

Green technologies for sustainable communities

Permaculture

Bill Mollison, David Holmgren and Robin Francis are amongst the most creative earth repair people on our little planet. Unlike most scientists, they work with, rather than against, nature to bring back trees and animals into landscapes to create sustainable land use systems.

The main criticism of 'Permie's' is that they span the world spreading weeds. While this may be true in some cases, they also span the world teaching and bringing back degraded land to health! The CERES environment education centre in Melbourne was once a disused

mine site and rubbish tip which spewed toxic gas into the air and occasionally self ignited. It is now the premier ecological site in Australia, which features many aspects of permaculture.

Equally, Northy St City Farm and Beelalong Community Farm have been transformed from waste land to highly productive inner city examples of permaculture.

Bill Mollison maintains that the only way to change humanity is to build gardens and often dismisses politics. The

fact is that radical political change must happen if we are not to end up like the dinosaurs. Certainly sustainable land use systems must form the cornerstone of sustainable communities but we also need to economically democratise society so that resources and wealth are shared according to the hours of labour spent repairing poor old Mother Earth.

I have divided the rest of this article into the different disciplines for the construction of sustainable human communities. I have also tried to look at solutions rather than dwelling on the very obvious causes of current human land use and degradation.



CSIRO LAND AND WATER PHOTOGRAPHY BY GREGORY HEATH

Water



No water – no life! In cities we need to capture the maximum amount of water from roofs into tanks and ponds. Where possible treat grey and black water on-site and re-use the treated water for the garden or re-flush toilet water.

Storm water from roads must be cleaned and used on parks and inner city vegetable and fruit tree farms. In short, capturing the water in and close to the city and totally re-using spare water for aquatic and land food production.

In 2000 years humans have managed to create deserts and the destruction of the majority of forests. The simple and plain fact is that if you chop down trees you create deserts and destroy the water table. Farmers who want to bring water back will need to plant many millions of trees along contour lines, creeks and rivers, build swales to force water back into the ground and deep-rip paddocks to break up the hard pan caused by overuse of heavy machinery and hooved animals.

P.A. Yeoman's book *Water for Every Farm* is a must read for any farmer wanting to bring their farm back to natural fertility.

Land Use

The key to sustainable land use is of course the prudent storage and re-use of water. Degraded land can be bought back to health providing you have access to water and use it wisely!

City Land Use

Australian cities and many other global cities still have considerable amounts of land that can and should be used to store water and produce food. The fact is we currently use fossil fuels and other countries' cheap labour to sustain city food and consumer needs. It is a sure sign of a stupid economic system that transports food from the poor (who are starving) to the rich (who are fat) and puts local farmers off the land because they can't compete!

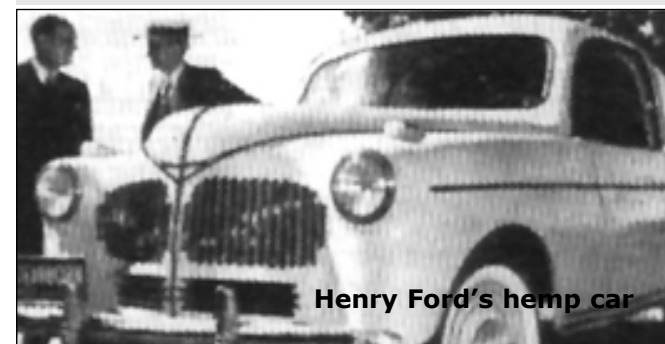
Havana City now produces about 30% of their food needs close to the city. This has freed up rural farmland for other uses such as bio-mass farming. We may well find ourselves trekking off to Havana to see how we can produce, market and preserve food for city use.

Farm Land Use

Maximising food production in and close to our cities will free up many thousands of hectares of rural land, allowing us to use farmland to grow bio-mass plants and trees to produce biodegradable consumer goods.

Anything made from oil can be made from plants, therefore much of our consumer goods can and must be made from renewable crops and trees grown sustainably on farms. This will bring back rural wealth and allow farmers to repair their farms back to sustainable productive use. Hemp, soy, corn and olive trees are all plants that give good amounts of bio-mass and can help to restore soil structure and fertility to degraded farms. It is surely one of the great crimes of successive American administrations to keep prohibiting hemp, the world's most useful agricultural crop!

Of course hemp alone can't save the world, as many enthusiasts claim, however it is the world's most useful bio mass plant that can supply the raw materials for paper, bio-plastics, ethanol and a huge variety of consumer and industrial goods – from the farm gate!



