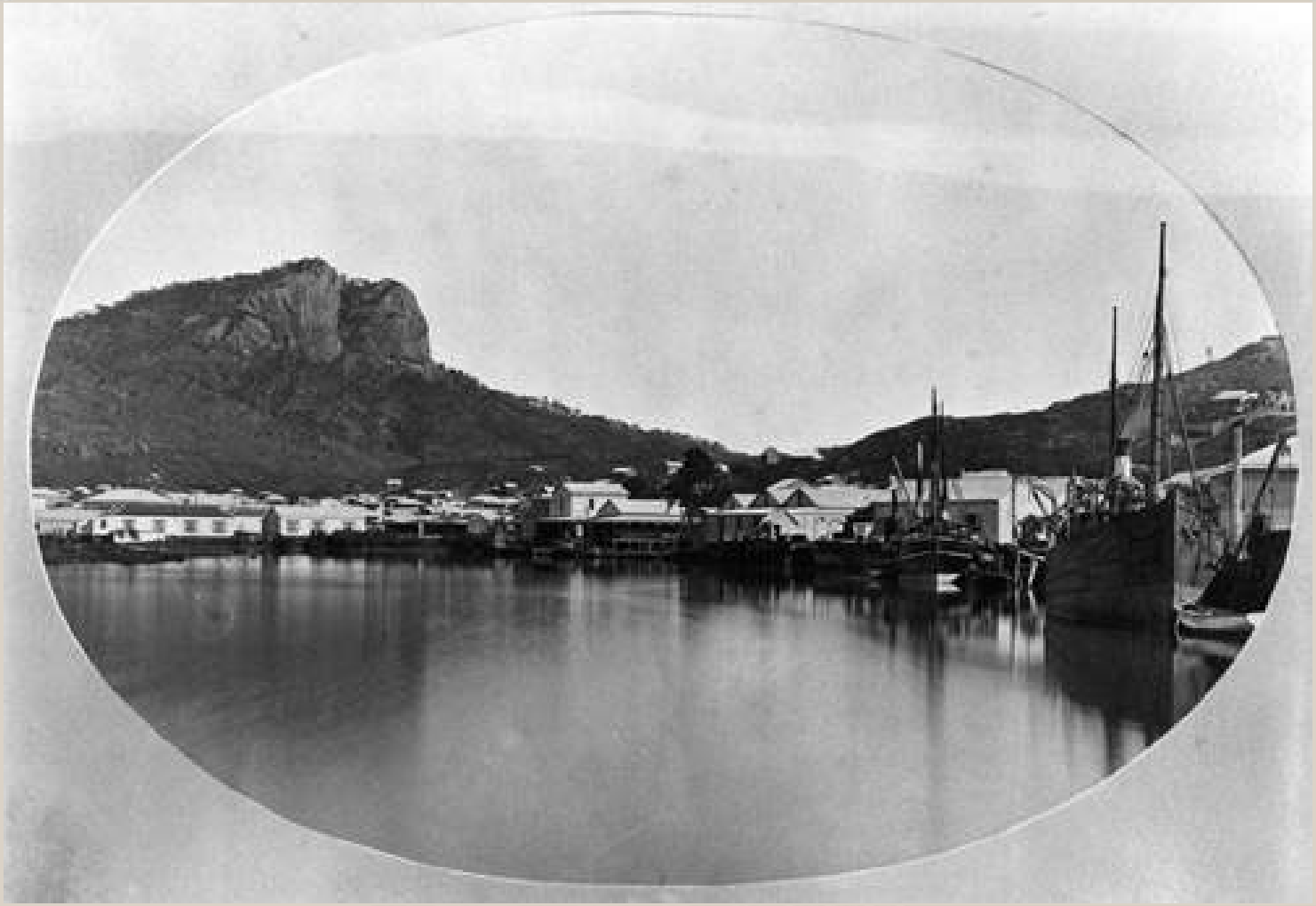
Sustainable Schools Competition 2007

Progressing the vision of a Sustainable Townsville

Townsville - the Past



Townsville – the Present

Townsville – the Future?

What to Avoid……

Keep Townsville Green!

PURPOSE OF THE COMPETITION

>> Raise the profile of sustainable city design amongst school students

>> Develop your understanding on sustainability issues

>> Show how young people perceive these issues

>> Young people have their say on how sustainability!

WHAT WILL YOU HAVE TO DO?

>> Produce a design of Townsville City and demonstrate how it could become more sustainable

>> Can take any form- poem, poster, report, interview, essay, artwork or a combination of these. Be Creative!

>> Display

>> Prizes

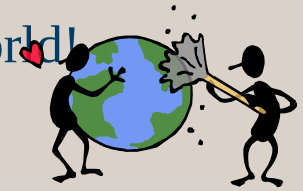
>> You will have to have finished by 15th November 2007

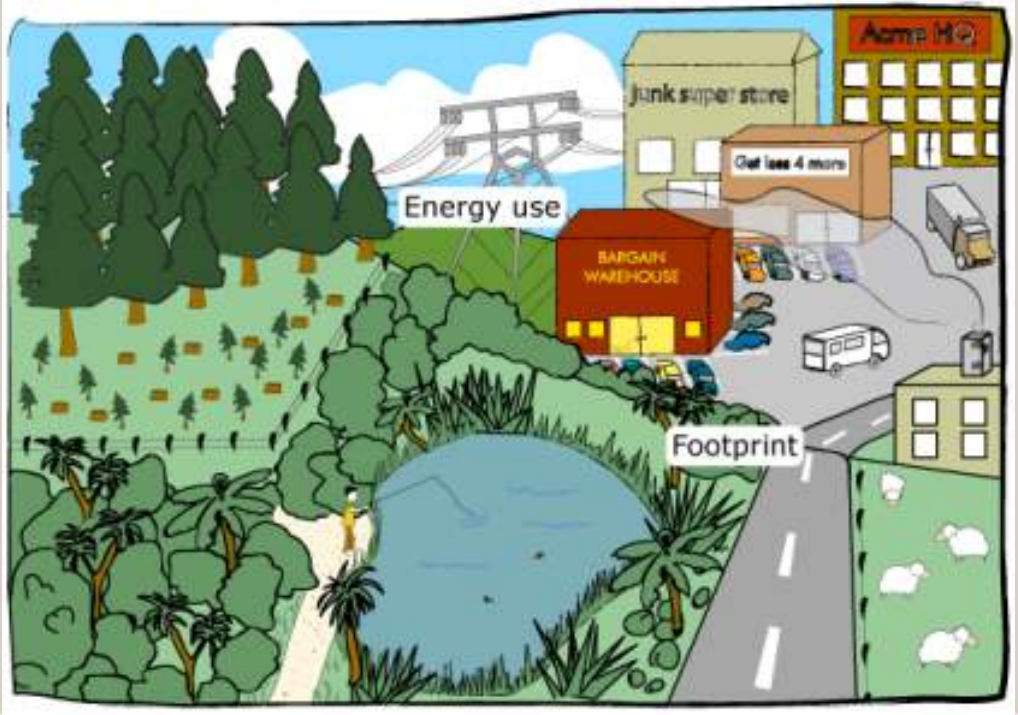
WHAT ABOUT TOWNSVILLE CITY COUNCIL?

