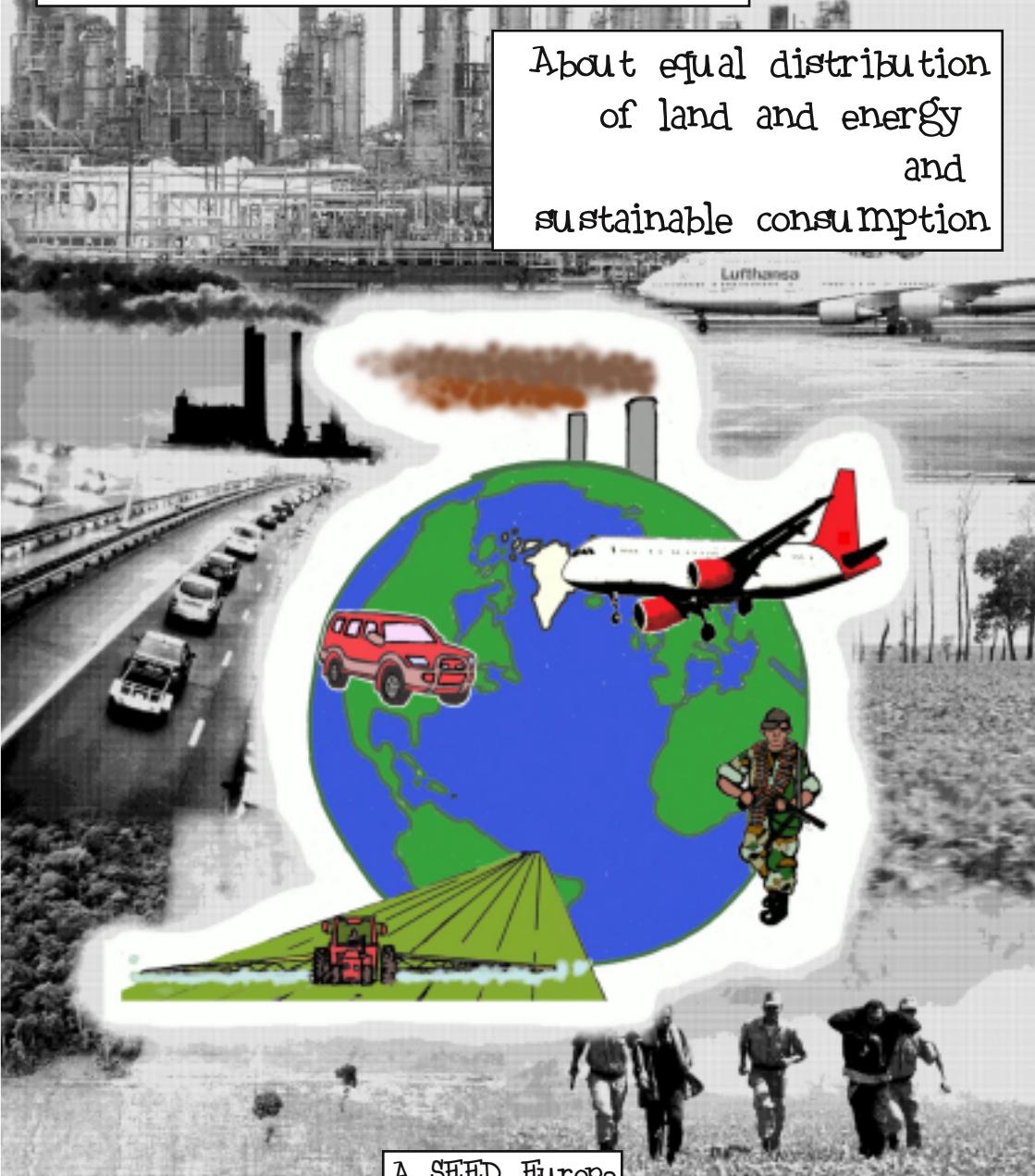


Agofuel

no cure for oil addiction
and climate change



About equal distribution
of land and energy
and
sustainable consumption



Start here

These days you can hardly ever pick up a newspaper without seeing an article about high oil prices. And television news constantly warns about our dependency on energy from unstable or 'unfriendly' regimes, which raises the oil price and makes people feel insecure about the reliability of supply. It raises the question "Will the supply be able to meet the growing world wide demand for oil?" Two years ago hardly anybody had heard of the issue. Now there is no family gathering without a discussion about 'peak oil'.

And then there is climate change, a problem that suddenly became popular after being ignored by politicians and companies for more than 15 years. Agro-energy is being presented by the powerful as a solution to both the oil and the energy crises. However, over the past year more and more people are realising that this 'solution' is as bad as the problem it is trying to solve. Still, it is hard to stop agro-energy development, partly because other solutions require more serious changes of society, particularly in terms of consumption. In this brochure we hope to show not only that such change is absolutely necessary, but that living a sustainable life in a sustainable society can be fun and very rewarding.

Definitions

The whole issue of agro-energy is not at all simple. There are many kinds of biological products that can be used to provide electricity, fuel or heat.

Such basic fuels may be especially produced for this purpose, OR they could be by-products or 'waste' from other processes.

Basic biological fuel matter may be produced on a very small scale, OR on an enormous scale, for local use OR for the world market.

To make clear exactly what we are talking about, first we need a list of definitions:

biomass = Plant material, vegetation, or agricultural waste used as a fuel or energy source.

agrofuel = Solid, liquid, or gas fuel consisting of, or derived from, biomass.

biofuel = Word used by the industry for agrofuel to make it sound more green and 'organic'.

agro-energy = Energy made available from biomass. Besides fuel this can also be the generation of electricity (greenwash variant: bio-energy)

bio-diesel = A diesel-equivalent processed fuel derived from biological sources (such as vegetable oils). Agro-diesel would be more accurate but the term bio-diesel is more commonly used.

ethanol = Also known as ethyl alcohol or drinking alcohol, but increasingly is used as fuel. Ethanol can be mass-produced by fermentating sugar.

pure plant oil = straight vegetable oil = Fuel similar to vegetable oil for cooking. Too thick for normal engines.

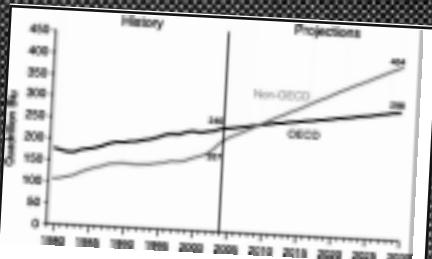
first generation (agrofuel) = Making diesel out of the oil in crops or making, ethanol from carbohydrates. This is a relatively simple process, but is not very efficient.

second generation (agrofuel) = Here the cellulose (woody parts) are used to produce fuel or gas.

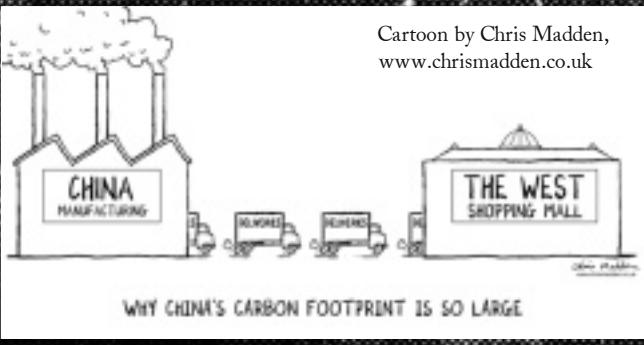
In 2004 the world total consumption of energy per year was about 470 ExaJoule:¹ in other words 470 with 18 zero's, or 130555 terawatt-hours. It is virtually impossible to imagine how much this actually is. It is equivalent to using 1948 litres of oil per person world wide. The per person figures are lowered as people in the global south still use much less oil than people in the west. Also the figures vary depending on the definitions each organisation uses, and different units of measurement are used, which makes it even more complicated.² But however we look at it, it is more energy than can be generated in a sustainable way.

The difference between energy consumption in 'western countries' and the 'global south' underlines the need to change things in our own region and society. With huge differences in wealth corresponding to energy consumption, this is not the time for westerners to tell others to reduce their emissions without setting a good example first.

The use of energy - World wide -



Energy use is still going up, both in the West and Elsewhere.² (1 Btu = 1055 Joule) This graphic shows that the forecasted energy demand the OECD (Western industrialised countries) and even more the non-OECD will be increasing in the coming decades. These figures only calculate the energy being formally traded on the „market“.



Cartoon by Chris Madden,
www.chrismadden.co.uk

Looking at a country level it is important to realise that a big part of 'our' energy use in the west actually occurs in other parts of the world. All those Chinese (and other) factories are producing for the west. We are 'out-sourcing' our pollution, to use an economic term. But we can't outsource our responsibility!