Henry Ford's hemp car

Solar reflectors

Solar reflectors use the sun to concentrate energy onto a small area to drive a motor such as a Stirling or an electrical converter.

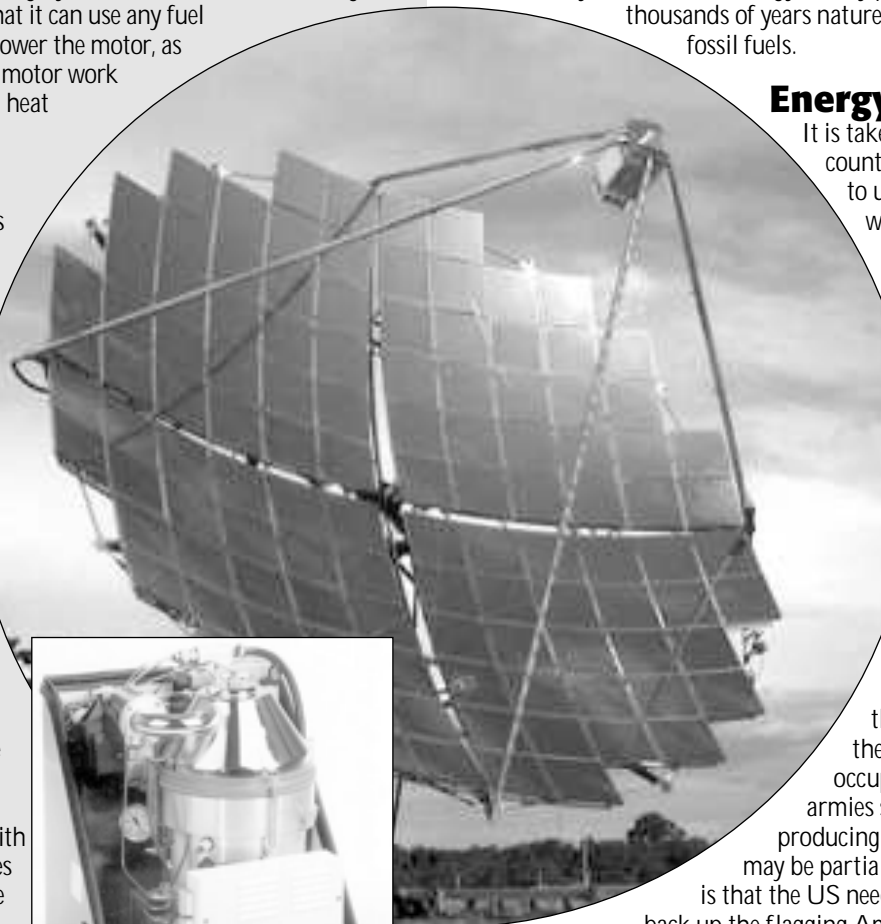
The Stirling engine is old technology that has been modernised by NZ engineers into a highly efficient form. The advantage of a Stirling engine is that it can use any fuel (including the sun) to power the motor, as the energy to make the motor work comes from an external heat source.

They are relatively expensive, but highly reliable. Of course mass production in China would see a rapid decrease in per unit cost price.

Both the above energy systems need a storage system, which has been developed in Australia over 15 years by a scientist at the University of NSW. Dr Maria Kastavali is the inventor of the Vanadium Redox Battery. Currently the Vanadium batteries are used for large energy storage systems such as wind farms, however with some R&D the batteries could be reduced in size for home and vehicle power.

Basically the battery uses Vanadium to store energy. The advantages of the battery is that they are:

- Ecologically friendly
- Can be rapidly charged and discharged.
- Can be used as a fuel source for vehicles in that flat fuel can be exchanged for charged fuel leading to no pollution or contamination if the fuel was charged using the sun!



The Stirling heat engine

Energy & Peak Oil

It is taken humans in rich countries about 100 years to use up about half the world oil reserves. Half is left, so what's the big deal? Well the half that's left is far more difficult and expensive to recover: in fact much of it (hopefully) will probably never be used. The problem is that supply is rapidly declining and demand is rapidly increasing.

Many people believe this is the reason for the US administration's occupation of Iraq and its armies stationed in most oil-producing countries. While this may be partially true, the real reason is that the US needs a solid resource to back up the flagging American dollar. Since it was forced to withdraw the gold backing from the dollar in the 1970s, there was not enough gold in Fort Knox to support its currency! Oil is probably the last reserve for the US dollar. If the US administration controls world oil, they indirectly control the world economy. Hence spending billions of US tax payers' money on armies of occupation.