>> TCC- Office of Sustainability via Integrated Sustainability Services will help you with their entry

>> You can jump on our website and see what sustainability initiatives there are here in Townsville! www.soe-townsville.org

>> Entries from Townsville- and from around the world!





1. SUSTAINABILITY >>

Drawing credits: Environment Waikato regional Council www.waikato.govt.nz

WHAT IS SUSTAINABILITY?

>> Sustainable Development was first defined in 1987 as development that "*meets the needs of the present without compromising the ability of future generations to meet their own needs*."

>> Triple bottom line of sustainability: Economy, Environment, Social

WHAT IS SUSTAINABILITY? (cont'd)

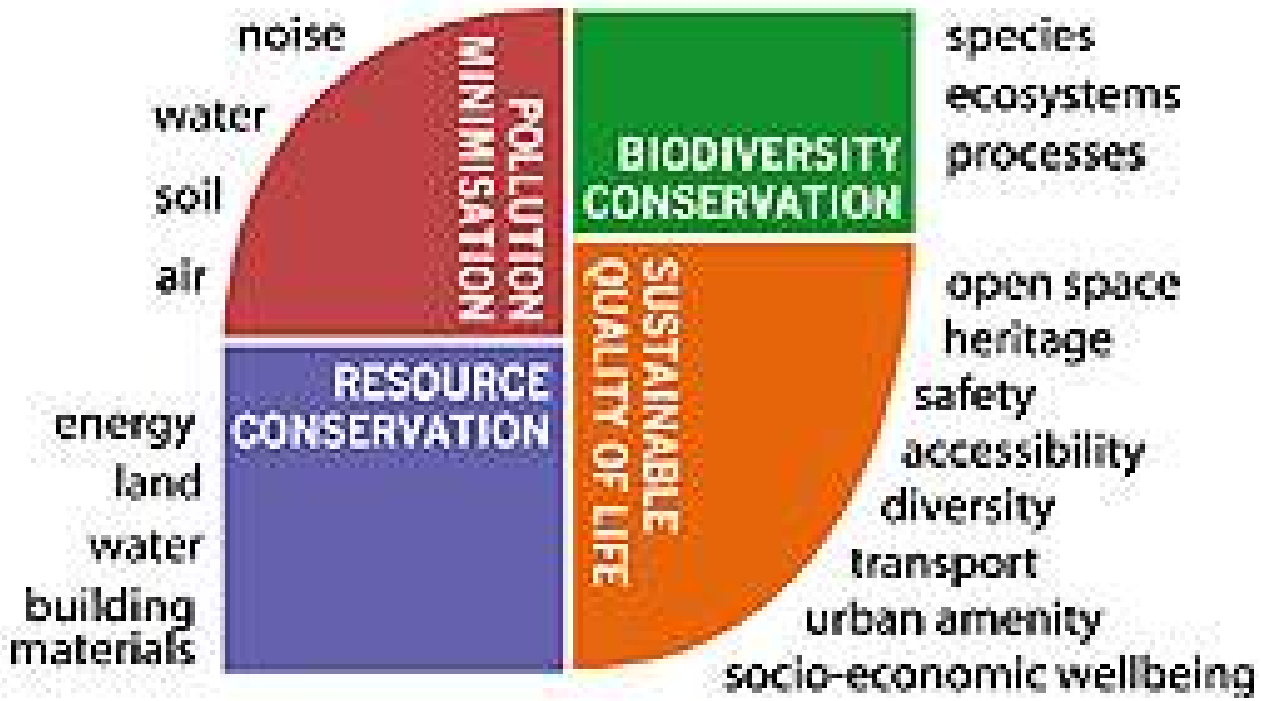
>> Sustainability is about configuring human activity so that everybody can meet their needs and full potential, while preserving our ecosystems and natural resources so that future generations can enjoy their use as well

>> Sustainability can be investigated at every level of organization, from the local neighbourhood to the entire planet

SUSTAINABLE CITY- What is to be considered?

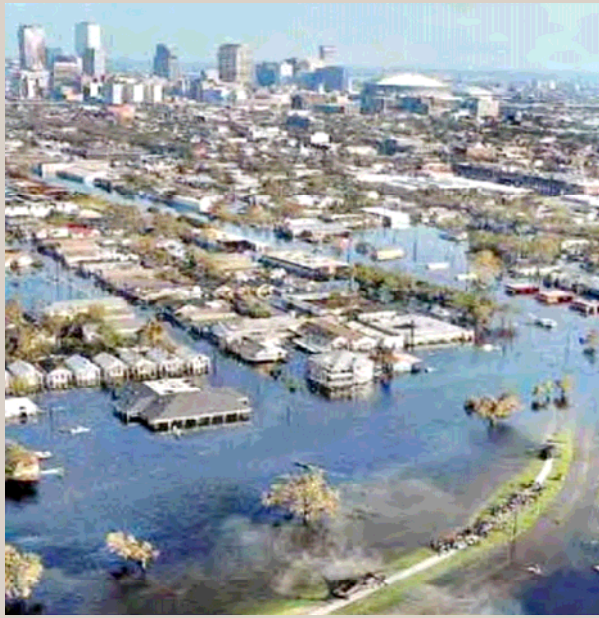
- **Renewable Energy**
- **Water Management**
- **Waste Management**
- **Habitats and Biodiversity**
- **Sustainable Business**
- **Sustainable Architecture and Planning “Green Building” design**
- **Public Transport**

AN EXAMPLE OF SUSTAINABILITY POLICY



WHY SHOULD A CITY BE SUSTAINABLE?

- GLOBAL WARMING- Cities have to adapt and prevent risks like floods, draughts, cyclones, extreme temperatures etc.
- RISING PRICE OF PETROL- we have to start thinking of other ways to get our energy and structure our economy
- POPULATION GROWTH- Cities are becoming bigger and bigger and are using more and more resources
- Our natural resources are not unlimited!!



What is Energy?

>> Energy is the ability to do work.

>> Many Types – Electrical, Heat (thermal), Light (radiant), Mechanical, Nuclear

>> Cannot be made nor destroyed, but can change forms. E.g Electrical energy transformed into heat energy for cooking.

Types of Energy

>> **Kinetic** – Movement energy of waves, electrons, atoms, molecules, substances and objects.

Examples: Electrical energy, thermal energy, and sound

>> **Potential** – Stored energy.

Examples: Mechanical energy & nuclear energy

Everyday uses…

Energy- where does it come from?

>> Non-Renewable Energy – Comes from finite resources that will eventually run out. This includes Coal, Oil & Gas.