1) Source: Energy Information Administration (EIA), International Energy Annual 2004 (May – July 2006), website: www.eia.doe.gov

2) See: www.unitconversion.org/unit_converter/energy.html

3) picture from: <http://www.eia.doe.gov/bookshelf/brochures/ieo/index.html>

However we calculate it, and whatever unit we use (Exajouls, Btu, kilowatt, kgoe etc.), we use a lot of energy. And it will get worse: for the coming years global energy consumption is expected to grow at 2% a year.¹

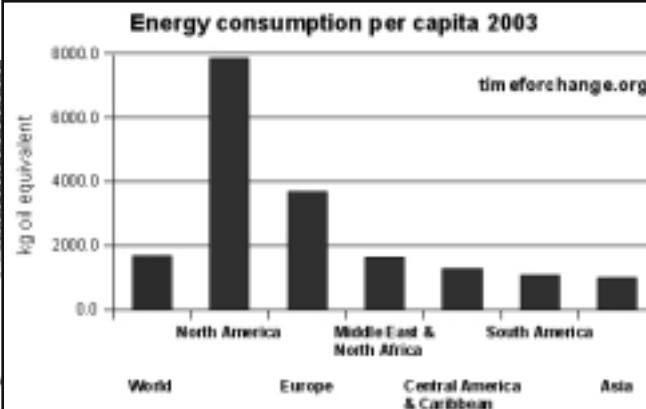
But let's get more personal, and work out what energy you as an individual use. Most obvious is direct consumption: your use of petrol, electricity and gas. But the energy necessary for the other activities in your life also should be counted. For example, the plane fly on to go on vacation, and the production of the computer you are using², the clothes you are wearing, and the can you are drinking from. This is called embodied energy.

To really calculate the average energy used per person, it is necessary to include general energy used in society for things like road building, heating schools and government buildings and going to war. [You can disagree on how necessary some of these products or activities are, but then do something about it! Don't let the government in your country pollute more through activities you don't agree with.]

The use of energy

- Per Person -

In order to produce one drinking can about 2000 Joule are necessary and another 260 Joule for further transport. For a 25 gram weighing can of 0,33 litres 150 times more resources are needed to produce it, than what actually ends up in the product itself.³



Energy is not distributed in a fair way! This table shows the average energy consumption in kilograms of oil-equivalent per person in 2003 in different regions.⁴

Links for further reading:

en.wikipedia.org/wiki/World_energy_resources_and_consumption

earthtrends.wri.org/searchable_db/index.php?action=select_variable&theme=6

1&4) Source: <http://www.wendezeit.ch/energieverbrauch-pro-gebiet-land-kopf-prognose>

2) The production of a computer needs 30.000 Megajoule Energy consumption, pollutes 33.000 litres of water and produces 60 kg waste (source: http://www.at-mix.de/umweltschutz_und_pc.htm).

3) <http://homepages.compuserve.de/pmpoos/kopy.htm>

Record prices for oil and insecure supply

The price of oil has gone up from around \$15 per barrel at the end of the 1990s, to under \$25 per barrel in September 2003,¹ to approximately \$135 per barrel in July 2008. This has not only resulted in higher petrol prices for ever-complaining car drivers, heating and electricity, which everyone uses, has become more expensive, as have all other energy intensive products and services. The high oil price is increasing the pressure on all alternative sources of energy.

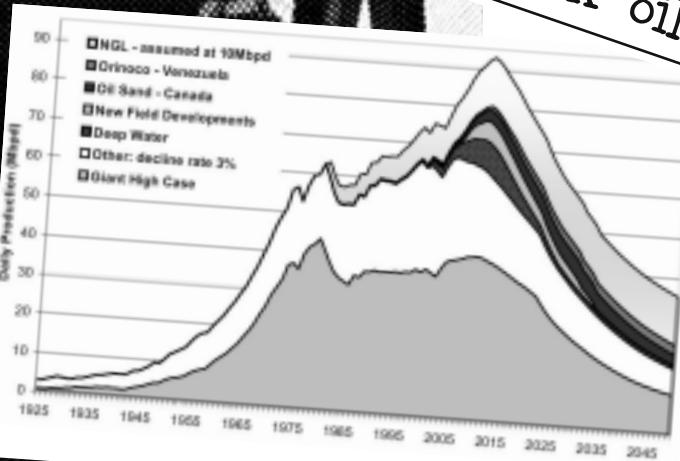
The point is not that the oil will run out soon, but that it is becoming harder to get. Meanwhile the demand is still going up rapidly. It is clear that at some point supply will not be able to meet these demands. We are not certain when this production peak will be reached. It could be this year, in 5 years, in 10 or a few more. But it will eventually happen. And because the economies in almost all countries are deeply addicted to energy and oil, this 'peak oil' will cause massive changes in our societies.

What is going on?

Peak hour

Besides oil, there are more restrictions on natural resources. There is a whole mountain range of peaks to come, so to speak. In many areas fresh water is becoming scarce ('peak-water'). The same is true for the use of land and soil ('peak-soil'), and for minerals. Phosphate (an important ingredient of artificial fertilisers), metal, uranium, water, gold, copper, all these products reached their all-time highest values last year. What this means is that solutions for the energy crisis often conflict with needs for other types of resources that are also becoming scarce.

Furthermore, the world population is still growing and societies are still trying to increase their consumption per person and become more 'wealthy' (in the material meaning of the word). In our capitalist economic system every company and economy needs to grow in order to survive. Making profits is obligatory. But unlimited growth is not possible on a limited planet. We are heading towards a dead-end.



What is the land used for?

To start with a frequently used one-liner: we have only one earth. This is the clear and hard precondition that we use as our starting point for an analysis about global energy use, and some possible solutions, including necessary social change. These changes will not be easy to achieve, but the amount of land worldwide will not grow. We've have to live with this!

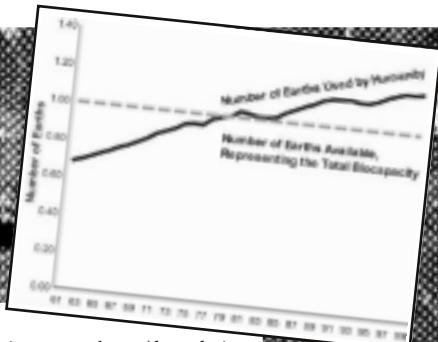
About 70% of the surface of the Earth is water. There are possibilities for fisheries and developing the use of algae, but in our general analysis of the ways in which agriculture is used to produce food and energy crops, the watery part of Earth will be left out.

Agroecosystems cover approximately 28 % of Earth's land area (excluding Greenland and Antarctica), a total of 4.92 billion hectares.¹ The Center for Sustainability and the Global Environment (SAGE) estimates that today 1.5 to 1.8 billion hectares of crop land exists worldwide. This is an area the size of South America. Even more land (roughly 3.2 to 3.6 billion hectares) is used for pasture and range land.²

The main crops produced worldwide are sugar cane (1011 billion kg), wheat (694), maize (628), rice (618), potatoes (321), and soybeans (314).³ The area under soy and oil palm has been increasing fast over the past years. Goldman and Sachs are expecting agricultural land used to grow energy plants for agrofuels to increase from 50 million ha in 2007 to 120 million ha in 2015.⁴

In terms of the average consumption of land required to maintain a particular lifestyle, again there is an inequality between different parts of the world. Europeans need about 4.9 hectares per person.⁵ In 2001, humanity as a whole required 2.2 hectares of productive land per person. But the earth has just 1.8 hectares available per person. If everybody behaved like Europeans, we would need 2 1/2 worlds to cater for our needs. In other words, right now Europeans are relying on the rest of the world to make up this ecological debt.⁶

The graph⁷ shows the ratio between the world's demand and the world's biocapacity each year, and how this ratio is changing over time. The horizontal line depicts our one Earth.



