

A Global Warming Mind-Map

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(Copyleft: spread this as far and wide as you can)

Global warming seems such a huge problem that its easy to feel helpless, but in fact there are many things we can do on a personal level to help. A lot of them don't cost much, and many will end up saving money! Perhaps most importantly, we need to change our behaviour - and that's not as hard as you think.

Besides, if we don't rise to the challenge, climate change will force our hand anyway - most likely in ways we won't like. Already it looks like Santa Claus and the Elves will soon be living on a submarine for the summer. Toy production WILL be affected! The Stern report says that the cost of global warming could reach up to 20% of world GDP (Gross Domestic Product - a measure of economic activity) if we do not act. So the time has come to pull our collective fingers out. It doesn't mean we have to have sharp cuts in living standards, it does mean that we have to live smarter, and grow in a different way. More of the same is definitely not better.

The global warming mind-map shows some of the things we can do. Start by informing yourself. Watch Al Gore's (former U.S. Vice President) movie "An inconvenient truth". The Australian Greenhouse office has a downloadable PDF file explaining climate change science (www.greenhouse.gov.au/science/qa/index.html). Tanya Ha's book 'Greeniology' (www.tanyaha.com/Pages/books.html), has loads of useful tips for reducing your emissions, as well as water use, and living 'green' in general.

Most of our greenhouse gas emissions come from the burning of fossil fuels for energy. Thats where energy efficiency comes in. There is a wide scope for using less energy to do the same things, saving money and reducing greenhouse gas emissions at the same time. Many measures need none or little up-front money, but others need more. There will be a payback time before the savings overtake the initial cost, just as in any other investment.

Doing an energy audit on the home or workplace (www.greenhouse.gov.au/local/publications/audit.html) will help to prioritise the best ways to save energy. Using energy-efficient light bulbs and appliances, turning things off at the power point when not in use (standby power can add 5% to your bill), using a good old-fashioned clothes line rather than a drier, and installing insulation, all cut energy use.

One of the most energy-hungry appliances in the home is the fridge. In Melbourne, the "Phoenix Fridge" project (www.phoenixfridges.com.au) retrofits old fridges to make them more energy-efficient. The savings are two-fold. The house saves on energy and greenhouse gases, but factories also doesn't need to use energy to manufacture a whole new fridge, and no need to use energy disposing of the old one. The energy

consumption of many electrical appliances can be compared on-line at www.energyrating.gov.au. The pick of the bunch can be compared in detail at www.energyallstars.gov.au.

Installing enough grid-connected solar photo voltaic (PV) panels could make your house mostly energy self-sufficient, but there have been many doubts whether they will ever pay for themselves unless the cost of mains power rises substantially. However in the latest federal budget, the solar PV rebate has been doubled to \$8 per watt, up to a maximum of \$8000, and schools and community groups can now apply for a grant of up to 50 per cent of the cost of a solar power system, with an upper limit of two kilowatts. Also there are many new technologies on the horizon, for example 'silver cell' technology, that promise to reduce the cost of solar PV systems.

By the laws of thermodynamics, all fuel based electrical generating systems have a limited efficiency (often only around 35%), and inevitably make waste-heat as well. Usually even more energy must be wasted removing this heat with a cooling system. Combined heat and power (CHP) systems (also called co-generation) utilise the heat instead, thus improving efficiency and saving energy. This is impractical with electricity provided from huge remote power stations. CHP systems can be used on an industrial, commercial or household scale. If more electricity is produced than needed, it can be sold back to the grid, cutting the pay-back time.

One of the most cost-effective ways to reduce household energy use is to install a solar hot water heater. These save so much energy that they often repay themselves after a few years. Check out the Alternate Technology Association's website (www.ata.org.au) for details of home energy system rebates on a state-by-state basis. This website also has lots of other useful information. If you are building a new home, or renovating an old one, incorporate passive solar design. Tips can be found at www.greenhouse.gov.au/yourhome/technical/fs10.htm.

A phone call may be all it takes to switch to some form of "green-power". These are schemes set up by mains electricity suppliers whereby they guarantee that the amount of energy you use will be sourced from a renewable energy generator. Even though the actual electricity supplied to you might not be, it balances out. If 100% of electricity users choose green-power, then the supplier must source 100% of its electricity from renewable energy generators. For a typical house using about 6,700 Kilowatt-hours per year, the extra cost of green power is no more than about \$5.50 per week. A muffin and a cup of coffee! Find utilities offering green power in each state at www.greenpower.gov.au. Another way to make your money work for the planet is to invest in renewable power generation, which is growing strongly around the world. One possibility is Australian Ethical Investment (www.austethical.com.au), which offer managed investment and superannuation funds that include renewable energy, recycling, and green technology companies in their portfolio. Investment contributions can be as low as \$100 per month.

Homes are not the only greenhouse gas producers. Keep your car tyres well pumped up. You will improve fuel consumption and save money at the same time. If possible, make your next car a hybrid or all electric vehicle (EV). Currently the only models available in Australia are expensive, but expect this to change in the next few years (and don't think that EV's are all turtles. The Tesla Roadster EV (www.teslamotors.com) in the United States will drag off a Ferrari). An exciting development is V2G (Vehicle to Grid) technology. With V2G you can charge your car battery from the house (using green power or your own renewable power system of course!), use the car battery for household energy storage, and sell power back to the grid at peak load times.