>> Renewable Energy – Energy source that can be replaced quickly in a short period of time. This includes Solar, Biomass, Geothermal, Tidal & Wind.

Coal – our main source of base load power

Oil & Gas

Hydro-Electricity

http://www.rise.org.au/info/Res/hydro/index.html

Nuclear

http:///upload.wikimedia.org

Electricity network & national grid

urce: Australian Greenhouse Office, Department of the Environment and Water Resources

Our energy intensive world…

Our Ecological Footprint

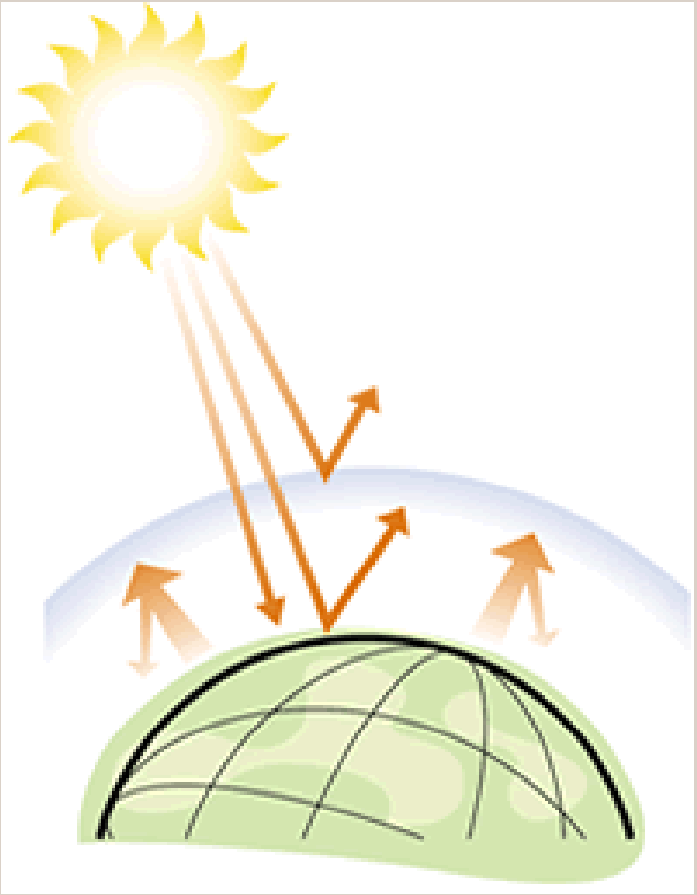
>> Did you know that the average Australian household produces more than twice the world average of greenhouse gas emissions each year?

>> Think about your ecological footprint. Do you tread lightly on the earth or leave a heavy imprint?

Consequences of excessive energy use – Urban Pollution, Climate Change…..

The Natural Greenhouse Effect

>> Greenhouse gases act like a blanket, trapping in heat from the sun to maintain the surface temperature of the earth.