1) www.pbs.org/earthedge/ecosystems/agricultural1.html

2) sources: www.sage.wisc.edu/pages/landuse.html, www.globalrestorationnetwork.org/degradation

3) figures of 2005 from <http://www.isonline.nl/sbeos/doc/file.php?nid=63760>

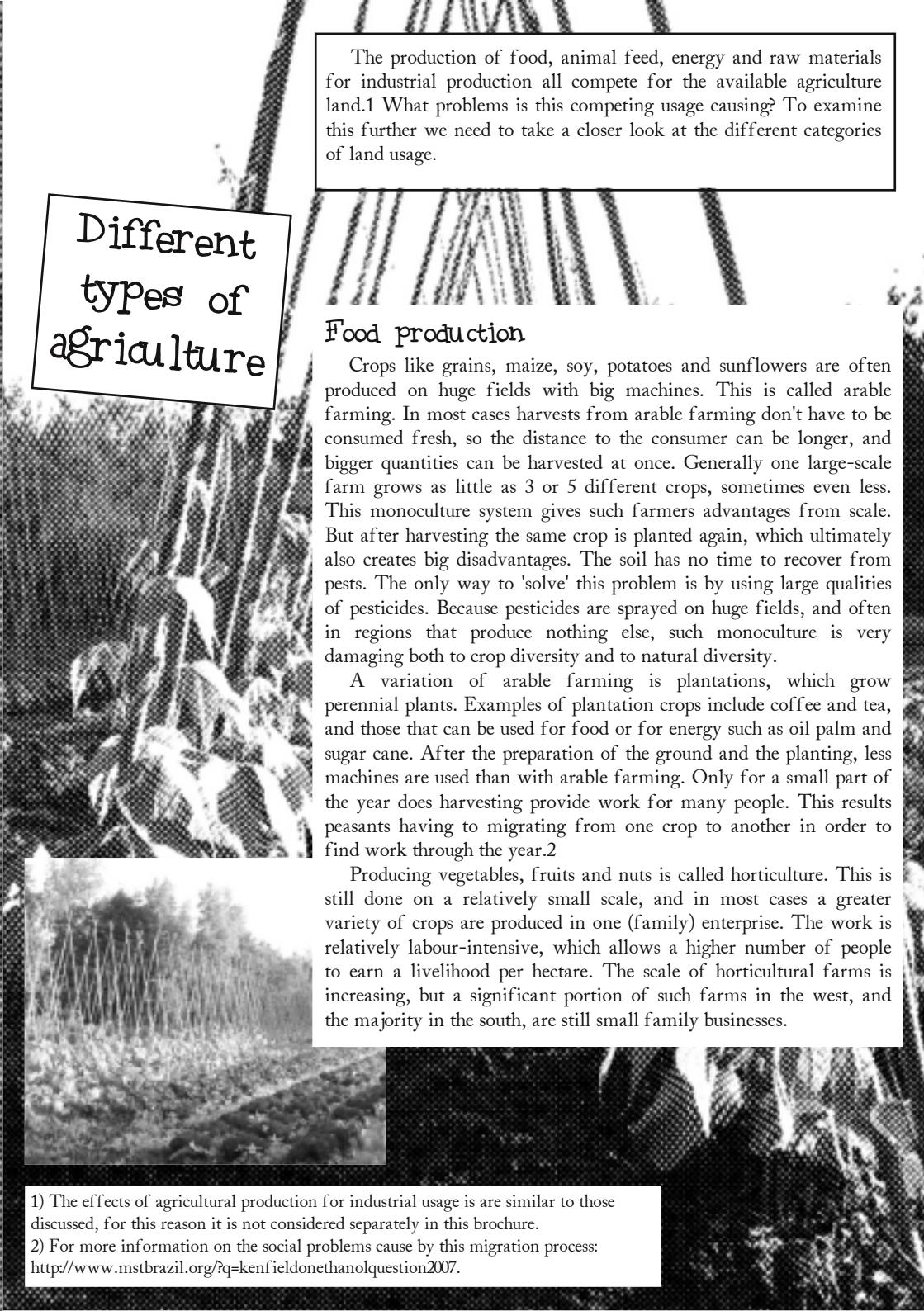
4) <http://zapruder.nl/portal/rubriek/Peakoil>

5) Ireland: 4 ha, USA: 10 ha, people from Central Asia as well as South and Southeast Asia use less than 1 hectare land.

6) http://www.footprintnetwork.org/gfn_sub.php?content=europe2005

7) http://www.footprintnetwork.org/gfn_sub.php?content=global_footprint

background: 'pizzafarms' with circular irrigation systems in Colorado (USA)



The production of food, animal feed, energy and raw materials for industrial production all compete for the available agriculture land.¹ What problems is this competing usage causing? To examine this further we need to take a closer look at the different categories of land usage.

Different types of agriculture

Food production

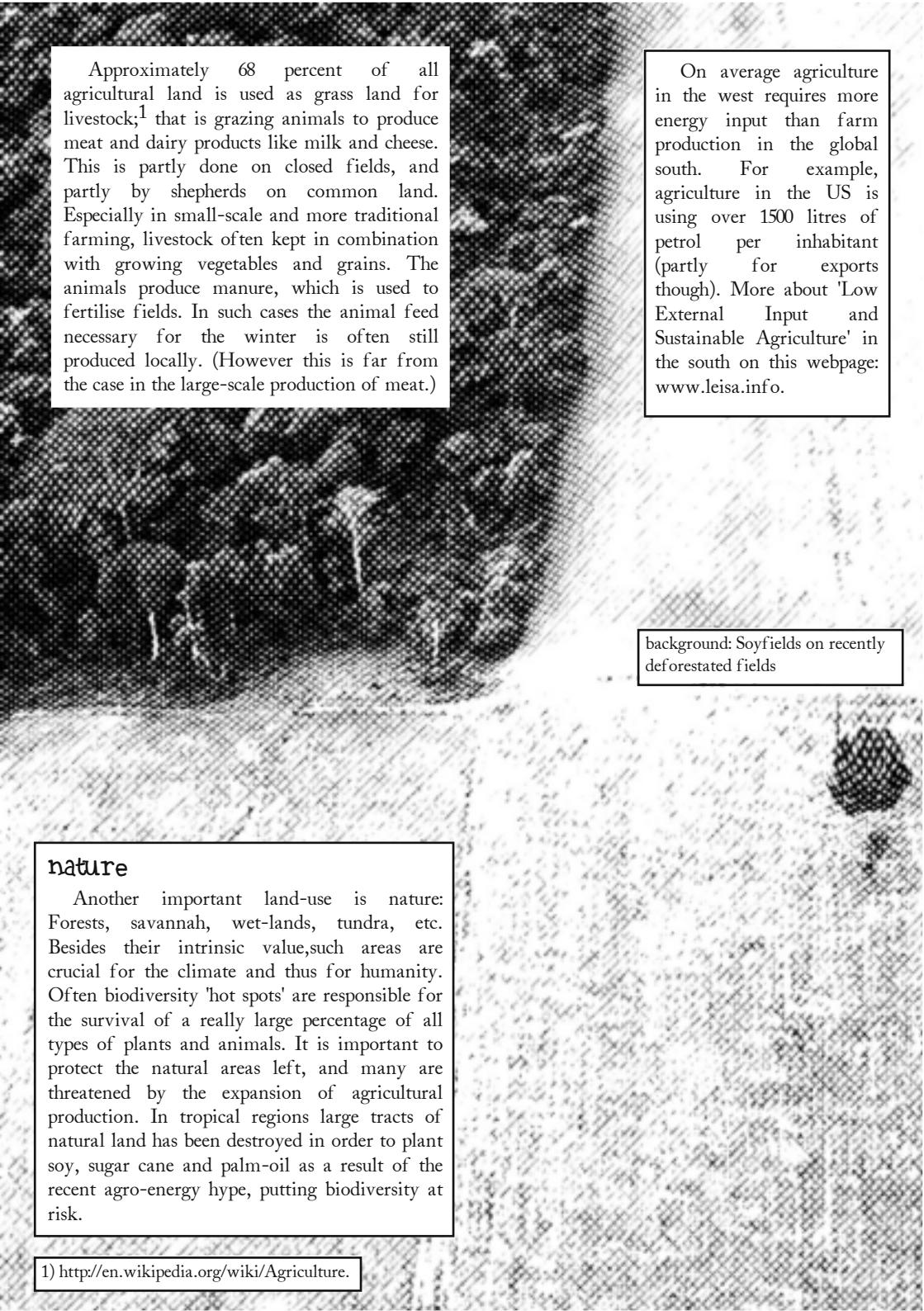
Crops like grains, maize, soy, potatoes and sunflowers are often produced on huge fields with big machines. This is called arable farming. In most cases harvests from arable farming don't have to be consumed fresh, so the distance to the consumer can be longer, and bigger quantities can be harvested at once. Generally one large-scale farm grows as little as 3 or 5 different crops, sometimes even less. This monoculture system gives such farmers advantages from scale. But after harvesting the same crop is planted again, which ultimately also creates big disadvantages. The soil has no time to recover from pests. The only way to 'solve' this problem is by using large qualities of pesticides. Because pesticides are sprayed on huge fields, and often in regions that produce nothing else, such monoculture is very damaging both to crop diversity and to natural diversity.

