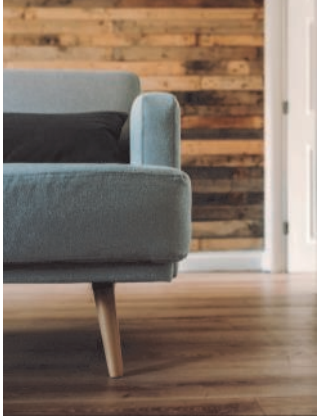
Regular paints give off low level toxic fumes that can cause breathing irritations and headaches. Painted surfaces can continue 'off gassing' fumes for months after painting. The good news is that many paint companies now offer healthier low emission products for the same cost. These are also known as 'low VOC' (volatile organic compounds) products.

If you want to avoid paint fumes altogether, look for paints that contain all-natural ingredients. These cost more, but are worth it if you have allergies or young children.

Smart tips

- Use natural paints in nurseries and bedrooms of allergy sufferers.
- Use low emission paints for all light-coloured surfaces, and use natural paints for darker coloured feature walls – the most cost effective way to minimise emissions!
- Good natural ventilation in your home helps reduce the effect of paint fumes.

Important to know: Adding colour pigments to a low emission light-coloured paint base usually increases the emissions – check with your Expert or paint supplier.




Paint colours

Ideally interior paint colours should be the last thing you choose after cabinets, carpets and floor tiles. This is because there are so many paint colours to choose from, but far less selection with other finishes.

White paints have different bases – yellow, pink, fawn and grey – and it's important you follow the 'family colour' throughout, so that your paint selection has the same base as your tiles and cabinets.

Using light-coloured interior paints improves daylight levels inside your home. As well as creating a light and airy feel, you're unlikely to need lights on during the day, which saves money.

Sleek contemporary kitchens are achieved with plain cabinet doors without panelling. White laminates and timbers go well with this look. If you prefer the traditional look, this can be achieved with warm colours and panelling on cupboard doors. Remember that bright, dominating colours in permanent kitchen fixtures can be expensive to change if you tire of the colour. Think about using wall paints or decorative display pieces instead – they can also provide any bright accents you may want.

Your exterior colour scheme can actually have an impact on indoor comfort too. Light-coloured walls and roofs reflect heat and can help to keep your home cool in summer. The roof colour and outside paving colours make the most difference, as they usually get more direct sun than any other part of the house. It's best to choose light colours for these surfaces.

Checklist: Our colours and finishes

The types of flooring in our home will be:

The timbers used in our home will be:

Do our kitchen and laundry cupboards use low emission particle board and finishes?

Will the paints and varnishes used in our home be healthy?

Have we specified materials that are either low emission or natural products?

Examples of colour schemes that we like are:

Tips:

Make sure timber used in your home comes from certified sustainably managed forests – check with suppliers that the timber boards are both sourced and made in Australia.

Consider alternative options like recycled timber flooring – these are stylish, durable and environmentally friendly.

Check that cupboards, floor finishes, paints and varnishes are either natural or low emission products.

If you use predominantly light, neutral colours in permanent finishes like tiles, you can use colour accents in features that are easier to change, like painted walls.

Toxic fumes

It's not just paints and varnishes that can give off low level toxic fumes – so can many common materials like carpets and kitchen cabinets.

This is due to the presence of 'volatile organic compounds' (VOCs). The good news is that many healthier no or low VOC alternatives are available.

Find out more

Your Home sections:

Materials

Embodied energy

Thermal mass

The healthy home

www.yourhome.gov.au

Select outdoor areas

Outdoor living spaces

Your garden and outdoor areas are an extension of your home. The best living spaces are those which flow from inside to outside, so you can make the most of alfresco living. You can also use clever landscape design to:

- channel cooling breezes into your home, or
- shelter indoor and outdoor areas from winds.

Consider the outdoor living area, barbeque location and areas for fruit trees, chooks, space for a herb garden and a sunny spot for any vegetable garden beds. Herbs are particularly handy if they are located near the kitchen, so they can be freshly picked for meals.

Once you have sited and designed your living spaces to take advantage of winter sun, be mindful in selecting and locating solid pergolas and plants to ensure that they don't provide permanent shade to beneficial winter heating.

Check that you have selected a good location for your clothes line. Avoid south facing locations or those that are likely to be shaded by the house or trees. Also, consider setting up an additional clothes line in your garage or carport for rainy days.

Planting

Planting is one of the best ways to provide shade:

- deciduous plants and vine-covered pergolas work well on the north side, because they provide summer shade and let in winter sun
- evergreen plants work well wherever permanent shade is required, such as west-facing walls in warmer climates.

When planning your landscaping, use native plants and shrubs to screen out cold winter winds and to provide privacy from neighbours. Plant trees that provide summer shade and let winter sun in. When selecting trees, consult with a local nursery person and ask about trees that can cope with hotter summers and long dry periods in your location. Also, check that the fully grown height of the plants you select will not shade your own, or your neighbours, PV or solar hot water panels, or living area windows.