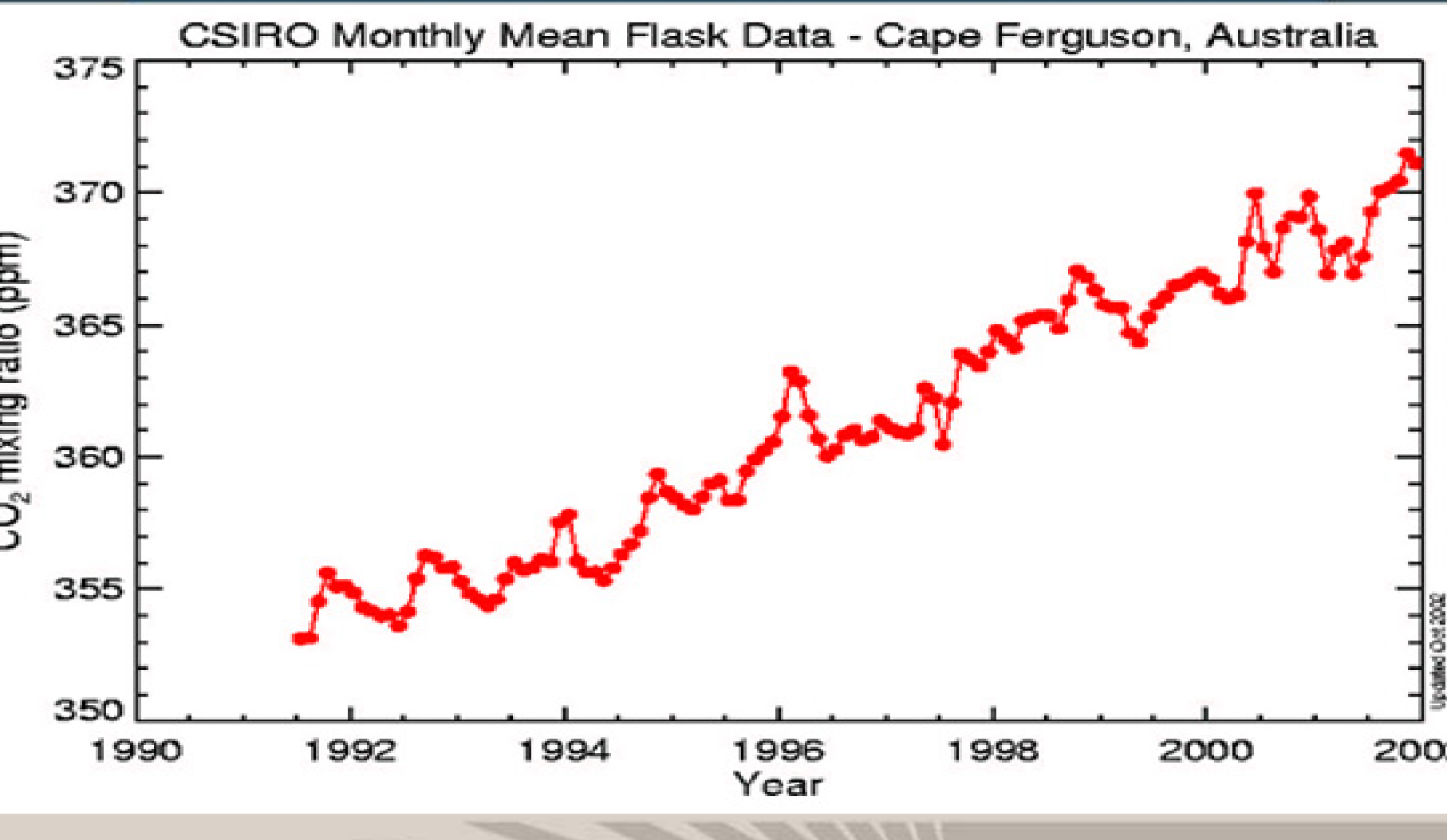


Enhanced Greenhouse Effect

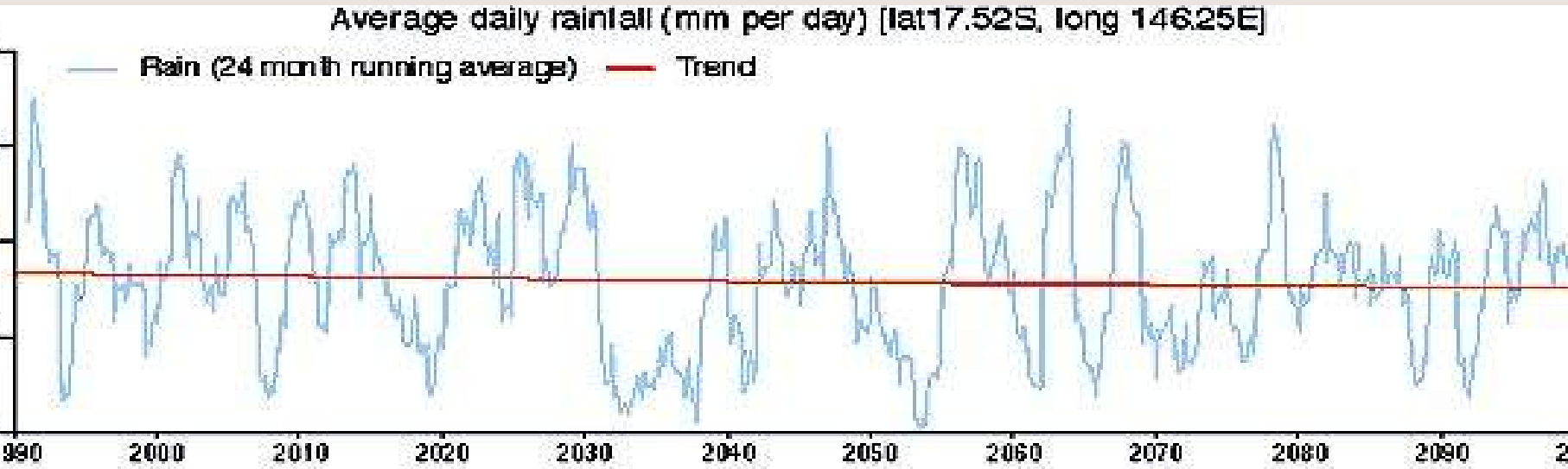
>> Burning of fossil fuels, land clearing, and population growth have led to an increase in greenhouse gases and a rise in the earths temperature.

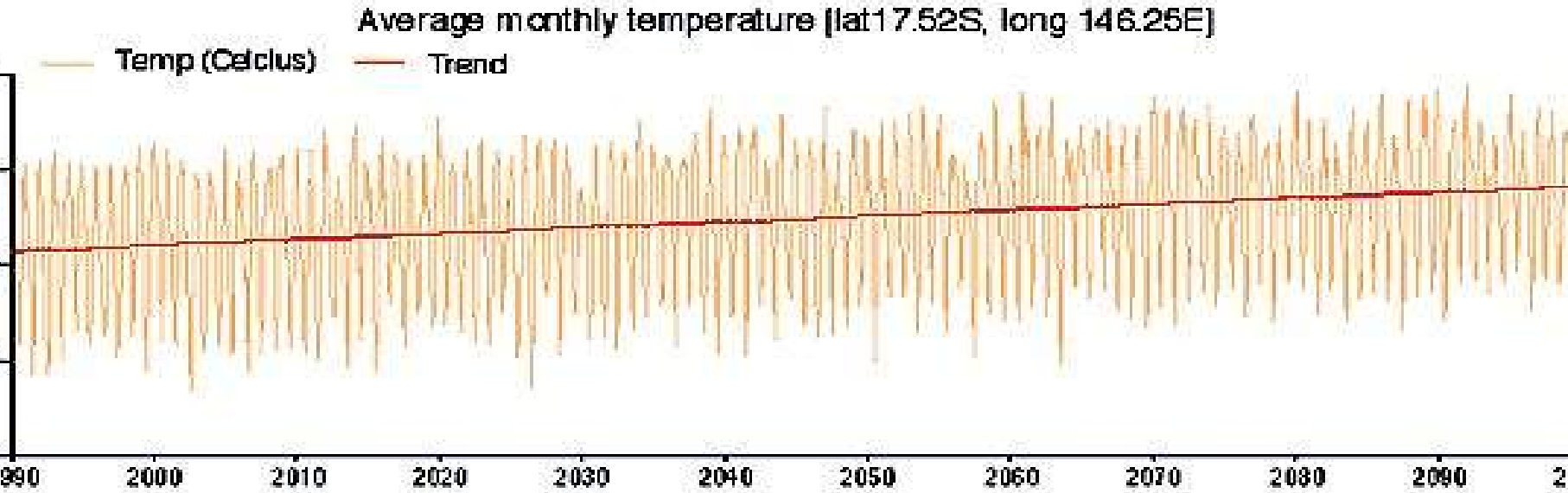
Referred to as ‘Global Warming’ or ‘Climate Change’

CO2 monitoring Townsville



Townsville Hotter and Drier





Main sources of Greenhouse Gas Emissions Are:

>> Coal-Fired Power Stations and Factories.

>> Agriculture, including methane from livestock.

>> Transportation

>> Emissions, mainly from methane, from waste during collection and disposal

Steps to Slow Down Global Warming

>> **LEARN** about the greenhouse effect and inform your family and friends. Get involved in community environmental groups.

>> **PLANT** trees and plants native to your region. Trees absorb carbon dioxide and create shade – making your home cooler.

>> **TAKE** responsibility for making simple changes in reducing your energy consumption. Two key areas are electricity consumption and transportation.