A variation of arable farming is plantations, which grow perennial plants. Examples of plantation crops include coffee and tea, and those that can be used for food or for energy such as oil palm and sugar cane. After the preparation of the ground and the planting, less machines are used than with arable farming. Only for a small part of the year does harvesting provide work for many people. This results peasants having to migrating from one crop to another in order to find work through the year.²

Producing vegetables, fruits and nuts is called horticulture. This is still done on a relatively small scale, and in most cases a greater variety of crops are produced in one (family) enterprise. The work is relatively labour-intensive, which allows a higher number of people to earn a livelihood per hectare. The scale of horticultural farms is increasing, but a significant portion of such farms in the west, and the majority in the south, are still small family businesses.

1) The effects of agricultural production for industrial usage is are similar to those discussed, for this reason it is not considered separately in this brochure.

2) For more information on the social problems cause by this migration process:
<http://www.mstbrazil.org/?q=kenfieldonethanolquestion2007>.



Approximately 68 percent of all agricultural land is used as grass land for livestock;¹ that is grazing animals to produce meat and dairy products like milk and cheese. This is partly done on closed fields, and partly by shepherds on common land. Especially in small-scale and more traditional farming, livestock often kept in combination with growing vegetables and grains. The animals produce manure, which is used to fertilise fields. In such cases the animal feed necessary for the winter is often still produced locally. (However this is far from the case in the large-scale production of meat.)

On average agriculture in the west requires more energy input than farm production in the global south. For example, agriculture in the US is using over 1500 litres of petrol per inhabitant (partly for exports though). More about 'Low External Input and Sustainable Agriculture' in the south on this webpage: www.leisa.info.

background: Soyfields on recently deforested fields

nature

Another important land-use is nature: Forests, savannah, wet-lands, tundra, etc. Besides their intrinsic value, such areas are crucial for the climate and thus for humanity. Often biodiversity 'hot spots' are responsible for the survival of a really large percentage of all types of plants and animals. It is important to protect the natural areas left, and many are threatened by the expansion of agricultural production. In tropical regions large tracts of natural land has been destroyed in order to plant soy, sugar cane and palm-oil as a result of the recent agro-energy hype, putting biodiversity at risk.

1) <http://en.wikipedia.org/wiki/Agriculture>.

Worldwide a growing portion of arable land is being used for the production of animal feed. While many people might think about hay produced in farm meadows, this is only one part of the reality. A great deal of the world's maize, other grains and soy is grown for feed. Grains provide carbohydrates and soy offers a high level of protein.

The production of animal feed

Animal feed is produced as a commodity for the international market, and the scale of this production is increasing fast. At this moment 33 percent of global arable land is used to produce feed for livestock.¹ In total livestock now uses about 30 percent of the earth's entire land surface.

More and more the meat production industry is completely separated from the land. The animals never see the natural light outside their feedlot sheds. Most (and in some cases all) the feed is produced elsewhere. This results in an unbalanced stream of nutrients; In Latin America, for example, the soil gets exhausted, whilst Europe has problems with the manure polluting the soil and water. This production system also causes enormous social and environmental problems, as described in the paragraph about monoculture.²

The production of meat is less efficient than directly producing vegetarian food. You need much more land, water, fertiliser, etc. to feed the same amount of people! An egg has a 2:1 'food conversion ratio', and 3 litres of milk are produced per kilogram of cow feed. From 3 kilogrammes of feed for a kilogramme of chicken to 16 kg for a kg of beef (cow). The average is about 7:1 which means that at least 7 vegans can be fed on the same amount as 1 meat eater.³

For some years A SEED has been running a campaign on the effects of soy and meat production. For more info see www.aseed.net/soy

1) Source: FOA report Livestock's long shadow

2) Further reading: www.lasojamata.org

3) These figures take into account the fact that about a third of the weight of an animal is the carcass, which is not suitable for human consumption. Besides looking at kg's it is also possible to look at protein production and consumption. The outcomes are similar.

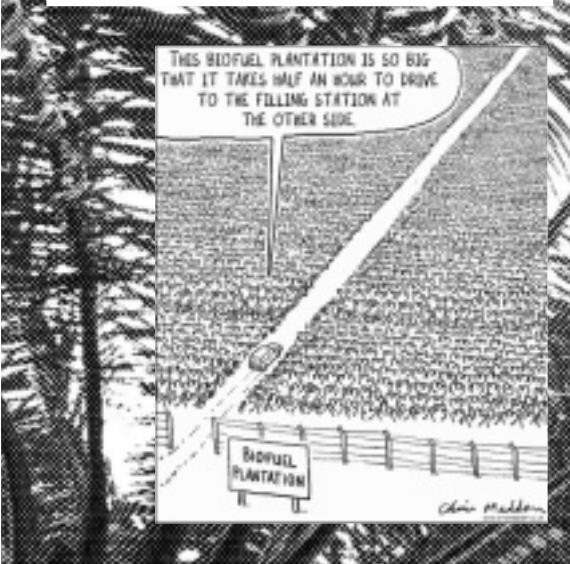


Bio-energy is the oldest form of energy production, and is still a large percentage of the heating and cooking world wide. Burning wood accounts for 7 percent of global energy use.¹ This emits a lot of CO₂, however with relatively simple changes it could be done more efficiently, which would also ease many people's lives. In addition, wood is becoming more scarce. Today only 1/3 of the earth's landmass is covered with forest (not all of which is natural). This is about half the area of natural forest that existed 10.000 years ago.² Another source of bio-energy is from the use of old landfills, manure, household garbage or other types of waste. It is not always clear what is waste and what leftover. When waste becomes valuable the production will become more profitable and go up.

However, this brochure is focussing on agro-energy: energy from crops especially grown for this purpose. This is presented as an alternative to fossil fuels and as a solution to climate change by industry and many governments. We not only question, but actively argue against this hypothesis, for a number of reasons. The large scale production of energy crops uses a lot of fossil fuels. Machine intensive monoculture and the use of (oil based) fertilisers and pesticides exhausts the soil and increases erosion. Water becomes scarce and polluted. Local populations lose land and livelihoods, while the profits end up in the hands of local landowner elites and foreign companies and investors. More about these problems in the sections below about 'agofuel myths'.

Further reading: www.biofuelwatch.org.uk

The production of agro-energy is still much smaller than animal feed, but it is expanding fast. This expansion can be seen in the increasing area used for energy crops, e.g. in Germany. Production of oil/biodiesel from rape covers more than 1.2 million-hectares, and has doubled in the past 15 years. Germany uses 12% of its cultivated land for biofuel crops and can't blend more than 2% of transport fuels without imports.³



The worldwide developments of agofuels are enormous: The Indian government is committed to planting 14 million hectares of land with Jatropha (an exotic bush from which biodiesel can be manufactured); the Inter-American Development Bank says that Brazil has 120 million hectares available for biofuels; and lobbyists in Europe are speaking of almost 400 million hectares being available in 15 African countries. We are talking about expropriation on an unprecedented scale.⁴

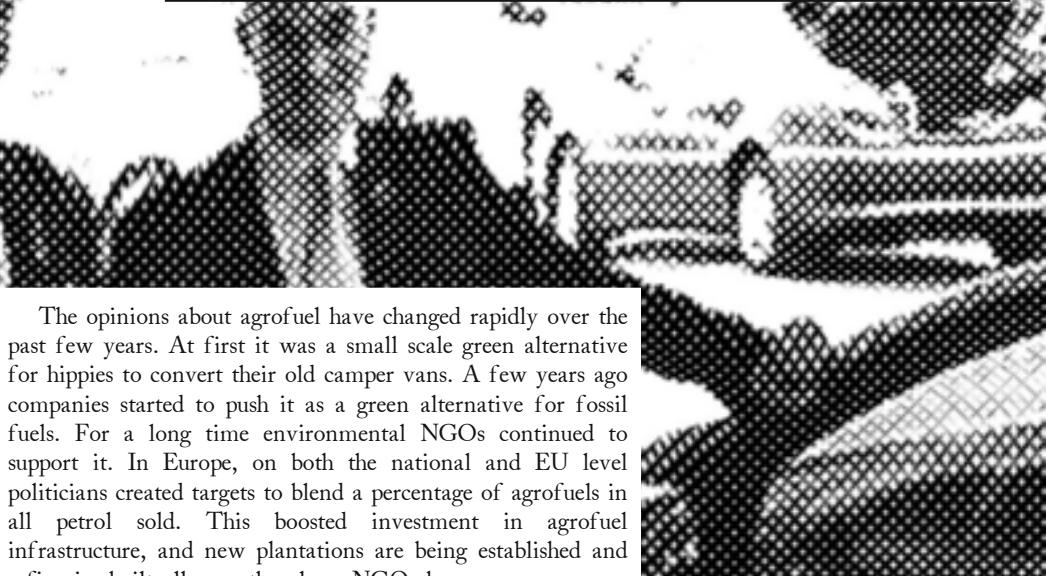
1) Source: <http://cat.inist.fr/?aModele=afficheN&cpsidt=17400422>

2) According to the FAO every year 14 to 16 Million hectares of wood are gone (an area half as big as Germany), link: State of the World's Forest 2007: <http://www.fao.org/docrep/009/a0773e/a0773e00.htm>

3) sources: http://en.wikipedia.org/wiki/Energy_crop and http://www.biofuelwatch.org.uk/the_global_blueprintforabiomasseconomy%5B1%5D.doc

4) source: <http://www.grain.org/nfg/?id=502>

Agrofuels.... good, better, worst



The opinions about agrofuel have changed rapidly over the past few years. At first it was a small scale green alternative for hippies to convert their old camper vans. A few years ago companies started to push it as a green alternative for fossil fuels. For a long time environmental NGOs continued to support it. In Europe, on both the national and EU level politicians created targets to blend a percentage of agrofuels in all petrol sold. This boosted investment in agrofuel infrastructure, and new plantations are being established and refineries built all over the place. NGOs have now changed their opinions about agrofuels, but too late. Only recently have the negative consequences of the large-scale production of energy crops become known to the broader public. The EU created mandatory targets for blending all petrol with 5,75 percent agrofuels in 2010. On top of that many power plants that will have to run on biomass like oil palm are being built or planned.

