

SUSTAINABLE HOME

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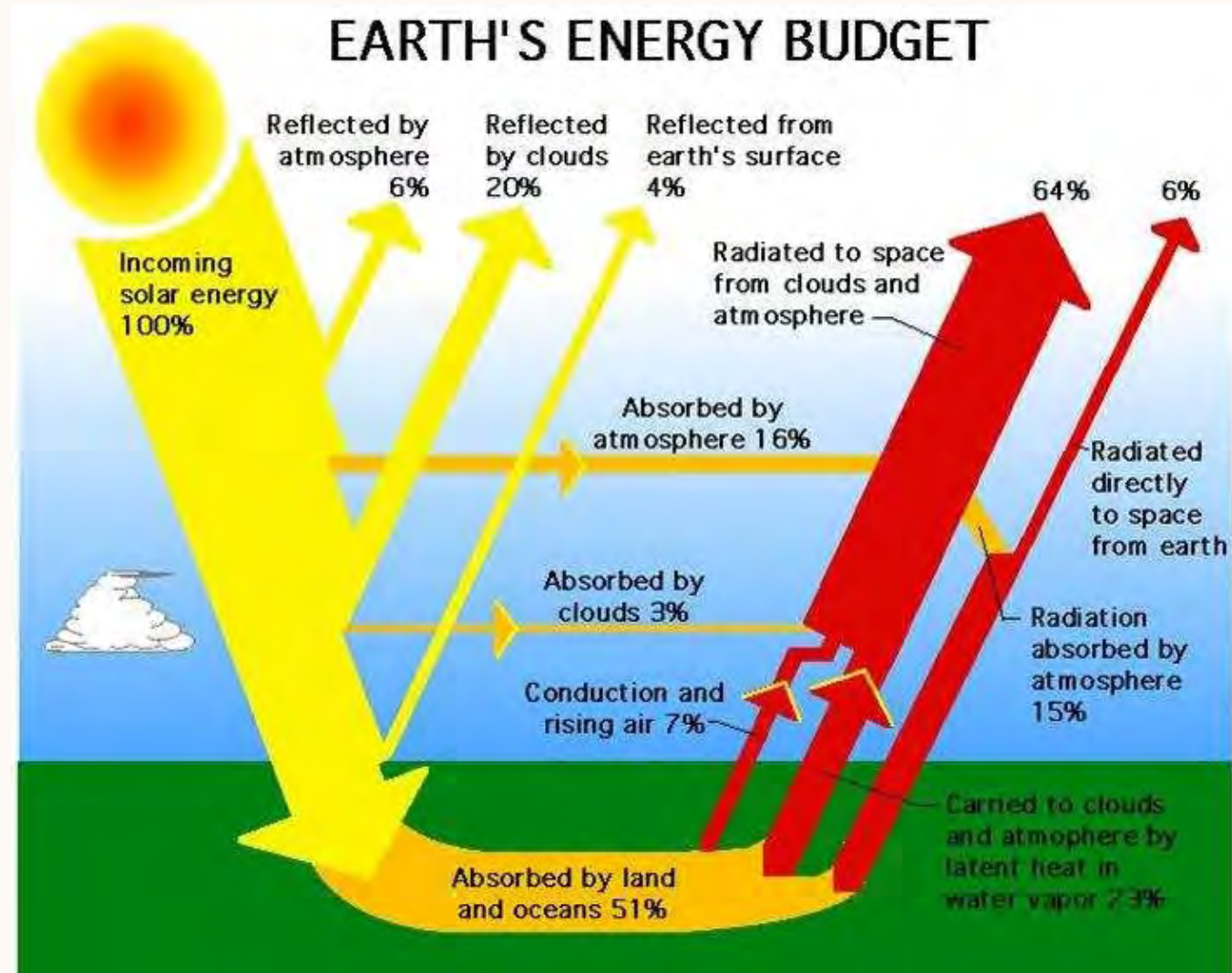