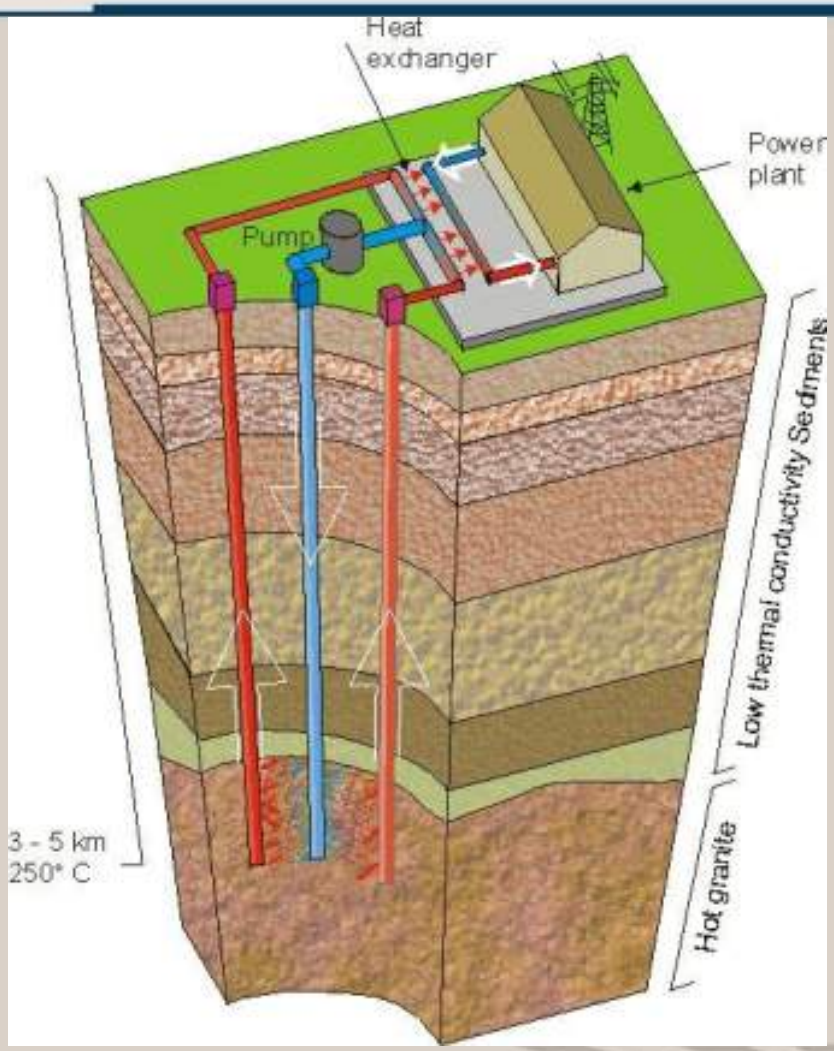
Where could energy come from?

>> To reduce our greenhouse gas emissions, we need to increase our use of renewable energy resources