Now, in 2008, even politicians are starting to admit that the policy they created only 2 years ago was a mistake. Even the UN's Food and Agriculture Organisation (FAO) and the World Bank agree that there are many negative effects, and that the enormous increase in food prices globally is largely due to the agrofuel boom. Meanwhile, contracts are being signed anyway, and the production of agrofuels is increasing fast. If we don't take action this trend will continue in the coming years!



Biofuel greenwash pictures. With on the left Richard 'Space Tourism' Branson from Virgin Atlantic Airways, presenting an ethanol car.

Fuel consumption

One of the main powers promoting agofuels is the car industry, because it makes it possible to continue selling cars as if nothing has changed. An average (new) car needs about 12 litres to drive 200 kilometres. To produce 12 litres with current agofuel technology you need about 80 square metres (0,008 hectare).¹ This doesn't seem to be so much. It means that someone travelling 25,000 kilometres a year (a bit over 100 kilometres per working day) by car between home and work, needs about 1 hectare of arable ground for transport alone. And this is only the fuel; it doesn't count the production of the car and other infrastructure. Imagine that this person also wants to eat, heat his or her house, or even go on holiday... This person's claim on the world's scarce land becomes greater.



Ecological Footprint

The Ecological Footprint is a method for measuring human impact on the environment. Today, humanity's ecological footprint is over 23% larger than what the planet can regenerate. If everyone in the world adopted the European lifestyle, more than two and a half planets would be necessary to provide the necessary resources, absorb the waste, and leave some habitat for wild species.

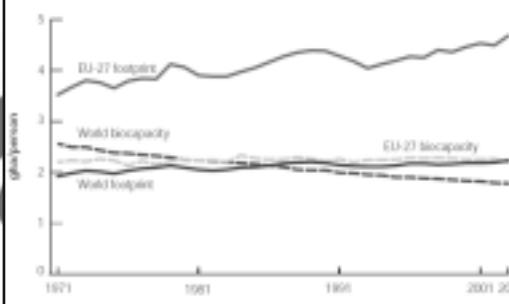
However, going back to a sustainable footprint level doesn't mean that we have to go back to the Middle Ages! When Europe's footprint was first measured, in the 1960s, it was of about the same size as available bio-capacity. Since then it has more than doubled – increasing by 16 per cent in the last 10 years. Using technological improvements, it would be possible to live sustainably within the limit of 1.8 hectares per person. In the section about alternatives you can read how.



Further reading about the ecological footprint:

assets.panda.org/downloads/europe_2007_gdp_and_ef.pdf
www.footprintnetwork.org
www.wupperinst.org/en/home
creativechange.net/resources/area/resource_footprint.htm

EU countries and world average Ecological Footprint, 1971-2003
(global hectares per person)

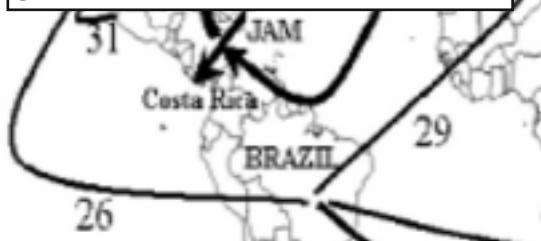


¹ www.aseed.net/index.php?option=com_content&task=view&id=208&Itemid=107 (1 hectare produces about 1500 litres oil)

Interrelations of "West-South-North-East"

- The World -

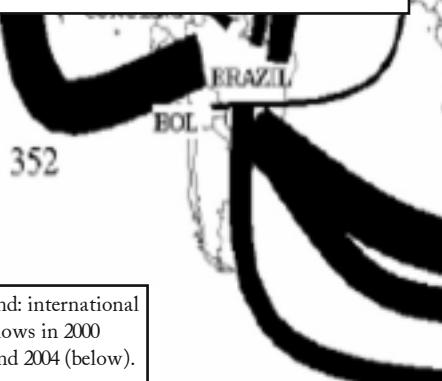
The previous pages shows how mainstream behaviour and consumption in 'The West' needs a lot of land and energy. It is not possible to produce all of this within western countries.



"The South"

The perception of land surplus in the "West and North" ignores the massive imports of food and animal feed that make western lifestyle possible. Countries from the Global South countries are making money with such exports, but often there is a continuation of the power relations of the colonial era because western countries largely dictate the prices. Very often the land is owned by (often western) companies or individuals making profit, and having little positive impact on the rest of the community. In the 'Global South' usually only a small elite profits from such exports.

The huge push to export food, animal feed and energy crops to 'the West' is resulting in unsustainable agricultural practices in 'the South', including deforestation and soil depletion.



background: international ethanol flows in 2000
(above) and 2004 (below).

"The West and North"

Interestingly, in countries like Germany and the Netherlands it seems as if there is too much agricultural land. Agriculture is not cost-efficient any more and increasingly farmers have to close down their farms. In the Netherlands almost 3000 farmers quit their jobs annually (about 4 to 5% of the total), in the UK this is about 30,000, and in Germany agricultural farms in the 2 hectare size range decreased from about 540.000 in 1991 to about 360.000 in 2005.¹ Such land is turned over to nature, into extensive living areas, and into recreation parks and golf courses. Over the past few years the production of crops for agro-energy has been presented as a 'solution' for the European (and US) countryside: farmers get a new future and 'clean', 'climate neutral' energy is produced - it is presented as a win-win situation.

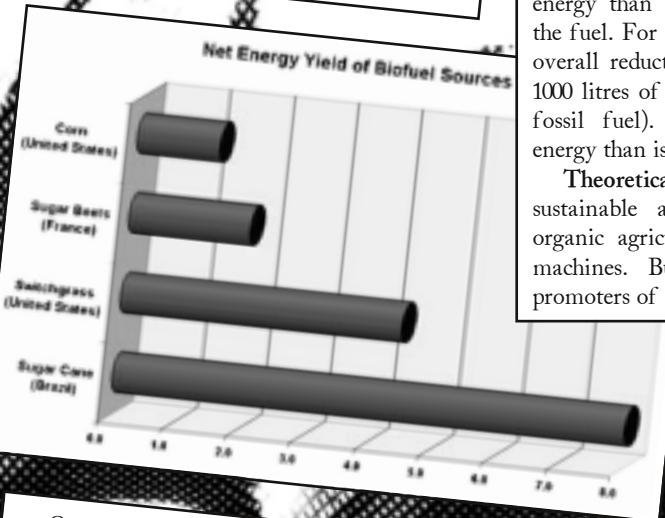


"The East"

Many Asian countries ('The East') export natural resources and agricultural products to 'The West', but recently the use of cars and meat consumption are booming, following Western consumption patterns.

While those in the West and North cannot question the East's right to experience higher living standards after years of inequality, it is important to critique the way the unsustainable western high-consuming lifestyle is presented, even imposed, as the way to go. The general goal of politicians and companies is still economic growth and increased consumption. And in the East this is not just a goal, it is becoming reality!

myth 1: "The use of agofuels is climate neutral"



Over the past two centuries the same process of deforestation and expansion of agricultural land took place in Western countries. The creation of 'polders' (agricultural land created by draining wetlands) over the past 10 centuries has converted peat into greenhouse gasses. (The Dutch people rarely consider this as an ecological debt.)



It seems to be simple: A plant gets CO₂ out of the air. After burning the crop this will go back, creating at least a balance. Easy isn't it?