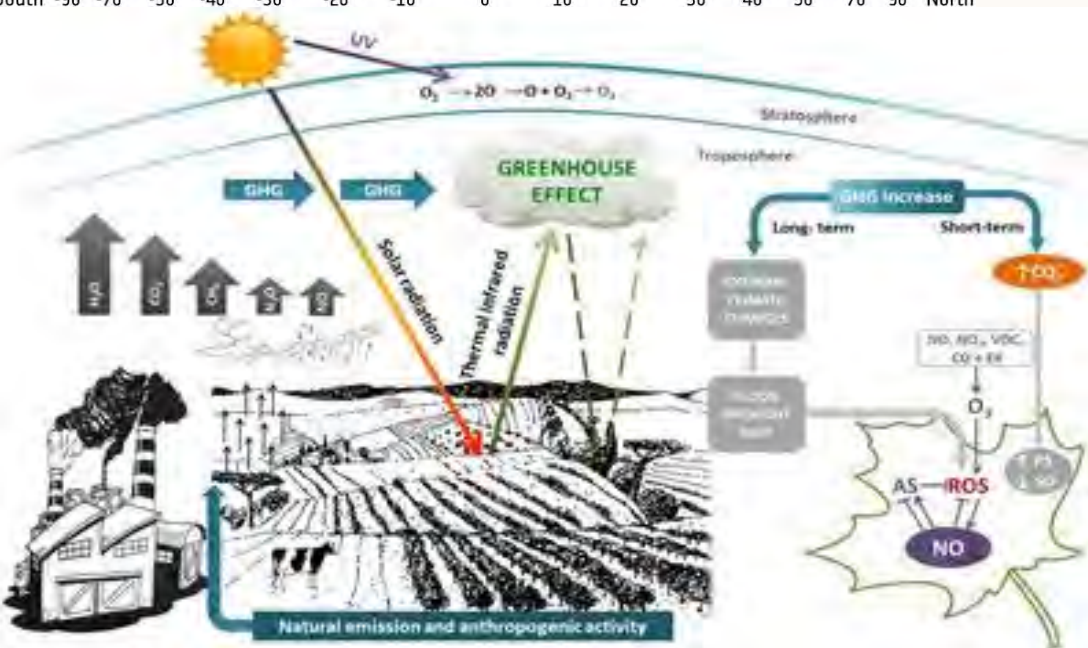
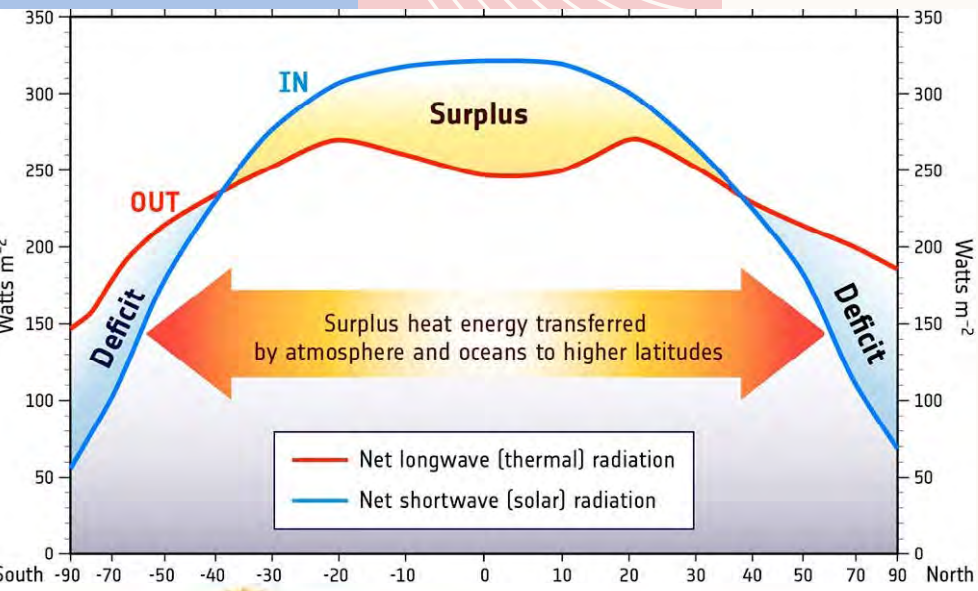
Environmental Scientist and Lawyer, Sydney Uni