Solar

Wind

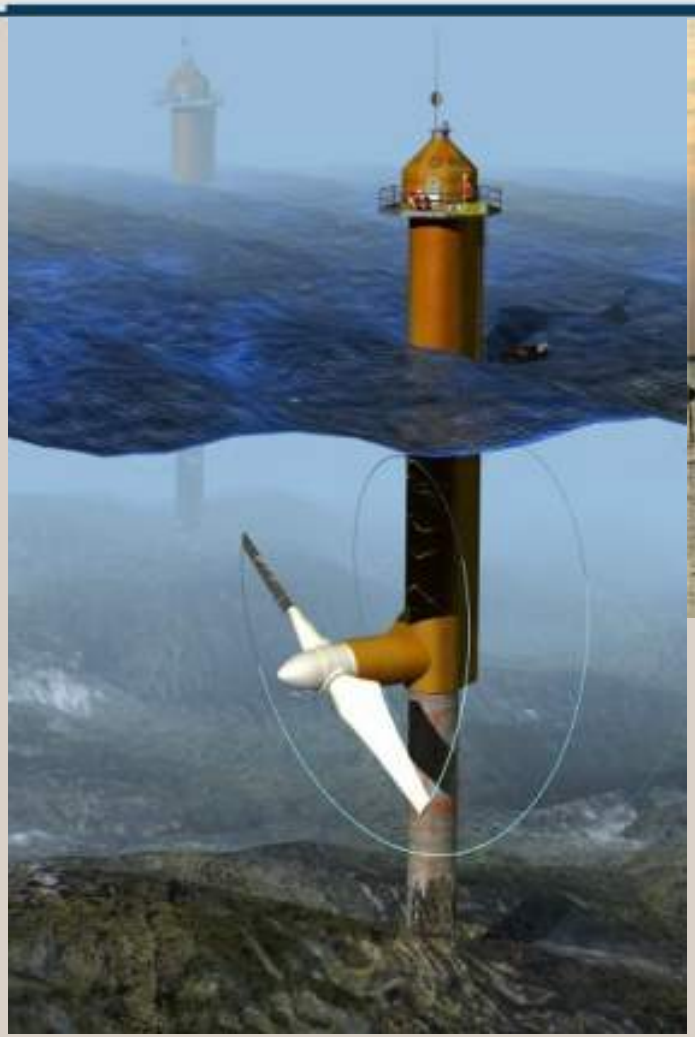
Hot rocks & Geo-thermal



http://wwwphys.murdoch.edu.au/rise/reslab/resfiles/geo/text_files/image011.j

Bio-energy>> methane cogeneration

Wave, Tidal & Currents



http://www.rise.org.au/info/Tech/index.html

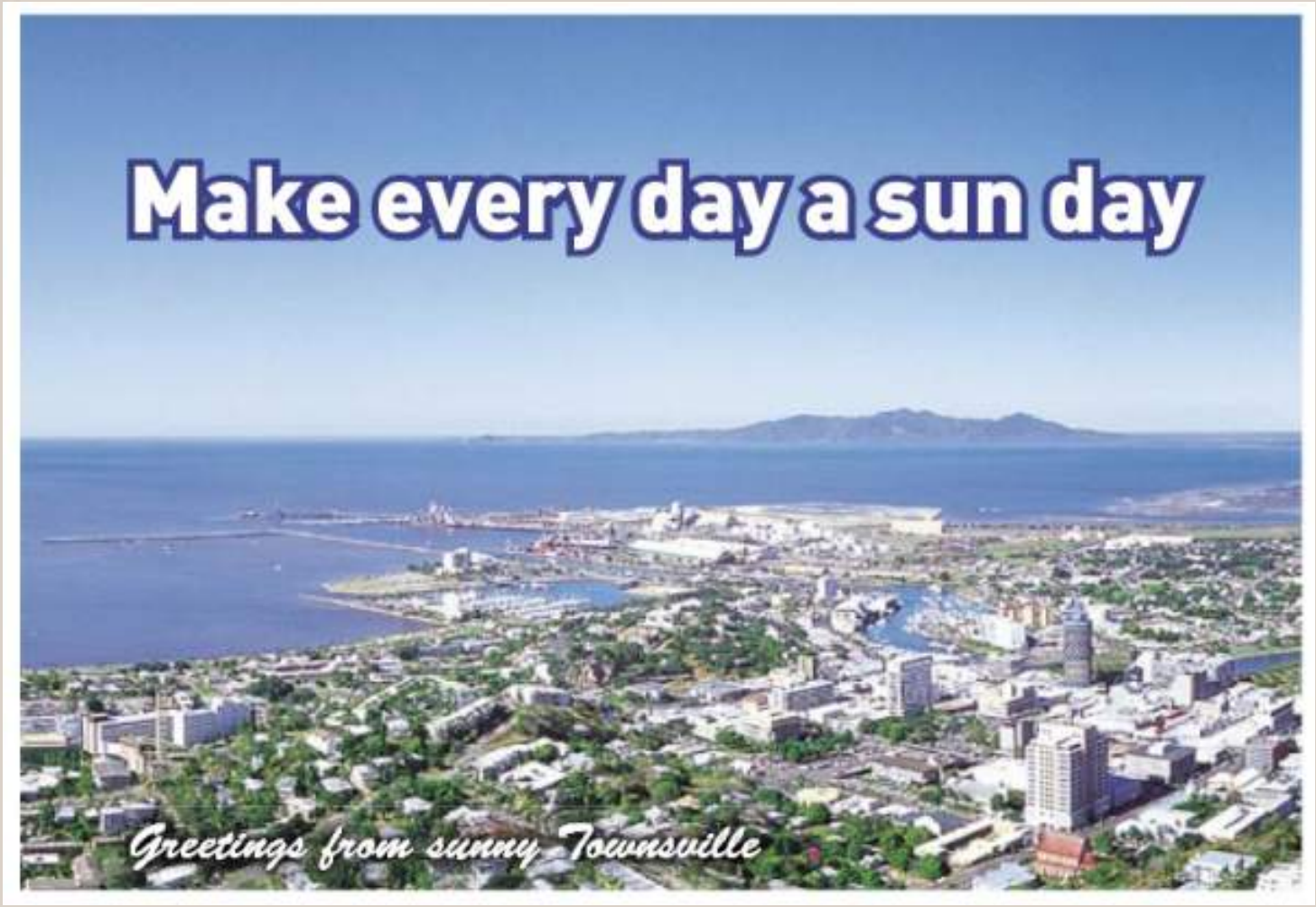
GreenPower >> Ergon Clean Energy

>> National accreditation programme for energy generated from renewable sources such as sun, wind, water and waste

>> Customers subscribe to the scheme from their energy retailer and pay from as little as $10 per quarter on their bill.

Contribution (per year)	Renewable Energy Purchased per Quarter	Greenhouse Gas Savings per Year (kWh = Kilowatt hours)	Equivalent to taking a car off the road for…
$10	333 kWh	1332 kWh	4 Months *
$30	1000 kWh	4000 kWh	12 Months *
$60	2000 kWh	8000 kWh	24 months *
$120	4000 kWh	16000 kWh	48 months *

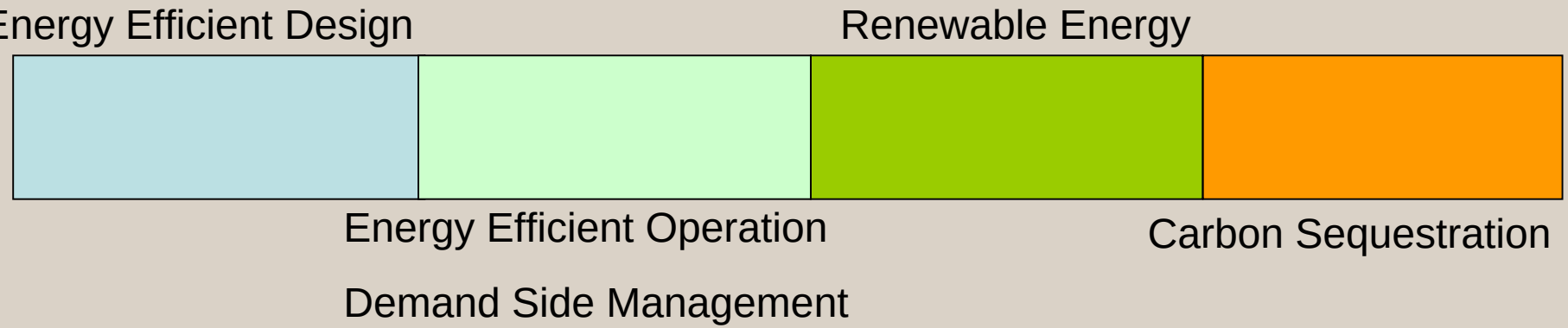
Progressing the vision of a Sustainable City



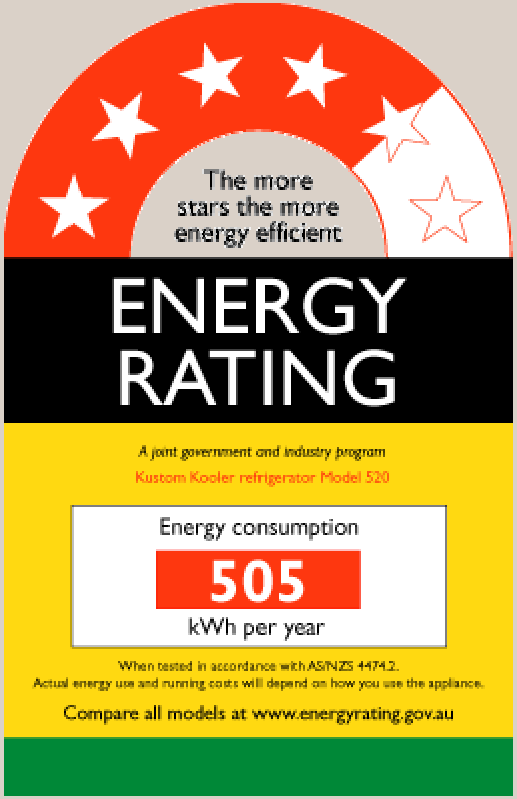
Individual and Collective Action & Responsibility

Mitigation – reducing our ecological footprint

Adaptation - building capacity to adapt to climate change effects



Informing our choices

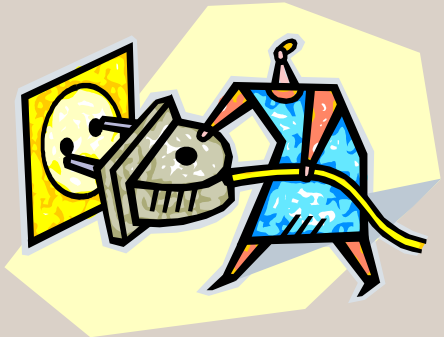


Stand-By Modes

>> Appliances that draw power 24 hours a day. These include TV, DVD, Phone Chargers, Microwaves, Stereo, Computer.

>> Can contribute towards approximately 10% of a household's energy bill.

>> Unplug or switch off appliances at the wall instead of leaving them on standby when not in use.



SUSTAINABLE LIVING

Ecologically Sustainable Design

>> Designing physical objects to comply with the principles of economic, social and ecological sustainability.

>> **Low Impact Materials** – non-toxic, recycled, sustainably produced.

>> **Energy Efficiency** – use processes and products that use less energy

>> **Quality and durability** – Longer-lasting products, replaced less frequently.

Ecologically Sustainable Design

>> **Design for reuse and recycling –** products, processes and systems should be designed for performance in a commercial ‘afterlife’

>> **Service Substitution –** Shifting the mode of consumption. E.g from private vehicle use to carpooling.

>> **Renewability –** Materials used should be local and able to be recycled when their usefulness has been exhausted.

How Much Stuff??