We currently have the technology wisdom and know-how to:

- Re-design cities to vastly reduce energy needs
- Localise energy and food production
- Introduce green technologies to make bio-regions economically sustainable so that rich countries don't have to plunder the resources of poor countries.

Energy

There are three major technologies that have been developed in New Zealand, Australia and the US that have the potential to supply clean green energy to all human being providing we use it sparingly and sensibly!

Cheap energy worries me far more than running out of oil! It could mean that we just go on building stupid unproductive freeways and destroying more productive land for suburbia. The real key to sustainable energy use is making cities car-free and making roadways too narrow for cars. Then, replacing the freeways with light rail and bus transport and planting fruit bearing trees along the unused car lanes.

Public transport and bikes would then become the main form of transport. My 'Chic Magnet' machine (pictured) is a far more pleasurable form of transport and the local women are always begging me for a lift. Once I have a carrier I will be the envy of every young petrol head in Nimbin.



Above: The author, Wayne Wadsworth, with his 'Chic Magnet' and friend

Below: Nimbin's own Rainbow Power Co



Economy

We are told daily that the economy has to grow or the world as we know it will come to an end. That is very true in respect to the way we organise our economy and the social constraints placed on creativity by very large companies and their representatives in councils, state and federal Governments.

The perverted forms of state-run socialism and Communism obviously failed miserably! They insisted on ever-increasing growth in the economy by rapidly industrialising, and destroying much of the natural wealth that helped them industrialise. The other obvious problems were over-centralisation and the growth of huge bureaucracies that stifled creativity and initiative in red tape and paperwork.

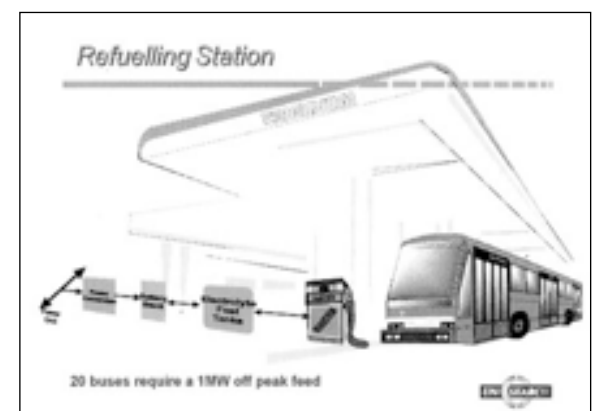
Like lemmings are we doomed to charge over the cliff face to our death, or can we slow down and do a u-turn by reducing population and demand on natural resources? If not, let's speed the march up so that at least a few other species can survive human passivity!

I believe there are enough enlightened human beings to turn the Titanic around and start building sustainable communities based not on globalisation, but localisation.

Those of us who believe the ship is salvageable need to not only talk about ecological sustainability, but build examples of sustainable land use so that other people can learn how to build and maintain their own sustainable systems. These systems would of course be vastly different to the current systems in that they would produce the vast majority of their needs as close as possible to where they live.

Of course this would not exclude international travel and international friendship, indeed it would foster a method to share resources by sharing know-how on regenerating Mother Earth back to health. International trade would of course still happen, but on a vastly different platform of sharing knowledge and resources to create localised wealth.

There are very few examples of an international cooperative system, however that does not mean we as the 'most intelligent species on earth' could not build such a society.



Green politics

Like most political parties, the Greens don't profess to have all the answers. However they still have not become party machines like the Liberal, National or Labor parties.

There is, I believe, time for political parties to develop policies to reduce and reverse continued and increasing consumption while maintaining a very high quality of life. The Greens have a very comprehensive website at www.greens.org.au.

Individual Change

No individual can change the direction of all humanity, however we can change our own behaviour and if a large minority change their behaviour they become a force to be reckoned with. So be a green revolutionary!

- Grow some vegies
 - Plant some fruit trees
 - Go solar
 - Buy a pushbike and pedal your way around
 - Promote localisation
 - Build small businesses and large co-operatives
 - Put your money into a credit union
 - Join a political party and promote policies that encourage sustainable living systems, decentralisation, bio-regionalism and localisation as opposed to globalisation and privatisation, and support community ownership and control of resources, finance and banking
 - Think globally and act locally.
- The Titanic has not hit the iceberg yet, it melted!
Viva!

In the next issue we will look at Nimbin as an Eco Village.