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MBA, IBA, Dhaka University, Bangladesh

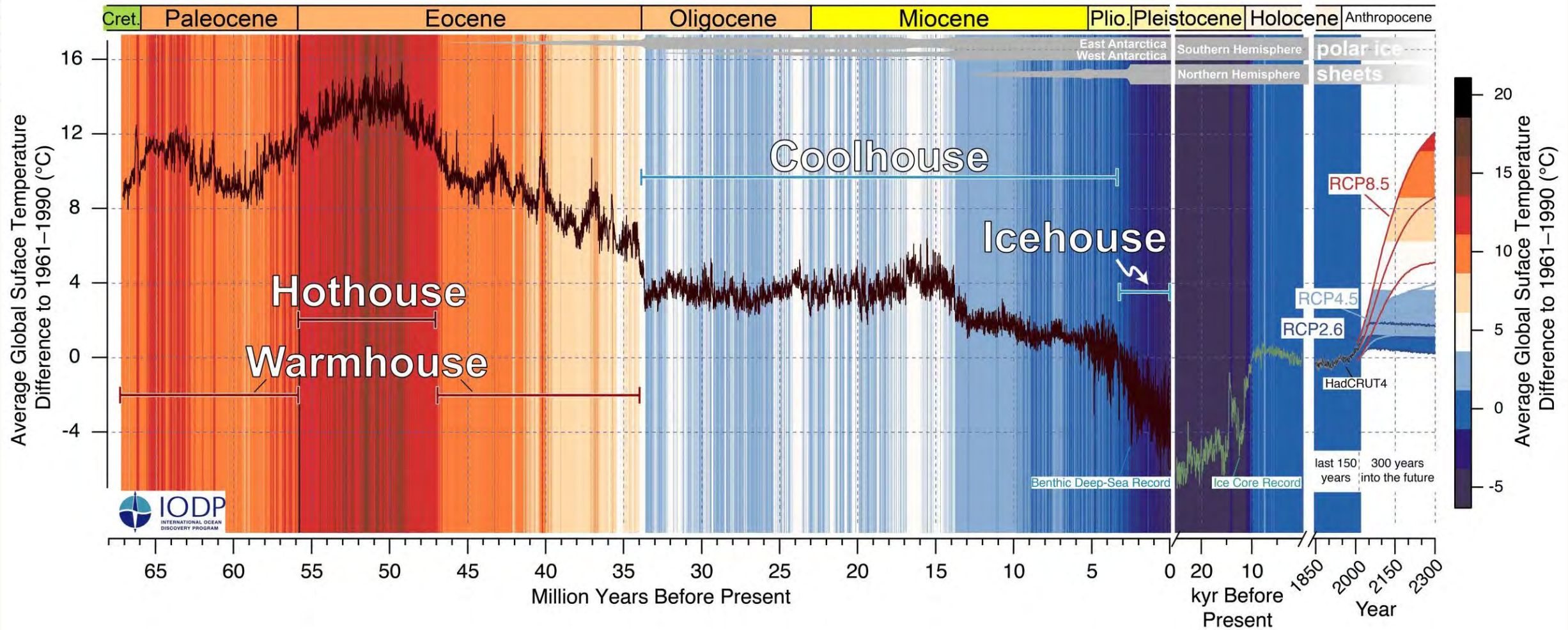
CLIMATE IS CHANGING

EARTH'S ENERGY BALANCE





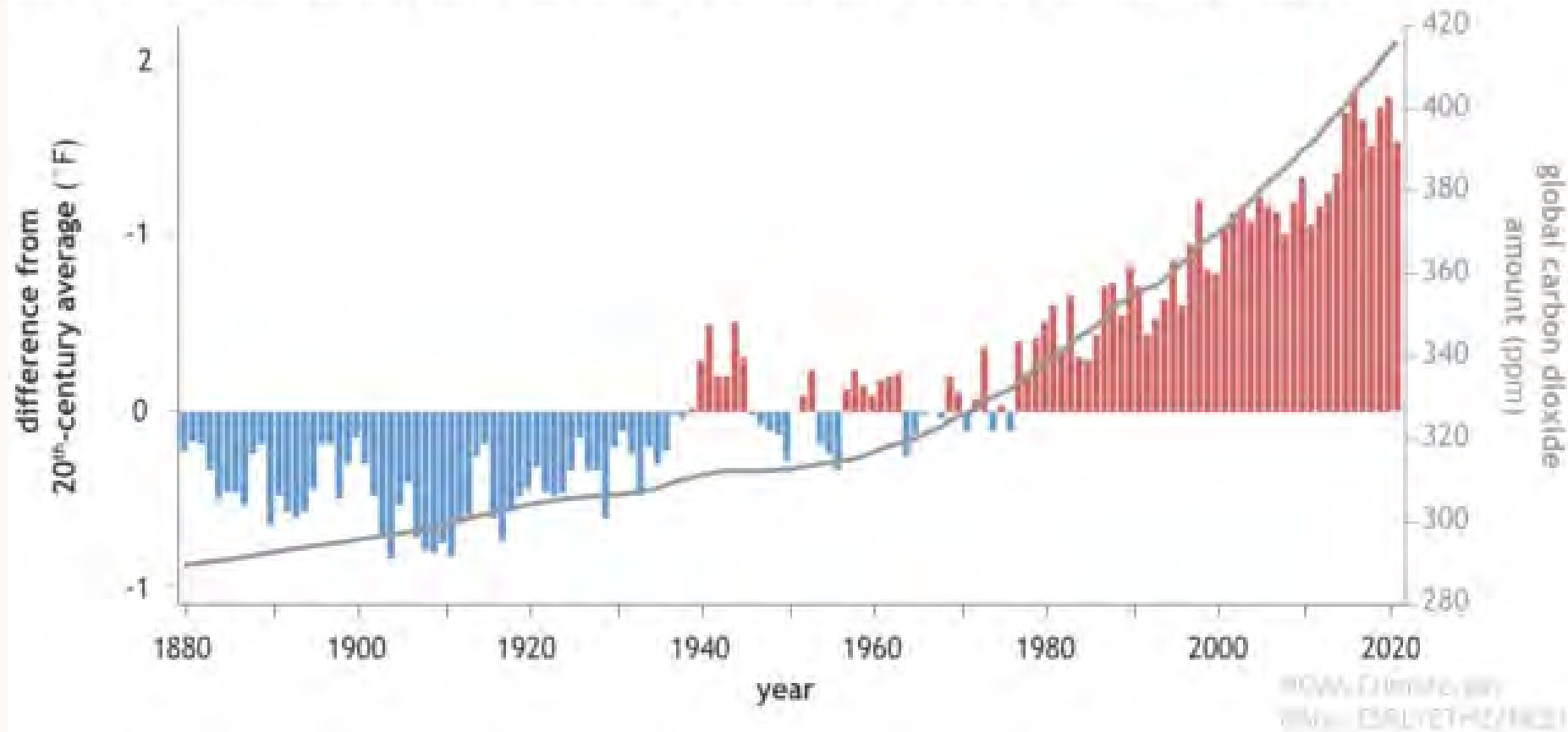
INCREASE IN TEMPERATURE





INCREASE IN TEMP VS. CO₂

Changes in global temperature and average atmospheric carbon dioxide (1880-2021)



IMPACT OF CLIMATE CHANGE⁶






SOLUTION !!!



United Nations
Framework Convention on
Climate Change



 Save energy at home	 Walk, bike, or take public transport	 Eat more vegetables	 Consider your travel	 Throw away less food
 Reduce, reuse, repair, recycle	 Change your home's source of energy	 Switch to an electric vehicle	 Make your money count	 Speak up

Video

https://cdnapisec.kaltura.com/p/2503451/embedPlaykitJs/uiconf_id/49754663?iframeembed=true&entry_id=1_fxd5wy8p

SUSTAINABILITY



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In 1987, the United Nations **Brundtland Commission** defined sustainability as “meeting the needs of the present without compromising the ability of future generations to meet their own needs.” Today, there are almost 140 developing countries in the world seeking ways of meeting their development needs, but with the increasing threat of climate change, concrete efforts must be made to ensure development today does not negatively affect future generations.

- **You are the key to a cleaner and pollution-free air.**
- Love to breathe, save the trees. Save the Earth, Save Yourselfes. Think green.
- The idea that goods and services should be produced in ways that do not use resources that cannot be replaced and that do not damage the environment:
- The successful coffee chain promotes sustainability within the coffee-growing regions, the ability to continue at a particular level for a period of time:



AUSTRALIAN INITIATIVES



Buy, build, renovate

If you are thinking about designing, building or renovating, find out what features are best for your climate, lifestyle and budget.