>> Reduce

>> Re-use

>> Recycle

>> Refuse

Picture source: Energy Action Australia
Slide: Wendy Miller

Buildings

Buildings

Source: Wendy Miller

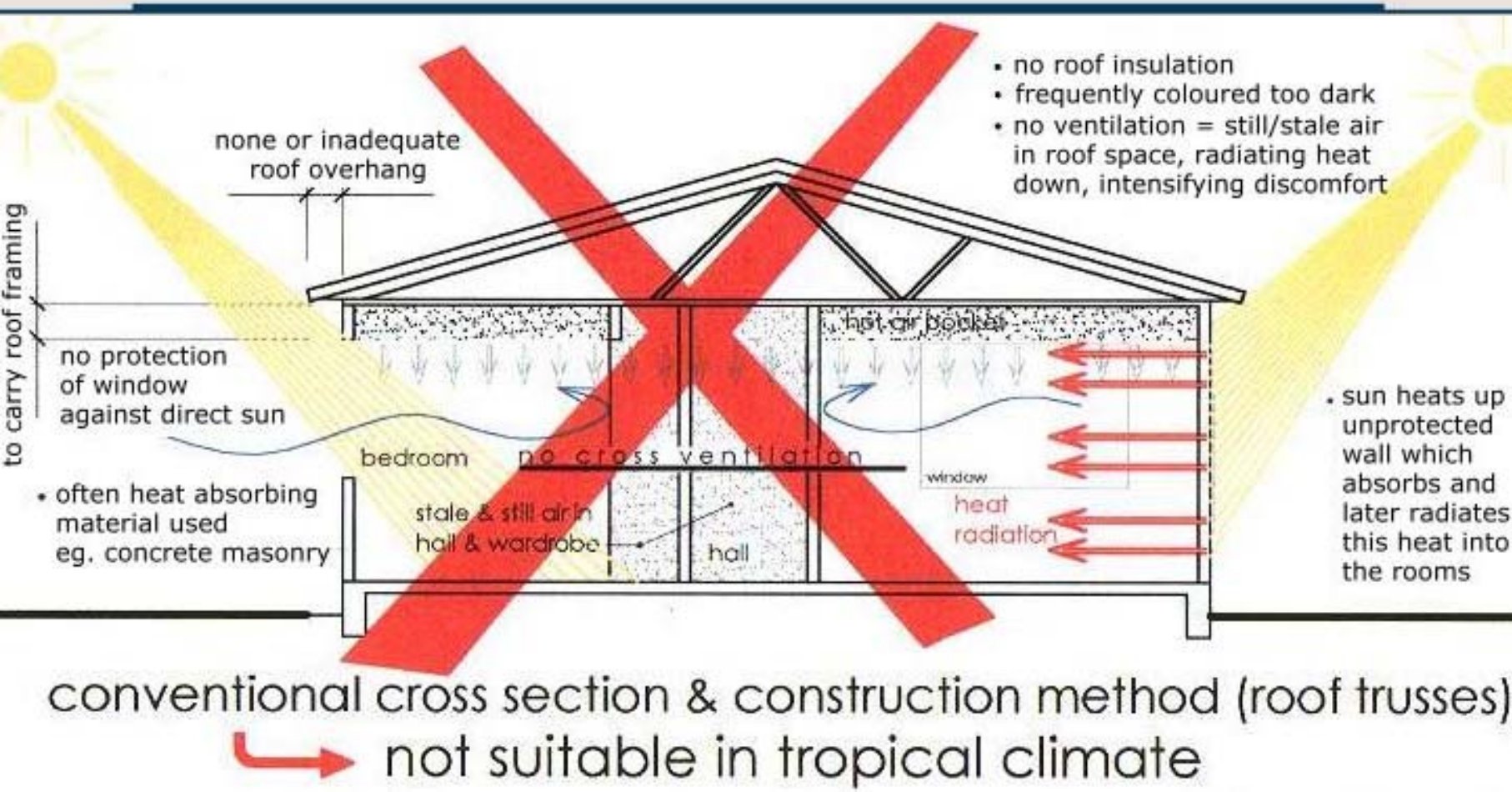
Around Town….

Green Eco-Scrapers

Shade – a natural way to cool homes

House Design – shape, size, comfort

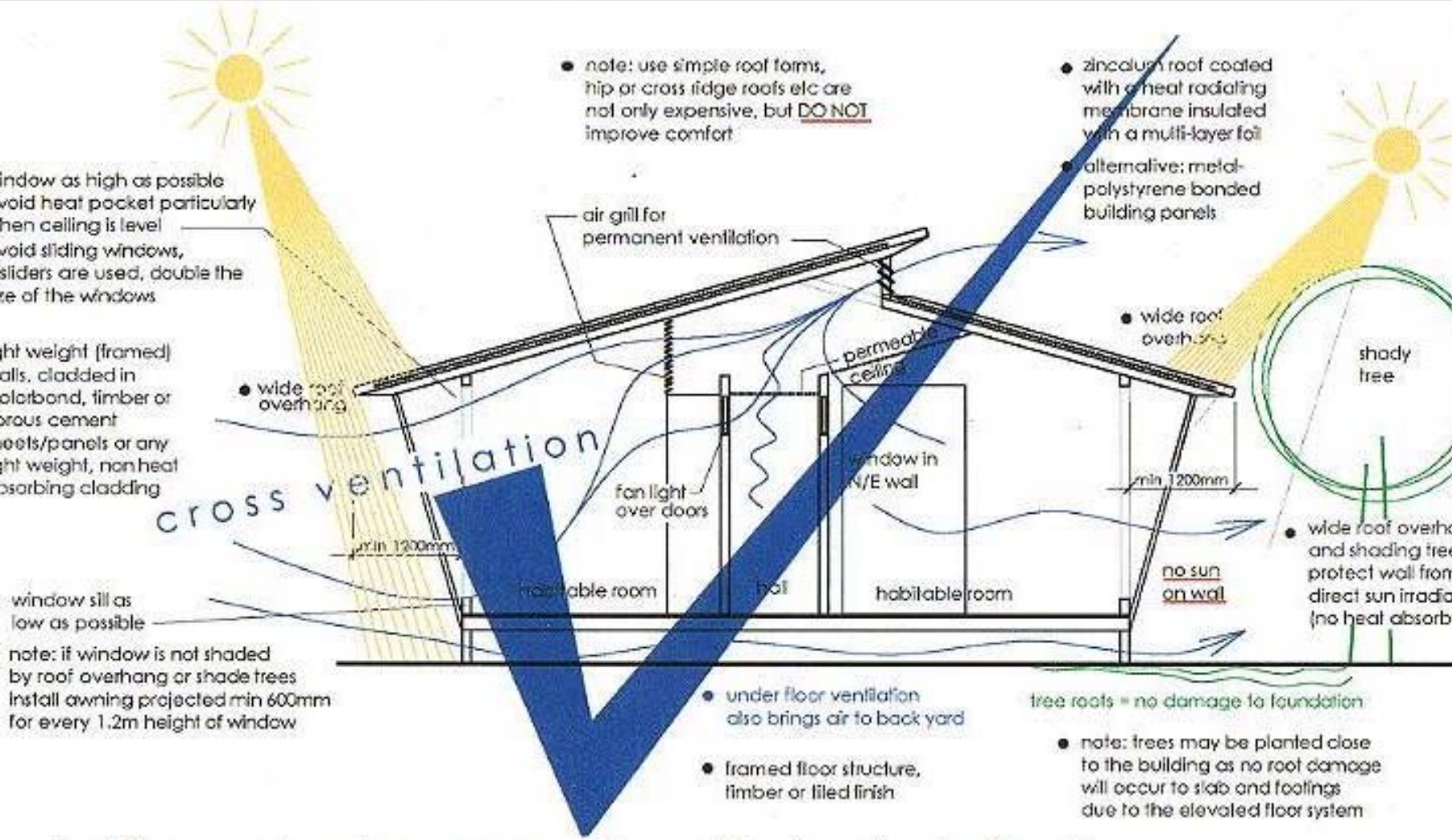
Home Design - What to avoid



conventional cross section & construction method (roof trusses)