Housing

Housing in the City

The housing that dominates the land from the Gold to Sunshine coast is an exercise in bad design and the perfect method for destroying productive land. The majority of houses are badly designed, grossly oversized and take large horsepower air conditioning to keep the houses in liveable condition. A little planning and foresight could and should have seen a vast reduction in the land used to build the houses. At least to have solar passive design as a minimum requirement.

Of course developers and government speak with the same tongue when they say "that's what the people want." Of course people will want 'Mc Mansions' if that is what they are told is the fashionable thing to have, just as they eat McDonalds and get fat and overweight.

The real question is: do we elect governments to follow the Mac everything trail, or to plan systems for healthy living?

The Federal, state and local government all rabbit on about sustainable development and greenhouse gas reduction, but with the exception of a few councils and a state governments, it is business as usual.

City housing must be seen as part of a sustainable system where we:

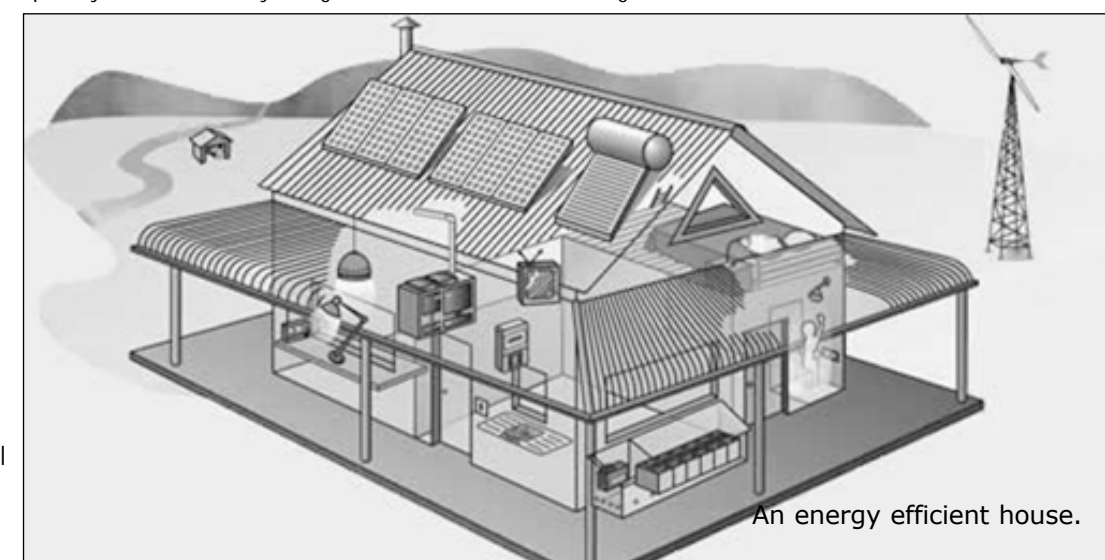
- Use nature to passively heat and cool the house
- Capture our own water

- Treat and reuse grey and black water
- Maximise food production
- Produce excess energy on site for home use, to power small lightweight vehicles and to dump any excess energy into the grid for industrial use.

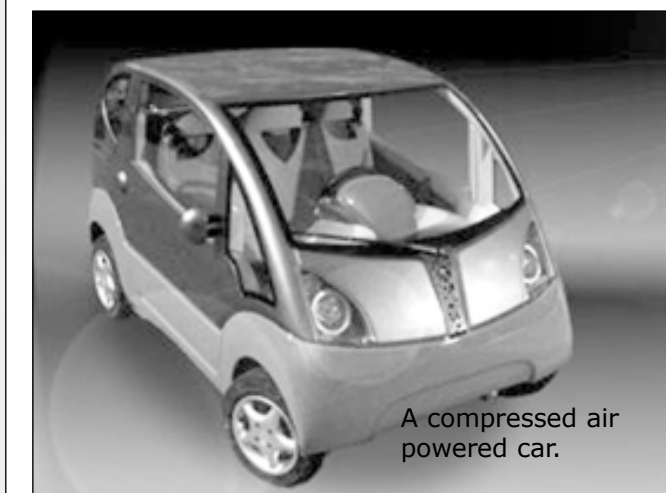
The above technically achievable measures are less expensive than what we spend on military might to steal other nations' oil.

Country Housing

One tiny tiny advantage of user pays systems is that it has become economically unviable to connect mains power to many rural areas, meaning that solar power is cheaper than mains. As farmers switch from chemical farming to sustainable farming, the areas around many of their houses will change from semi-desert to house-food production, similar to city houses which practise sustainable living.



An energy efficient house.



A compressed air powered car.