Passive design

Designing to take advantage of natural sources of heating and cooling can deliver a lifetime of comfort and low energy bills.



Materials

Careful selection and use of building materials can save you money, reduce waste and minimise environmental impact.



Energy

Find out how to save money by reducing energy consumption, switching to renewable energy and using efficient appliances and technologies.



Water

Learn how to reduce water inside and outside the home to protect our waterways and limit wastage.



Live and adapt

Ensure your home and garden are liveable and adaptable to changes in lifestyle and climate.

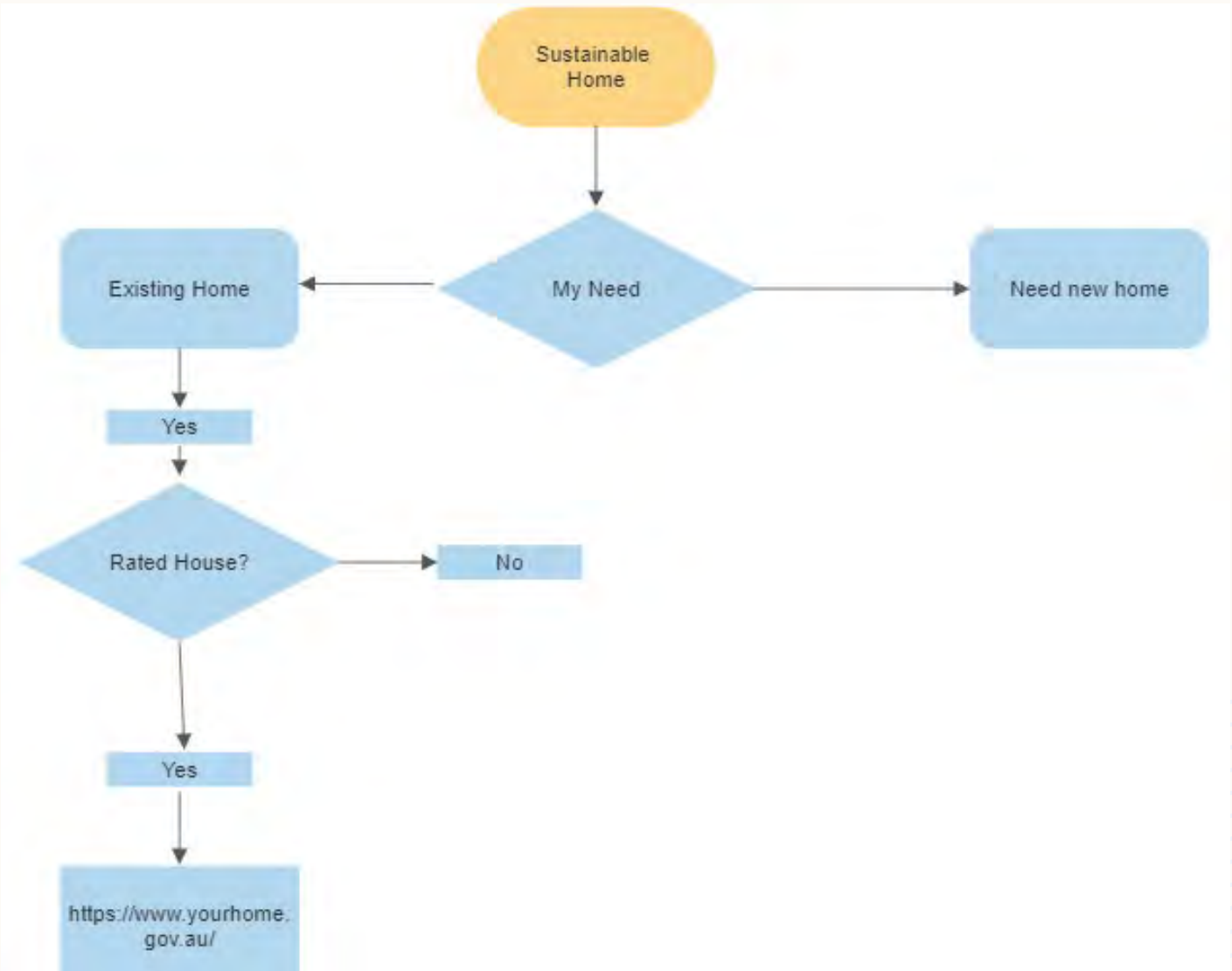


DECISION CHART

What are you looking for a Sustainable Home?