But reality is more complex. The production of energy crops and the processing of the fuel need fertilisers, pesticides and machines that run on fuel. Depending on the crop, agofuels provide approximately the same or slightly more energy than was used during the production of the fuel. For example, canola (rapeseed) offers an overall reduction of about 30 percent (producing 1000 litres of agofuel requires about 700 litres of fossil fuel). Grains provide almost no more energy than is used during the production process.

Theoretically it is possible to produce sustainable agro-energy through small scale organic agriculture that does not use many big machines. But this is not what the current promoters of agro-energy are talking about.

Another important factor is the expansion of agricultural land: agricultural fields are created in areas where there was previously forest. In the process lots of greenhouse gasses are released in the deforestation process, particularly if the original vegetation is burnt. Sugar cane, the crop that scores best on efficiency, is often produced in areas with a lot of deforestation. CO₂ and other greenhouse gasses like methane get released when land is cleared. This emission of gasses during the conversion of natural vegetation into plantations is most outrageous when it is done to swampy peat land. After a lowering of the ground water level peat starts to rot, resulting in methane emissions. This process made Indonesia, with its fast expansion of oil palm plantations, the third largest emitter of greenhouse gasses world wide.

Taking all these factors into account, it is fair to conclude that the large-scale introduction of agofuels does not reduce emission of greenhouse gasses.

myth 2: "Agrofuels don't have to compete with food"

JUSTICE

When you grow maize which can be used both as food or as ingredient for bio-ethanol it is clear that the priority is fuel for the rich and that the poor will become hungry. For this reason, companies and politicians often focus on the use of other crops like Jatropha, grasses or wood. People can't eat these, so there is no problem ... But the same land and water is used to produce these crops, and in fact they often use even more water. It doesn't matter that the end product on the field is not for human consumption!

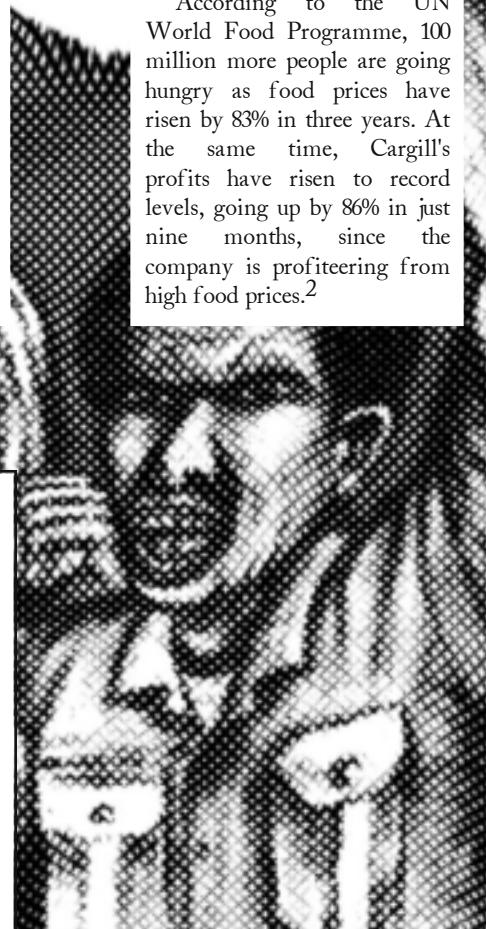
On a much lower level, energy crops can produce a sustainable source of energy. For example, the poisonous Jatropha can grow in fields between food crops. But this small-scale farming will not provide fuel for a significant percentage of the current and forecasted demand. The large-scale production of agrofuels will push the production of food further into what is left of the forests, or it will reduce production of food, both for local consumption and for the world market.

Demand for biofuels in Europe and the United States has forced up food prices 75 percent around the world, according to a World Bank report leaked in July 2008.¹

According to the UN World Food Programme, 100 million more people are going hungry as food prices have risen by 83% in three years. At the same time, Cargill's profits have risen to record levels, going up by 86% in just nine months, since the company is profiteering from high food prices.²



Blockade of the Cargill plant in Gent (Belgium) on April 17, the international day of farmers struggles.



1&2) You will find the sources when you visit the article 'The appetite for biofuel starves the poor' in the Guardian. <http://www.guardian.co.uk/commentisfree/2008/jul/03/biofuels.usa>
background: detail of a banner at the protest during the WTO-summit in Hong Kong, 2005.



"Wait for the next generation"

Agrofuel promoters often admit that critics of the first generation agrofuels (mainly from oil crops) are correct, but that the second generation of such crops will solve the problems raised. Second generation refers to a procedure used to get agrodiesel from materials containing cellulose, for example, grass or wood. However the claim that this will solve the problems is also a myth. The second generation procedure is more complicated, more expensive, and has not yet been applied on a larger scale. To add to this, the production of cellulose is done on large scale plantations (see Myth 2 and 3).

myth 3: "Marginal land can be used for agrofuel"



This relates to the previous point. The theory is that some land is too poor or too dry to be used for food production. One example is Jatropha. Besides the fact that this crop is poisonous, it can grow under very dry conditions on exhausted soil. However the issue is not that simple. Marginal lands produce marginal outputs, and would require adding nutrients to give larger outputs. Artificial fertilisers are based on fossil fuels, and their use emits CO₂ and nitrogen.¹ In addition, poor soil is much more vulnerable than rich agricultural land. Such land will easily be degraded by bad management and too many harvests.

Besides natural limitations, the economic reality will cause problems. Agrofuels are big business and countries as well as companies have to compete with each other. For this reason producers will not go for marginal lands but for the fields that produce the highest yields per hectare.

1) More about biological possibilities and limitations of Jatropha and other energy crops in 'Food, fuel or forest?: opportunities, threats and knowledge gaps of feedstock production for bio-energy: proceedings of the seminar held at Wageningen, the Netherlands.', (<http://library.wur.nl/way/bestanden/clc/1842474.pdf>) and other reports from P.S. Bindraban.

2) www.lei.dlo.nl/nl/content/agri-monitor/pdf/Kunstnest%20invloed%20van%20prijsstijging%20op%20inkomen2.pdf

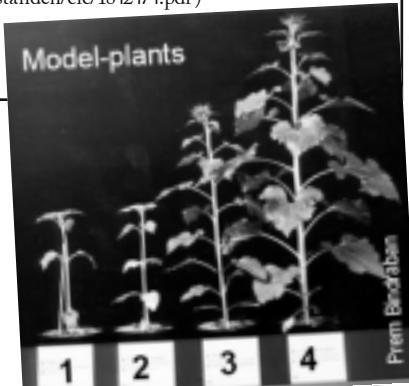


5 mm



10mm

The effects of water and nutrients on growing plants. Experiment P.S. Bindraban.
1: little water and nutrients
2: enough water, little nutrients
3: little water, enough nutrients
4: enough water and nutrients



myth 4: "Certification of agrofuel will prevent problems"



Over the past few decades many certification processes have been started up. You will recognise, for example, Fair Trade coffee or banana's. The organic label is another form of certification. Recently a process has started to a part of the agrofuels certified. However, there are some fundamental differences between certifying coffee and fuel.

Most of the problems relating to agrofuel production are caused by the size of production: more arable land is needed; it is done through monoculture; it is reducing food production. The current processes for certification of agrofuels will not solve these problems. Certainly aspects of production could improve. Some oil companies may be able to sell petrol that has not been produced on recently deforested fields. Maybe it is even possible to produce fuel with less use of pesticides, without Genetically Modified Organisms (GMOs), produced by farm workers who get a good salary, or from crops that can't be used for human consumption. But the rest of the production just moves elsewhere, and conflicts with what is left of natural wilderness, or with small farmers and peasants who are not able to resist. The total volume of the production and trade are no criteria.

Toyota, the huge soy and grain trader Bunge and oil companies like BP and Shell..., a look at the steering board of the Roundtable on Sustainable Biofuels makes clear that this process will not result in serious criteria that lower production and export of agrofuel crops.¹ The same can be said about the roundtables for oil palm (RSPO) and soy (RTRS);² these have been in existence for longer, but are unable to reduce the unsustainable stream of those products from the South to the North.

As long as companies are competing on the world market they will try to keep salaries as low as possible, spend as little as possible on environmental measures. A soy trader wants to trade as much soy as possible; a fuel company wants to make as much profit as possible selling fuel. The food industry and animal feed sector are joining the Round tables in order to improve their images and secure the products they need for their business. In the current system, certifying the production of agrofuels will not stop its negative effects.