Appropriate eaves to the north should provide adequate summer shading, but if more is required then use deciduous plants or vines, such as edible grapes, on a pergola. These may also be useful on the east and west side of the house to provide extra summer shade, but allow sun in during winter.

'We planted a lawn from seed using native weeping grass – it took a little while to get established, but it now looks great!'

Rainwater tanks

Many homes now incorporate rainwater tanks and there are many different styles of rainwater tanks, including clever designs for tight spaces.

To get the most out of your tank, connect it to your garden, toilets and laundry, and make sure you choose a reasonable size – 5,000 litres is ideal, but anything above 3,000 will be of benefit.

Watering your garden

Depending on where you live, up to 50% of the average home's water is used for the garden. You can save a lot of water by:

- Choosing local native plants and groundcovers, which suit Australia's dry conditions.
- Using dripper irrigation systems and mulch, as they target the water on the plant and reduce evaporation.

Pools and outdoor spas

Swimming pools and spas are big energy and water users. A typical in-ground pool can account for up to 30% of a household's energy bills and a pool pump can be the largest user of electricity in a home.

The main use of energy for a pool is regularly pumping water through the filter to keep the pool water clean and safe. Heating your pool, cleaning appliances, pool lights and chlorine or saltwater treatment systems also use additional energy.

If you have time-based pricing for your electricity, then running pumps during the off-peak or shoulder periods could cut running costs by half. Be sure to check that your neighbours can't hear the pump, because regulations require that pool pumps should not be audible to a neighbouring property between 8pm and 7am on weekdays, and 8pm to 8am on weekends and public holidays.

You can also save money by installing an energy efficient pool pump or reducing the running time of your pool pump by investing in a timer. If you have PV panels, then run the pump from your PV system during the day when the sun is shining before you return power to the grid.

There is currently no mandatory requirement for pool pumps to be energy star labelled or meet minimum energy performance standards. However, there is a voluntary labelling program that helps you to identify high efficiency pool pumps, and save you money. To compare how much energy pool pumps use, check the energy consumption figure on the label. Many pool pumps also report noise levels on the label – a quiet pool pump is sure to make your neighbours happy!

Checklist: Our outdoor areas

Will our alfresco areas get sun in winter and be cool and shady in summer?

Where should we plant trees to provide summer shade?

Who is our local nursery person that we can ask about native trees that can cope with hotter summers and long dry periods in our location?

Will we use local native plants, drought-resistant plants and mulch in our garden, to save water?

Will we grow our own vegetables and herbs?

How many litres will our rainwater tank hold?

What fixtures will our rainwater tank be plumbed in to?

Can our driveway be made of permeable pavers?

Comments, things we'd like to change:

Tips:

If you don't want one big rainwater tank you could try a series of smaller, connected tanks.

When planting trees take care to place them so their roots won't damage walls or footings.

Choose 'permeable' paving that allows rain to soak through or between the pavers.

Don't mulch above the termite protection layer, as this will create a pathway for termites into the framing.

Smart tips for pools

- Invest in a pool blanket. If your pool is heated, a pool blanket will keep the heat in and cut running costs by up to 50%. A pool blanket will also reduce water evaporation to both heated and unheated pools.
- Choose a pump with lots of stars. Like for a house, fridges and other appliances, a pool pump with more stars on the label will be more efficient to run. The rating scale for pump units is from 1 to 10.

Find out more

Your Home sections:

Landscaping and garden design

Outdoor water use

Wastewater reuse

www.yourhome.gov.au

step 1

step 2

step 3

step 4

step 5

step 6

step 7

step 8

step 9

step 10

step 11

step 12

Finish off

Accessing your building site

Once construction begins, unless you have permission from the builder and have had a full safety induction, or are accompanied by someone who has, you are not allowed to enter your site. This is because your builder is responsible for making sure that only people with a construction induction card are allowed unsupervised access on the site, even if you are the owner.

If you are interested in the build process, or there are particular energy efficiency extras that you have paid for that you want to inspect to check they have been installed correctly, then you need to discuss with your builder about what you need to do so that they are comfortable about you going onto the site.

Always check the situation first with your builder before the build starts. You may be able to do an induction and then keep an eye on progress on weekends when you will not get in the way of the workers or ask if it is worth your while to undertake a short OH&S course to secure a White-Card that should allow you to be on site during construction. Check with both your builder and your local building approval authority to see what the requirement is in your area.

Final Inspection

When your house construction is complete, it is important to be prepared for the final Practical Completion Inspection.

Consider taking a knowledgeable friend or qualified expert along with you for this final inspection. A qualified expert can use a ladder to check additional items, such as the installation of ceiling insulation, that any ductwork for kitchen and bathroom vents are well-sealed and not damaged, all protective plastic on the metal deck roofing has been removed and recycled, the external vent dampeners are opening and closing correctly, and that air is moving to the outside of the house.