→ not suitable in tropical climate

Home Design- What to aim for



portal frame structure → preferred in tropical climate

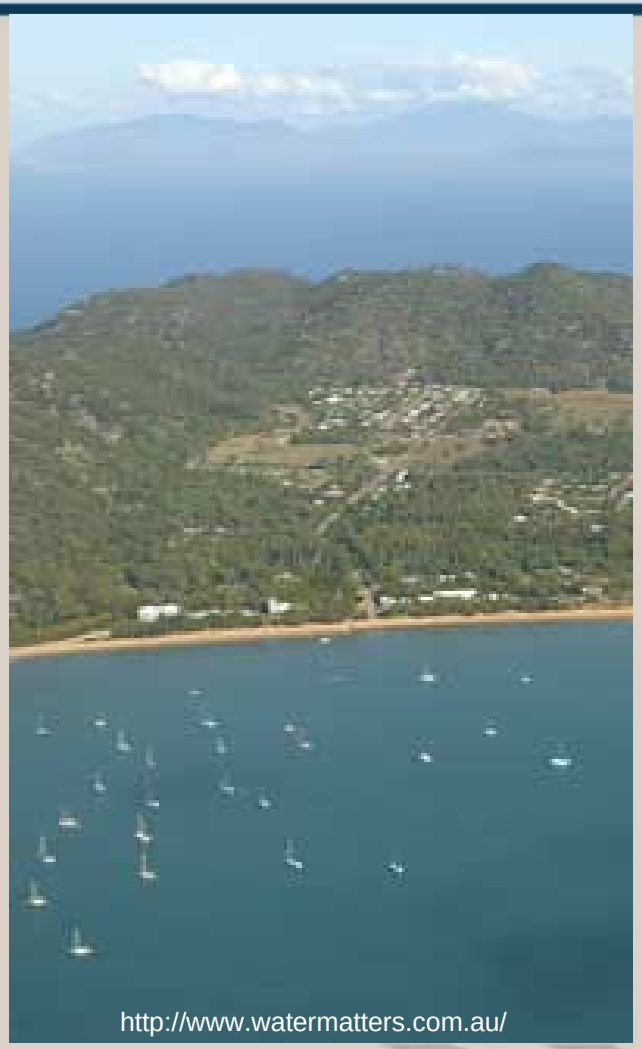
note orientation, shade & cross ventilation apply equally to single and multi storey developments

climate-responsive design for townsville/thuringowa
schematic cross section - recommended

Transport – Increase public transport, bike paths and walkways to reduce our reliance on cars.

tp://www3.iclei.org/localstrategies/summary/curitiba2.html

Water – innovative water recycling



Dongtan Eco-City, China – Example
Sustainable City

Townsville City Council Initiatives

SUSTAINABLE TOWNSVILLE >>

SUSTAINABLE TOWNSVILLE- Initiatives

>> Strand Wind Turbine
>> Hybrid cars and E10 (fleet services)
>> Water-efficient irrigation in parks
>> Water-efficient public pools and toilets
>> Citiwater methane capture project
>> Townsville Bikeways
>> TravelSmart
>> Stormwater Quality improvement (Water Sensitive Urban Design)
>> Sustainable housing
>> Alternative waste water technology

>> …and much more!

OUR MAIN PROGRAMS IN TCC-ISS

Integrated Sustainability Services

>> **Citisolar**

>> **Greening Townsville**

>> **Creek to Coral**

>> **+ Urban Nature…**

Solar City

>> Townsville won the Solar City bid last September!

>> Solar City is about developing solar power in the city of Townsville and fostering sustainable behaviour amongst the community

>> includes solar technology, energy efficiency, load management, smart meters and cost reflective pricing in large-scale grid-connected urban sites.

Citisolar

>> Citisolar is Townsville City Council's component of the Solar City
It is about involving the community in an energy-wise response to climate change

>> Council's Citisolar program is designed to:

>> Support the Ergon Energy led Townsville - Queensland Solar City project.

>> Be relevant to local government and support broader community interests

Greening Townsville

A commitment to the planting of 10,000 trees per year through shade tree plantings, free trees, revegetation projects, community and school involvement. Target areas include parks, streets, main roadways, industrial precincts, car parks, shopping centres, drains and waterways.

Greening Townsville

Greening Townsville Program has three main components:
>> Street trees and landscaping capital works
>> Community Greening
>> Schools Shade Tree and Greentree Ants

Greening Townsville Program is administered by Parks Services and Integrated Sustainability Services, implementing the Community Greening, Schools Shade Tree and Greentree Ants Programs.

Creek to Coral

- Creek to Coral is about Total Water Cycle management in the Townsville and Thuringowa regions
- It aims at enhancing our local waterways in the Coastal Dry Tropics
- It is about protecting biodiversity and ecosystem services of the coastal catchments, floodplains and wetlands




Creek to Coral

- Eco-catchment education tours
- Involving community groups in water quality monitoring (creekwatch, seagrass watch, CVA, Reef Check)

- www.creektocoral.org




Urban Nature

- Ecotourism in Townsville
- Urban Nature- Youth Ecotourism Forums and events
- Creating a network of local ecotourism operators
- Promoting Townsville as an emerging ecotourism destination

Levels of Change within Your City…..

On a Micro Level – You can decide to reduce your electricity consumption, recycle and practice water conservation around the home and workplace. Encourage your family, friends and co-workers to do the same.

On a Macro Level - Get involved in community and Council environmental groups and events.

To check out what's in your backyard, see
http://www.environment.gov.au/erin/ert/index.html

Your vision of a Sustainable City??

Competition Summary

>> Final Submission Date: 15th November.

>> Winners notified: 14th December.

>> Solar Cities Congress 17-21 February 2008. Winners will be flown to the conference.

>> For further information and to submit entries contact:

Competition Secretariat
2008 International Solar Cities Schools Competition
South Australian Department of Education and Children Services
GPO Box 1152 Adelaide SA, Australia 5001
Phone: 61 8 8379 8222 Email: schools@plevin.com.au