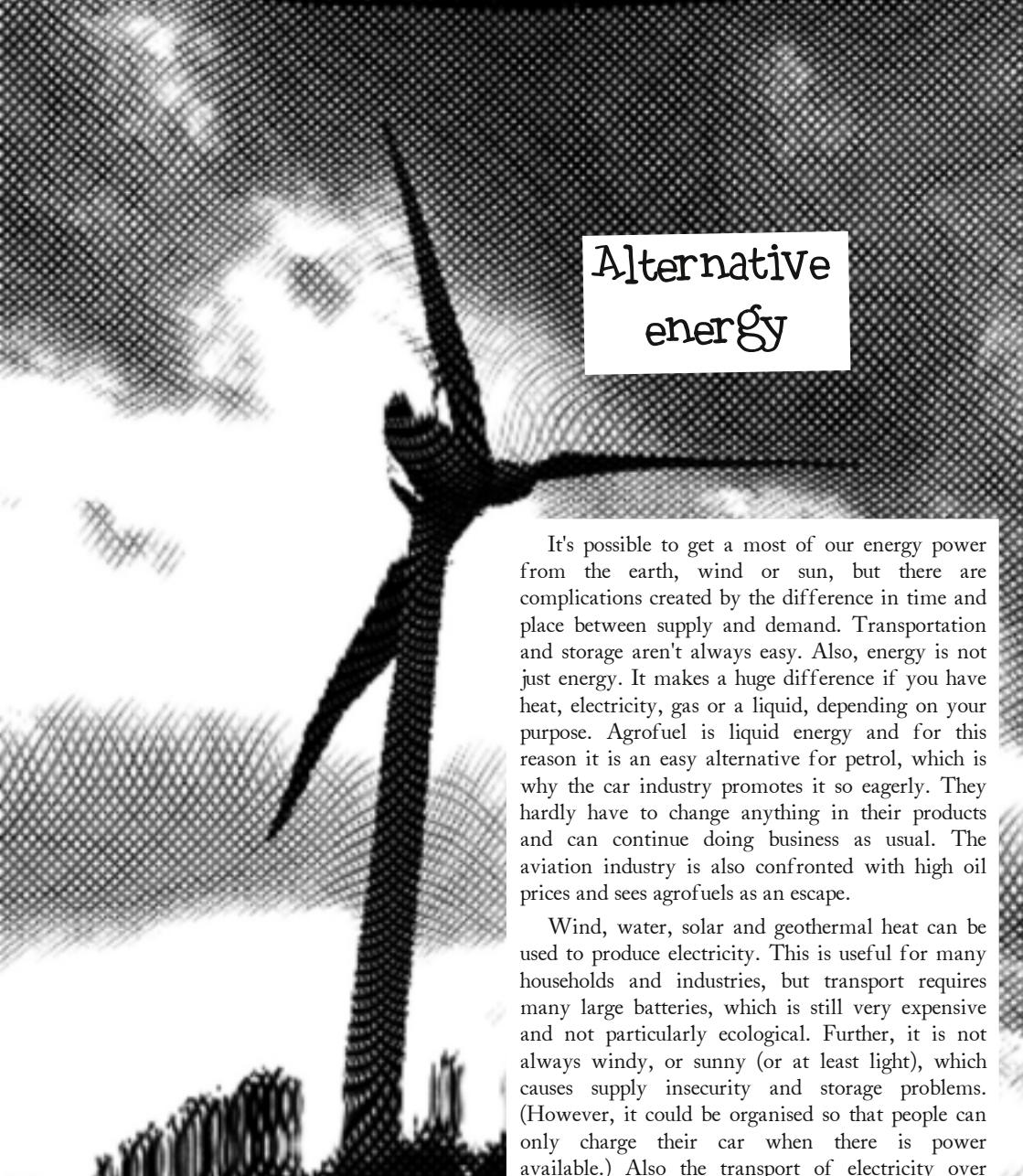
1) Roundtable on Sustainable Biofuels: <http://cgse.epfl.ch/page67476.html>

2) Round table of Sustainable Palm Oil: www.rspo.org and Round table on Responsible Soy: www.responsiblesoy.org

Further reading: www.theneutralgroup.co.uk/16.html, www.lasojamata.org/taxonomy/term/60,

www.lasojamata.org/files/RTRS08paper.pdf

background: monoculture eucalyptus plantation. picture from (pro-agrofuel) site <http://ecotality.com>



Alternative energy

It's possible to get a most of our energy power from the earth, wind or sun, but there are complications created by the difference in time and place between supply and demand. Transportation and storage aren't always easy. Also, energy is not just energy. It makes a huge difference if you have heat, electricity, gas or a liquid, depending on your purpose. Agrofuel is liquid energy and for this reason it is an easy alternative for petrol, which is why the car industry promotes it so eagerly. They hardly have to change anything in their products and can continue doing business as usual. The aviation industry is also confronted with high oil prices and sees agrofuels as an escape.

Wind, water, solar and geothermal heat can be used to produce electricity. This is useful for many households and industries, but transport requires many large batteries, which is still very expensive and not particularly ecological. Further, it is not always windy, or sunny (or at least light), which causes supply insecurity and storage problems. (However, it could be organised so that people can only charge their car when there is power available.) Also the transport of electricity over long distances (for example from the Sahara to Europe, from a sunny place to a place where it is already dark and time for television) results in substantial energy losses.

How can we produce power if large scale agrofuels are out of the question? Water energy, wind energy, solar energy, and geothermal heat are all viable alternatives sources. This brochure is too short to explain them all but you probably have a rough idea how they work.¹ Here we only outline the issues relevant for the agrofuel debate.

Read more about renewables on:
http://en.wikipedia.org/wiki/Renewable_energy and follow the many links on that page.

Big dams on rivers to produce electricity has a massive impact on the environment and on the people living in the area. Small-scale hydro power is possible, but will not keep our transport going. Using tidal or wave energy on the open sea is less controversial.

Hydrogen could become used as an alternative fuel. The result would be a clean, zero-emission car. But hydrogen is only storing energy. First you have to produce it - from dirty coal or a renewable source. But with every conversion, energy is lost. Furthermore, hydrogen is very explosive. There are ways to deal with this in a safe way but the infrastructure needed is expensive.

Other problems are caused by the priorities of companies. Oil companies and car producers are putting a lot of money and effort into research, however they are steering the developments in a particular direction: small alternatives, competing research and patents are bought and silenced. Large companies will only introduce a new product when they can make money from it. For decades car companies have been promising new, green models that need only 4 litres of petrol for 100 kilometres. But in reality cars have only become bigger, faster, more heavy and air-conditioned: The climate can wait; first these companies have to make more profit.

Governments are also to blame; If all the state funding that goes into nuclear power and research on GMOs were used for organic farming and really clean renewables, much more progress would be being made. But in who's interest is this ... ?

It is safe to conclude that using real, sustainable renewable energy for transport is a bit more complicated than heating a house or providing green electricity. People in western countries will have to reduce their travelling and their dependency on goods transported over long distances. More about that in the chapter about alternatives in the back of this brochure.



Fake clean energy 1: coal

For future electricity production, many countries and electricity companies are aiming to move from gas towards coal. It is a bit harder to replace petrol and gas for transportation with coal, as most cars need liquid fuel. A conversion is possible: gas previously used for electricity will now be used for transport. Also the development of electric cars makes a switch towards coal possible.



In general, a move towards coal is not a positive development. The mining of black and brown coal is very polluting. And burning coal releases a lot of greenhouse gas into the air. Electricity companies are talking about applying 'clean coal' technologies, such as washing impurities from the coal. But this merely transfers emissions from one waste stream to another. There are plans to capture CO₂ at power plants and store it afterwards (geo-sequestration). However, this process is still relatively untested and needs a lot of energy, which makes the power plants less efficient and increases problems with the mining and transport of the coal. Coal is still one of the most polluting sources of energy, there is nothing green about it. It is already safely stored in the ground. Let's leave it there!!

Fake clean energy 2: nuclear

Nuclear power is not the answer to our energy problems either. Nuclear power plants have to be fuelled with uranium. Mining of uranium creates enormous pollution, uses vast quantities of water and creates social and cultural problems for local populations. In addition, uranium is becoming more scarce and harder to access which increases such problems. Once nuclear power is created, there is the well known problem with nuclear waste. There is still no safe storage facility for highly toxic nuclear waste worldwide, and it takes 10's of 1000's of years to breakdown. This is not something we can leave for future generations to deal with.

Not only are coal and nuclear power polluting, they are also dependent on limited resources that will be depleted within 50 or maybe 100 years. These are not viable energy sources, so we have to look elsewhere for alternatives.

These are not viable energy sources, so we have to look elsewhere for alternatives.