- Materials
- Energy
- Water
- Adaptability

<https://www.youtube.com/watch?v=8hQutAGfjhU>





MATERIALS

- Embodied energy
- Waste minimization
- Sediment control
- Construction systems
- Concrete slab floors
- Lightweight framing
- Brickwork and blockwork

- Embodied energy
- Embodied energy is a calculation of all of the energy used in the production of a building, from mining to manufacturing, and transport. Sourcing materials with low embodied energy can reduce your home's environmental impact.
- Waste minimisation
- Building waste makes up approximately 44% of Australia's waste. The 'three Rs' of waste minimisation – reduce, reuse, recycle – should be applied throughout design and construction.
- Sediment control
- Sediment control should be used on building sites to prevent sand, soil, cement, and other building materials from reaching waterways.
- Construction systems
- Construction systems are the combinations of materials and methods used to build roofs, walls, and floors. Each has advantages and disadvantages.
- Concrete slab floors
- Concrete slab floors can be on ground, suspended, or a mix of both. They have high thermal mass that can assist in effective passive design when used in the right climate.
- Lightweight framing
- Lightweight framed construction using timber or steel is the most popular construction system used in Australia.
- Brickwork and blockwork
- Bricks and blocks of clay and concrete are common building materials, used in brick veneer, reverse veneer or double brick construction.



MATERIALS

- Precast concrete
- Autoclaved aerated concrete
- Cladding systems
- Mud brick
- Hemp masonry
- Rammed earth
- Straw bales
- Green roofs and walls

- **Precast concrete**
 - Precast concrete can be poured and set either onsite or offsite before being lifted into place, offering a fast construction method.
- **Autoclaved aerated concrete**
 - Autoclaved aerated concrete (AAC) has been manufactured to contain many air pockets, forming a lightweight building material with lower embodied energy than conventional concrete.
- **Cladding systems**
 - Cladding is the non-loadbearing skin or layer attached to the outside of a home to protect the building from water and weather. There are many different cladding options available.
- **Mud brick**
 - Mud bricks are made by mixing earth with water, placing the mixture into moulds and drying the bricks. Mud brick construction has low environmental impact.
- **Hemp masonry**
 - Hemp masonry mixes hemp fibre, lime and sand. The hemp and lime react to cure the mixture and sand provides additional thermal mass and strength. Hemp masonry construction provides good insulation and has low environmental impact.
- **Rammed earth**
 - Rammed earth walls are constructed by ramming a mixture of gravel, sand, and clay – and sometimes some cement – into place between flat vertical panels. Rammed earth typically has low environmental impact.
- **Straw bales**
 - Straw bale walls are built using straw bales around a lightweight frame. They are rendered and resistant to fire, pests and decay. Straw bale construction provides good insulation and has low environmental impact.
- **Green roofs and walls**
 - Green roofs and walls are designed to hold soil and growing medium, or growing mats, to support plants. They provide many benefits to a home and can play a role in reducing urban heat.



ENERGY

Heating and cooling

Heating and cooling systems are typically the largest energy user in homes. Careful choice of heating and cooling options, together with good passive design, will ensure your home is both comfortable and energy-efficient.

Hot water

Water heaters may be storage systems or continuous flow (instantaneous) systems, and can be powered by solar energy, gas or electricity. Your hot water system should be chosen to match your household size, climate and water use.

Lighting

Australia is phasing out older, less-efficient lighting products. Efficient and well-designed lighting should maximise the use of natural light and deliver the most appropriate lighting for tasks and spaces.

Appliances and technology

Home appliances and equipment use an average of 25% of household energy. Upgrading to energy-efficient models can provide ongoing savings by reducing energy bills. Use Energy Rating Labels to compare products and find the right one for your household.



