

## Sustainable Living Programme

### Introductory background reading (2009)

Best viewed in colour - see maps.



### What is sustainability and how do we measure it?

When it is possible to meet human needs, globally and long-term, without overwhelming nature and society, we would be in a more-sustainable position than we are now. Un-sustainability is easier to measure than sustainability!

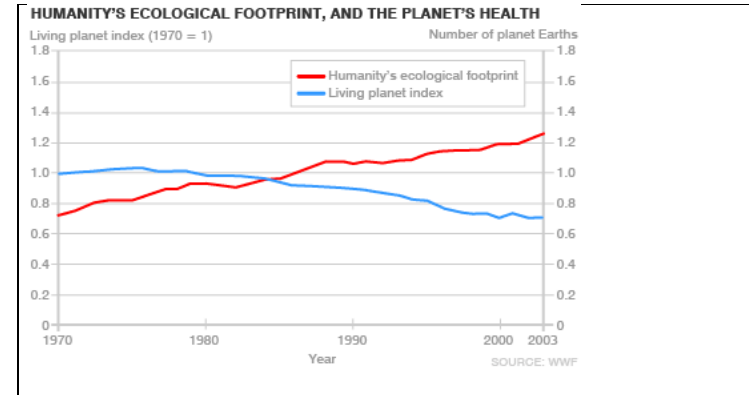
This century, humans are caught in a narrowing 'funnel' between a *decline* in the stock of natural resources and of working eco-systems which help to support life, and a *growth* in consumption rate of resources as our population and economic activity grows<sup>1</sup>. The relatively rich countries such as NZ consume more per-person but have low population growth, meanwhile poorer countries have growing populations of lower-level consumers, themselves aspiring to the consumption rates they see in rich (India, Brazil, China, etc). Together, humans have outstripped the annual biological-capacity of the Earth to supply us, moving from living on the 'income' of (ultimately solar-powered) annual production by plants, to the 'capital' of historic solar power stored in hydrocarbons (forest timber plus fossilized previous plant matter in oil, gas and coal) and concentrating other materials from the Earth's crust such as metals, some of which are toxic (e.g. mercury, cadmium, uranium).

WWF estimate humanities' combined demand by using an ecological footprint concept, which represents material demands in terms of hectares of land equivalent. By 2003, WWF says we were demanding the biological productivity of 1.2 planet Earths. Averaged across all populations, when some countries still have low demand, this means that the minority wealthy population live beyond their share, as if we have up to five planets available. Of course we do not, and need to rein-back our demand towards 'one planet living' to become sustainable (WWF Living Planet Report) [www.panda.org/news\\_facts/publications/key\\_publications/living\\_planet\\_report/index.cfm](http://www.panda.org/news_facts/publications/key_publications/living_planet_report/index.cfm)

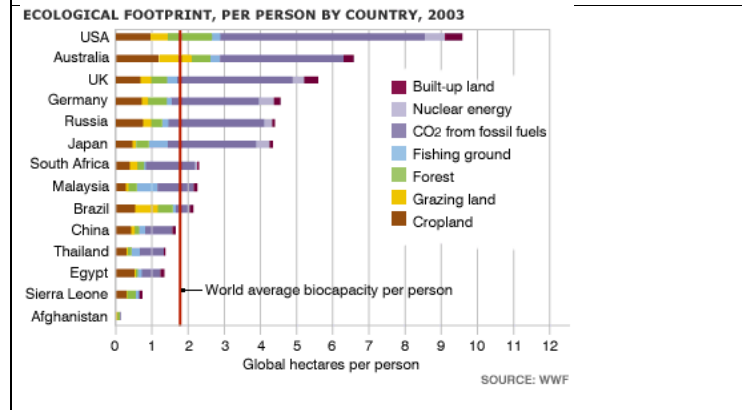
Two recently screened films, 'An Inconvenient Truth' and 'The 11<sup>th</sup> Hour' have alerted many people to the accelerating pace of global warming and its alarming impact on polar ice melt, rising sea level, stormy weather patterns, spread of deserts and loss of some areas ability to produce their current food crops. A new film in 2009 'the Age of Stupid' continues this message. What can we do here, in response to this knowledge? Firstly, we could become