You should also check that all sliding doors and windows, kitchen cupboards and drawers, locks, lights and power-points are working. Check that none of the sinks, baths and shower trays are scratched, as these are common spots for damage to happen. Also check the air-conditioner on both heating and cooling mode, garage doors and other fixed appliances (like dishwashers) work correctly. Go through every aspect of the building in a systematic and methodical way.

'I was so glad I did a good final inspection. My ceiling insulation was not laid properly and we were able to get it fixed.'

Zero Emissions Lifestyle

The first steps towards achieving a zero emissions lifestyle are to:

- Use less energy in your home by choosing energy efficient design and appliances;
- Use transport that produces less emissions, like cycling, walking or electric cars/buses/trams, and fly less;
- Eat less carbon intensive food and grow your own or source food locally; and
- Use less products and produce less waste, by recycling or saying no!

The second step is to generate your own power or use power from sources that are zero emissions.

The third step is to offset any remaining emissions through recognised carbon offset schemes.

This is your final chance to sign-off on everything, so take your time and don't hesitate to document all the items you expect to be fixed. It's much easier to get things fixed at this stage, before the final payment is made. Discuss all the items that need fixing with your Expert and agree on a time for the work to be completed and re-checked before making the final payment.

Operating your home

Remember that houses need to be actively managed and operated to perform at their best with limited heating and cooling. This means that cross ventilation needs to be monitored and the house opened up to cooling breezes or closed down against summer heat. If the house is empty all day in summer, then blinds and curtains should be closed to avoid overheating.

Keep all warranty and user manuals in a folder, in case you need them or you sell your home – you or the next owner will then have access to all the operating information in one place.

Checklist: Finishing off

Will we be able to gain access to our building site while it is being built, or do we need to complete a site safety induction?

Who is a suitable person we could ask to do the final inspection with us?

Have we downloaded or created a comprehensive list to guide us through what we should look for in each room? For example check that all sliding doors and windows work, check insulation is laid properly in the roof, etc.

Have we sent the Builder a complete list of all the repairs that need to be made before we pay the final payment?

Have we got a folder with all the operating manuals and warranty documents?

Tips:

Get a qualified expert to use a ladder to check for insulation in the roof space and cracks in the plaster.

Use an electrical appliance to check that every power point works.

Flush toilets, fill the bathtub and laundry tub, run the showers (including the hot water), and turn taps on at full pressure to check for any leaks and to make sure the flow and drainage all works, particularly around showers.

Additional information

Here's where you can find more information:

- Buying a house: www.youtube.com/watch?v=6jIEAnucKU0
- 'Renew' and 'Sanctuary' magazine (buy from a newsagent or borrow from your local library)
- 'Warm House, Cool House' by Nick Hollo (borrow from your local library)

Find out more

Your Home sections:

Carbon zero, carbon positive

www.yourhome.gov.au

Photos

Cover—A Living Building Solutions design with image by Finn Howard Photography (@finn_howard_) (FH); Page 4—www.pexels.com (PEX), PEX; Page 5—www.pixabay.com (PIX), PEX; Page 6—PEX, Light House Architecture & Science (LHAS); Page 7—SEE-Change (SC), PEX; Page 8—Department of the Environment and Energy (DEE), Commonsense Sustainable Solutions (CSS); Page 9—LHAS, PEX; Page 10—LHAS, CSS; Page 11—LHAS, LHAS; Page 12—LHAS, CSS, LHAS; Page 13—DEE, DEE; Page 14—PEX, DEE; Page 15—FH, LHAS; Page 16—DEE, FH; Page 17—FH, DEE; Page 18—Rotex, Haiku, DEE; Page 19—SC, Redflow; Page 20—PEX, DEE; Page 21—DEE, Methven, DEE; Page 22—PIX, LHAS; Page 23—PEX, PEX, PEX, PEX; Page 24—DEE, DEE; Page 25—FH, PIX; Page 26—LHAS, PEX; Page 27—SC, PEX;

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Disclaimer

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About SEE-Change

SEE-Change is a community, not-for-profit group focused on local grass roots action in Canberra. The 'SEE' in SEE-Change stands for **S**ociety, **E**nvironment and **E**conomy. SEE-Change's mission is to inspire, inform and support action to: reduce Canberra's ecological footprint; improve the resilience of the ecosystem; and enhance the wellbeing of all individuals. SEE-Change activities are practical and developed by local SEE-Change groups to best meet the needs and interests of their local community.

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Paul Nagle has over 20 years experience in energy efficiency and sustainability. Paul has worked on energy rating programs and software tools for both the New Zealand and Australian governments, including being the technical manager for the Nationwide House Energy Rating Scheme (NatHERS), and provided technical advice to *Your Home*. Paul now runs the consultancy Commonsense Sustainability Solutions.

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