ENERGY

Connected home

In a connected home, appliances and technology can be controlled automatically and remotely using your home internet connection or phone. Systems such as heating, cooling, lighting and entertainment can be connected to suit your lifestyle and save energy.

Renewable energy

There are various options for powering your home with renewable energy. For example, you can install a solar hot water system, or meet all of your energy needs with renewable electricity from a photovoltaic system.

Photovoltaic systems

Photovoltaic systems convert solar energy into electricity. Photovoltaic systems, also known as solar PV, are increasingly used to supply energy to homes and businesses across the country.

Batteries

Batteries allow you to store energy to be used at a later time, and can be a useful component of household electricity generation systems. Battery systems may be stand-alone or connected to the grid.

Transport

Active transport options and new vehicle technology can reduce your fuel use and greenhouse gas emissions. Electric vehicles are becoming an option for more households as their range and availability, as well as the number of charging stations, increase.



WATER

Reducing water use

Reducing water use in the home is a simple and easy way to decrease water and energy bills and reduce your household's environmental impact. Water-efficient showerheads, taps, appliances and toilets can significantly reduce water use. Look for the Water Efficiency Labelling and Standards (WELS) label for water-efficient products.

Rainwater

Collecting and using rainwater can reduce your water bills and help maintain your garden during water restrictions. It can also help to conserve water resources and reduce environmental impacts beyond the home.

Wastewater reuse

Many Australian homes use potable (drinkable) water for practically everything in the house and garden. You can reduce potable water use in the home by treating and reusing greywater (from showers, basins and taps) and blackwater (from the toilet, kitchen sink and dishwasher).

Stormwater

Stormwater is rain that falls on the roof or land. Stormwater that carries soil, organic matter, litter and fertilisers from gardens and oil residues from driveways can pollute downstream waterways. Capturing, storing and reusing stormwater can save potable water and reduce downstream environmental impacts.

Outdoor water use

The principles of water-efficient garden design include choosing plants adapted to the local climate, improving the condition and moisture retention of soil, adding mulch to the garden, and using water-saving garden products and efficient irrigation systems. If you have a pool, use a cover to minimise evaporation.

Waterless toilets

Toilets that do not require water for flushing can have lower environmental impacts than water-efficient toilets. If appropriately designed, they save water and money, and avoid disposal of effluent and pollutants into waterways and the general environment. There are different types of waterless toilets that do not smell and may suit a modern bathroom.



LIVE AND ADAPT

The liveable and adaptable home

A liveable and adaptable house can respond to changing household needs without requiring costly or substantial alterations. Careful design and planning helps to make sure your home suits you now and in the future.

Adapting to climate change

Our homes keep us comfortable and protect us from the weather. To make sure your home can cope in a changing climate, you can explore potential design solutions to help manage heatwaves, low rainfall, storms, or sea level rise.

Bushfire protection

Homes and their natural surrounds can be designed and built to reduce the risk of exposure to natural hazards such as bushfires. In bushfire prone areas your house site can be assessed for bushfire attack levels (BAL) and appropriate design and construction methods and materials can reduce the likelihood of bushfire damage to your home.

Zero energy and zero carbon homes

Zero energy and zero carbon homes produce as much renewable energy as they use; carbon positive homes produce more renewable energy than they use and export the excess energy to the electricity grid. Zero energy, zero carbon and carbon positive homes play an important role in helping to reduce the rate and impact of climate change.

Indoor air quality

Poor air quality can cause health problems. We spend a lot of time inside our homes, so it is important to ensure good indoor air quality by finding ways to prevent or limit air pollutants and ventilating our homes well.

Food and organic waste

Household waste includes food and organic waste, which can be treated and recycled onsite rather than being sent to landfill. There are various options for turning food and garden waste into valuable organic resources.

Safety and security

The design of your home and outdoor areas can affect safety (how often accidents occur) and security (likelihood of crime). Careful design will make your home safer and more secure.

Noise control

The design of your home can also affect how noisy it is. Your choice of floor plan, layout, and building materials will affect how noise travels into, within, and out of your home.

Landscaping and garden design

Sustainable landscaping uses native and indigenous vegetation with low water requirements to provide habitats and encourage biodiversity. Additional benefits include shade, storm water management and the ability to grow your own fruit and vegetables.



THANK YOU