<sup>1</sup> For more on this 'funnel' concept see [http://www.naturalstep.org/com/What\\_is\\_sustainability/](http://www.naturalstep.org/com/What_is_sustainability/) and for an explanation of the greenhouse effect try the BBC's animated website: [http://news.bbc.co.uk/1/shared/spl/hi/sci\\_nat/04/climate\\_change/html/greenhouse.stm](http://news.bbc.co.uk/1/shared/spl/hi/sci_nat/04/climate_change/html/greenhouse.stm)

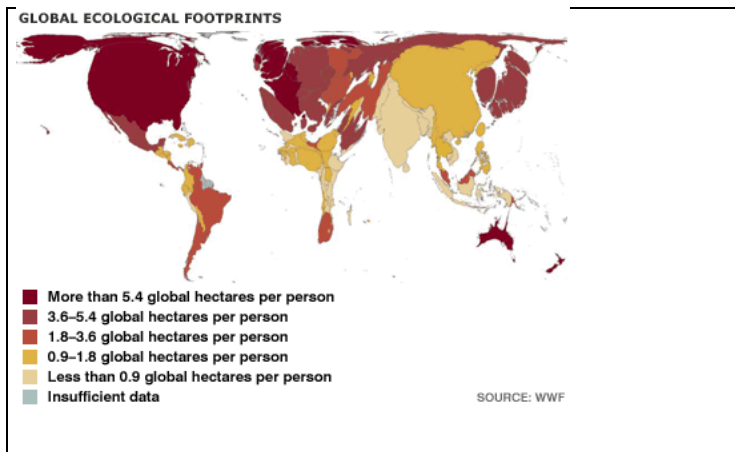
aware of how New Zealand's weather patterns may change: such as a wetter West and drier East, and begin adjusting our farm practices and city lifestyles. The NZ Ministry for Environment has official information available: [www.sustainability.govt.nz](http://www.sustainability.govt.nz)



Whilst the ecological footprint rises (red line), the WWF 'Living Planet Index' as an indicator of the ecosystem health (the initially higher blue line above, reading from the left), by 2003 had fallen by 30% relative to its state as assessed in 1970 (= index of 1 in that year).

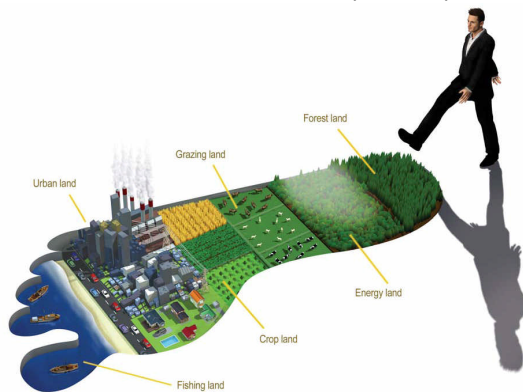


These differences can be expressed as maps, area proportionate to per-head demand upon global resources, expressed as Hectares (below). Note that NZ is found among the highest demand countries, along with Australia, USA & Canada, UK and France.



Auckland Mayor Dick Hubbard, speaking at a public meeting on 'Sustainability using The Natural Step' in October 2006, said "All of us, wherever we live, have an interest in sustainability." New Zealand's Prime Minister in 2007, Helen Clark, joined the British PM's claim that climate change is a most important public issue, and embarked on policy initiatives including support for householder education on sustainable living and encouragement for Government Departments to 'walk the talk' internally too, called Govt<sup>3</sup>. (In mid 2009 the incoming Government has scrapped the Households team at MfE and the Govt<sup>3</sup> scheme.)

Picture below from MfE shows how a 'footprint' comprises many impacts:

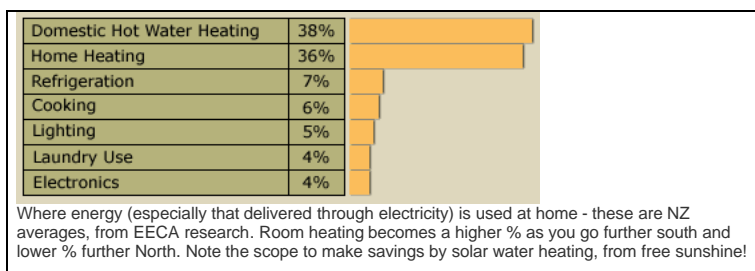


## A first step on making change towards sustainability is to know what impact we have now.

What will conveniently indicate our consumption rates and waste of natural resources, and in particular the rate at which we use and release fossil carbon - the main source of today's greenhouse gases? What could you measure?