Some service stations have begun to offer fuel blends with some fraction of biofuel in the mix. However there is much debate over whether biofuels are really greenhouse friendly, or even ethical, as carbon-storing rain forests may be trashed and food crops replaced to grow biofuel crops instead (www.biofuelwatch.org.uk).

Car pooling is a good way to reduce your car use, and make friends at the same time. Better yet, leave the car at home, and walk, cycle, or use public transport. They all save on energy use and provide exercise. Flying is particularly bad, so avoid it wherever possible, but if you have to, Virgin Blue airline is currently offering a carbon offset scheme (www.virginblue.com.au/carbonoffset).

Buying fresh local food, perhaps directly from farmers markets, cuts fossil fuel used in transport and refrigeration. Or grow your own! A surprising fact is that by simply eating less red meat, we can each save a lot of greenhouse gases. Going completely vegan can save more greenhouse gases than using a hybrid electric car. Vege-meals are in! The reason is that livestock belches out methane and nitrous oxide, both potent greenhouse gases, and also requires high energy inputs for food processing and to grow feed crops.

Everything we use takes energy to make, so reduce, re-use, and recycle instead. Recycling many metals and plastics uses less energy than to make from raw materials. Use a cloth bag for shopping instead of throwing away plastic bags each time.

Forests store huge amounts of carbon, but the world's rainforests and old-growth forests are still being trashed at an alarming rate. This must be stopped. You can help by using recycled paper and buying timber only from accredited sources. Greenpeace has a purchasing guide at www.greenpeace.org/australia/take-action/live-greener/shopping/goodwood-guide. And help nature suck back some of the carbon already released. Wherever you are, plant trees!

In fact, planting trees is one of the ways that "carbon credit" schemes operate. If some activity, for example driving a car or heating a home, does release carbon, then it is possible to make the activity carbon neutral by paying someone else for their carbon credits, whereby they agree to save or soak up the equivalent amount of carbon.

However care must be taken that the credits purchased really do lead to a reduction in emissions. Make sure the carbon credits are certified by a reliable authority. One such is at www.greenhouse.gov.au/greenhousefriendly. Gold standard accreditation (www.cdmgoldstandard.org) is an internationally recognised benchmark for carbon credit schemes. There are other greenhouse gases, such as methane and nitrous oxide, and they should be included in the accounting. Also, buying carbon credits should not be seen as a way to continue 'business as usual' instead of taking other concrete actions. Ultimately, the global capacity of greenhouse gas sinks are limited, so emission sources must be cut.

And until our economies are 100% greenhouse neutral, the more people there are, the more greenhouse gases will be added to the atmosphere. Population control is particularly important in countries like Australia, Canada, and the United States while we generate more greenhouse gases per person than anywhere else, but with a world population of 6.7 billion, and heading for 9.4 billion by 2050, we need to limit the number of children we have to an average of two or less per couple globally. Promoting access to education, job opportunities and family planning, especially for girls and women, can reduce birthrates. Improving childhood survival rates also reduces birthrate, as parents have less children if they are confident their kids will make it to adulthood. Get behind Medecins Sans Frontieres' (www.msf.org.au) plumpy-nut program! Help people around the world to develop sustainably without leaving home by volunteering online at www.nabuur.com. According to World Bank estimates, around US\$84 billion per year (0.2% of world GDP) is needed to tackle malnutrition and give a primary school education to every child on Earth. For comparison, the Iraq war has cost about US\$456 billion, or over US\$100 billion per year. The current world military budget is around \$US1 trillion per year. If even one tenth of this was redirected...

These are just some of the ways to help solve global warming. There are many others. Spread the word, talk to your friends, neighbours, workmates - anyone you know. And contact your politicians, planners and media outlets. Our leaders need to know what we want and that we care. Make them feel the heat! Writing many short letters with one or two points each is more effective than one long complicated letter. Don't be alone – climate action groups can be found at www.climatemovement.org.au. There is a cyber climate action campaign at www.getup.org.au (click on campaigns). Join the huge global online climate petition at www.avaaz.org and pressure world leaders into action. Speak out and be a catalyst. Our choices matter.

What will the future look like in a climate-friendly Australia? We will be more mindful of the services that energy provides rather than seeking to maximise energy production. Power supply will be more distributed, local, and small-scale compared to today's huge central power stations. The sun (which also drives global wind, water, and biomass cycles), geothermal power, and perhaps tidal power, will provide the bulk of our energy, while V2G cars, micro-hydro generators, solar thermal-stations, micro fuel-cells, and likely many other technologies will also provide local energy storage and match supply

with demand. The grid will be much smarter and two-way, more like today's Internet. Perhaps each home will generate most, if not all, of its own energy. Our communities will be "ecopolises" - designed or retro-fitted to be energy and water efficient, with green "smart" buildings, urban food gardens, permaculture in every nook and cranny, "walking city" urban centres linked by public transport, and much more cultural life. It is likely that we will no longer worship GDP but pay more attention to "green GDP" or a host of other indicators that measure the quality of economic activity as well as the quantity, and refer to sustainability benchmarks including greenhouse gas emission.

But who knows what life will really be like? Things are changing so fast that it is difficult to predict. Only one thing is certain: if we act now to put the brakes on climate change, we can face the future with excitement rather than fear. Make it happen!