- 1. Private car use.** We could measure kilometres traveled, or litres of fuel purchased (the most accurate), or cost of fuel purchased (only if noting the price per litre). Also relevant is how many people travel together - car sharing is more efficient than traveling alone. Three in a car is similar to bus efficiency. How you drive has an impact, as well as size and type of car. A useful calculator is available at this site: [www.fuelsaver.govt.nz](http://www.fuelsaver.govt.nz)
- 2. Public transport use.** Kilometres traveled, plus an average of how full the transport is (a near-empty bus is heavier and thus using more fuel, than a car, but is more efficient once there are a number of passengers on board).
- 3. Air travel.** This is the most carbon-hungry mode of travel, and especially on each take-off. Exhaust water vapour-trails left in the high-atmosphere also exacerbates their greenhouse gas impact. An overseas holiday has same atmosphere impact as months of daily car commuting. Try using carbonZero website calculators to see what the carbon impact of your travel has been.
- 4. Waste that reaches landfills** produces methane.<sup>2</sup> We could measure the putrescible, carbon-containing household waste (paper, food scraps, garden cuttings), by weight. Positive alternatives include composting, which captures carbon into useful soil humus and also converts some into carbon dioxide instead of the more-damaging methane created in airless landfill.
- 5. Fossil fuel use for home and water heating and light, and appliances.** Coal, gas or oil release carbon when burned, in contrast to electricity generated by hydropower, geothermal, solar energy or wind, which do not when operating, although there's some carbon release during their construction (e.g. from cement, steel and transport). Electricity and Gas bills inform monthly, but many retail companies estimate in alternate months - regular meter readings, taken by you, are recommended.

<sup>2</sup> When waste materials are compressed into an airless landfill, without oxygen, they break down to produce methane gas and toxic liquids. Methane gas leaking back into the atmosphere from landfills is, molecule for molecule, a much more potent greenhouse gas than carbon dioxide. In response, either methane should be collected from sealed landfills to burn as a fuel, which converts the carbon to CO<sub>2</sub>, or waste that could putrefy should be kept out of the landfill entirely and composted with air instead.



6. **Energy used in construction** of the house, vehicles and other materials. When we build or alter a house, change the car, or buy whiteware, we make choices about how much energy was accounted for, or 'embodied', in their construction<sup>3</sup>. This is the most technical and hardest to measure.

We suggest Sustainable Living course participants try using a **calculator of domestic carbon use**, offered in collaboration with CarboNZero (a service of Landcare Research Ltd.) Their website version is at: [http://www.carbonzero.co.nz/calculators/calculators\\_home.asp](http://www.carbonzero.co.nz/calculators/calculators_home.asp) Enter SL before your user-name when registering, please.

**Would you respond to the challenge of reducing the annual number of tonnes of carbon dioxide that your lifestyle emits?** What target would you set for yourself or your household - how many tonnes?

Whilst on the 'web' you could also try the [sustainable living](#) quiz on a wider range of topics. That page links to 'issues' background reading such as this, on several topics (download as PDF files)

**Sustainable Living evening classes** are available at high schools and other venues across the country (26+ councils are now involved). Typically, they run for one term, seven to ten tutor-led sessions of two hours each. They have to be pre-booked, the fee including extensive notes on paper or CD, and involve a group of 8 to 12 people who share your interest. The content covers practical action on how to make changes and choices leading towards sustainability, within this consumer society. Topics include: energy, waste, water, building, gardening, shopping and travel. The group discusses why, and options on how best to change, and shares experience on trying to do so. It is a fun way to learn. Register your interest in receiving details of the next classes offered in your area, direct on the Sustainable Living website: [www.sustainableliving.org.nz](http://www.sustainableliving.org.nz) or write to: Freepost SUSTAINABLE, PO Box 13-121 Armagh Street, Christchurch 8141.

<sup>3</sup> Concrete, aluminium and steel are energy hungry, for example. The energy used in all processes of manufacture of a motor car, going back beyond assembly to smelting the metals from ore and converting oil to plastics, is roughly equivalent to the energy it will use in fuel during its working life. New Zealanders are among the world's highest, in average number of cars owned per household.