Further reading:

Coal: www.coal-is-dirty.com and www.howtocookaplanet.net

Nuclear: WISE campaign on uranium winning: www.wise-uranium.org, <http://nukingtheclimate.com>

Climate and energy use: 'Heat: how to stop the planet burning', George Monbiot; www.monbiot.com

Conclusions

This brochure has taken a critical look at the large-scale production of agrofuels. Agrofuels are failing to reduce green house gas emissions, and the social and ecological effects are largely negative. Coal and nuclear also have serious disadvantages as substitute for fossil fuel. The conclusion we can't avoid is that people in the West should reduce their level of energy consumption. The issue should be seen from the viewpoint of land-use in general, and in relation to food (especially meat) and other resources: 'The West' has been using and polluting more than their share of the world in the past decades. Estimates of what a sustainable share per person world wide would be, clearly show that the West is over exploiting the world's resources.

Production of agro-energy on a small scale could be a good solution for a local community, as long as it is not based on monoculture and is done in a sustainable way that achieves a balance between food and energy production. Fulfilling the local needs should get priority, not the export. This would make communities independent from expensive and sometimes unreliable energy (and food) imports.

Over the past few years increasing numbers of organisations and individual people have been spreading the message about reducing consumption. In Europe there is a growing 'degrowth' movement and, mostly in English-speaking countries, there is the promising development of 'transition towns' where many people and groups with different backgrounds come together to prepare their town for Peak Oil and climate change, and in general, aim to create a more social and sustainable community.¹

The future will look different. But how?

It's the poor being hit the most by increasing prices of basic foods like grains, maize and rice. This has lead to protests and riots in many regions of the world. In the US and Europe, citizens are more concerned about the increased price of petrol, which has resulted in road blockades by truckers and farmers. But the high price of energy has also had a deep impact on people in the Global South. Food and oil prices will continue to go up. This, in combination with a very unstable economic circumstances, will cause political changes.

The question is: in which direction will changes go? Hopefully, in a way that moves away from oil consumption, mass travel and massive meat consumption; a way that creates more social and sustainable communities. This is what A SEED Europe hopes, and is campaigning, for.

Careful attention needs to be paid to right wing sentiments, as politicians are blaming other countries or groups for the high prices of food and petrol. The countries consuming the most oil and other resources are also the ones with the most political and military power. Will they give up this privilege voluntarily? Probably not. For these reasons it's extremely important to campaign for alternatives, for sustainable societies, and to show that the transition can make life more worthwhile.



1) More about the degrowth movement and transition towns in the next section on alternatives.

Alternatives

People in the West should radically reduce their use of energy and other resources. This message is clear, but also rather general and abstract. The challenge is to translate this into concrete and attractive change and to show what a sustainable life looks like. In many ways it could be more enjoyable and rewarding than our present lifestyles.

It should be a strong and honest message. Consuming more by just installing some energy saving light bulbs or choosing an efficient car or washing machine in the shop will not help. We will have to change the way we live on a fundamental level, which may not always be easy. However, escaping our present stressful consumption patterns can result in a great deal more satisfaction, especially when we realise that our European lifestyle causes a lot of misery in other parts of the world.



Using less energy and other resources doesn't mean going back to the Middle Ages. In the 1960s the ecological footprint of Europe was still in balance with the available bio-capacity, so we can achieve this again. Reaching a sustainable level of CO₂ emissions will be harder, but this can be done if all sectors do their bit. Smart new techniques will be necessary, but the starting point of our activities should be to keep our pollution and our use of resources within sustainable boundaries.

The following section offers a few examples for changes that we could make in the different energy-consuming fields of our lives. In western countries transport counts for 30% of energy use, housing for 30%, food for 20%, and goods and waste disposal for 20%.1

Some info will be familiar to you, but we hope that there may also be inspiring new information.



1. Transport/Travelling

It is helpful to be aware of the energy ratio when you buy a car, share a car (car pooling, hitch hiking), don't drive faster than 100 km/h, use public transport, and choose the comfortable night train instead of an aeroplane. However, although these are all steps in the right direction it will not be enough.

Trains and buses also use a lot of energy. We simply travel too much. When taking into consideration the destructive consequences, the first question should be whether all this travelling is really necessary. Should it be normal to work more than 20 kilometres from the place where you live? How about working more often from home? Do you need to go that far to have a nice holiday? And if you do travel, do it well - take your time: "The way is the goal", as Gandhi said). Adjust the distance to the amount of time you have for travelling. Or travel 2 months every 2 years instead, of three times a year.

Most trips by car are shorter than 10 kilometres. Almost everybody can do this by bike. Cycling or walking might even be a good substitute for going to fitness centres. Isn't it a paradox that as everything gets more mechanized, people need machines in fitness centre to do enough exercise?

Price difference is one of the reasons why travelling to far away regions is attractive. This is due to low salaries and the unequal distribution of wealth and opportunities in the world. Changes towards global sustainability would erase this attractiveness based on money. If we only want to have a short break to rest and swim, this should be done locally. To get in contact with other people and cultures it would be better to travel slowly for some months.



Love miles

The book Heat by George Monbiot introduces the term 'love miles', which means more than just travelling towards your lover. It reveals the difficult tensions that can exist between ecological ethics and social ethics. Say, a relative is getting married in the US. Going there is too polluting and uses up your carbon credits that make up your carbon footprint for many years. But not going would not be appreciated by your family or friends. However, only a small rich minority, mainly in the West, has this 'problem'. Most people will never be able to even consider travelling such long distances.

The more international contacts you have, the more arguments you have to fly. Wealthy, lefty people can tell people not to eat meat, not to drive by car to work or not to buy a huge television. But it is hard for them to tell people not to fly, since they themselves are so internationally-oriented and into travelling. Even environmental campaigners are fly often. These are just some examples that show how hard it will be to change people's energy consumption habits.



"Regionalism without borders.
- Travelling - yes, but less fast."

2. Food and Cooking

In the food sector things have already started to change, however we still get apples from New Zealand, even 'organic' ones! The most important step to take is to buy food locally and seasonally. Eating less meat, or no meat would, as pointed out earlier, be good for animals and the environment. And what about the packaging materials? Are they plastic or paper, is all that aluminium foil really necessary? If you search for a food co-op in your neighbourhood, you may be able to buy organic food in bulk - less packaged material and relatively cheap.

In addition, cooling and cooking of food, and washing the dishes have a considerable environmental impact. Besides the production of the equipment, a lot of energy is required to use them. One of the easiest and most basic things you can do when really needing a new fridge or washing machine is to look for the energy-usage stated with a letter system A++ (the best at this moment). But there are everyday small things one can do, like taking things out of the freezer in good time and letting them defrost naturally.



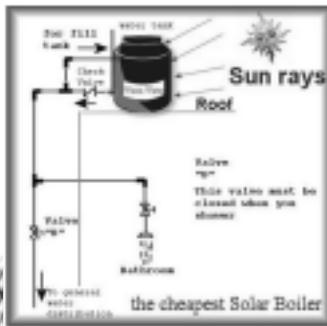
Background: local organic food at the farmers market in Amsterdam

3. Rest Consumption/ Goods

In general, all the products we consume could be much more long lasting. Why do we follow the short-term trends big companies are advertising? Being creative and cool doesn't have to mean following the latest fashion and paying a lot of money for it. Pimp your clothes or swap them with one another. Or buy second hand clothing to create a much more individual look without wasting resources. And when there really is a need to buy new clothing or other products, pay attention to the environmental and social aspects of their production.

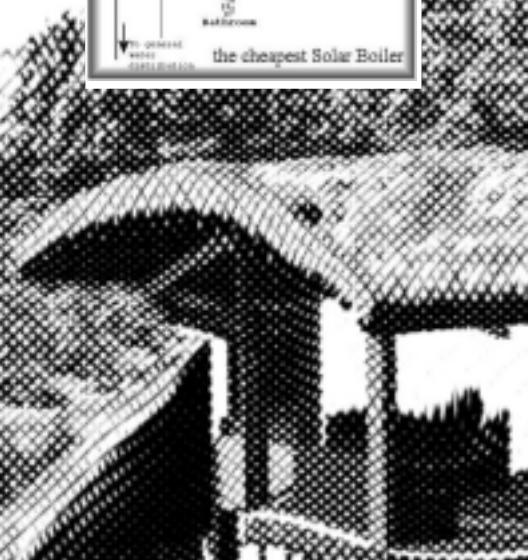
And then there's the care you can take in terms of all kinds of electrical appliance. Unplug electrical devices instead of using the stand-by mode, for example. But there is more to gain by questioning the use of all these machines. Why mechanize everything, even things like an orange press or a tooth brush? Isn't sweeping often as good as using a vacuum cleaner?

4. Housing/ Living



Housing accounts for 45% of the environmental impact caused by households. Emissions are produced in the processes of building or renovating housing, and in providing heating, hot water and light. You can reduce your electricity usage by replacing conventional incandescent light bulbs with energy saving ones which use 5 times less energy and last 12 times longer.

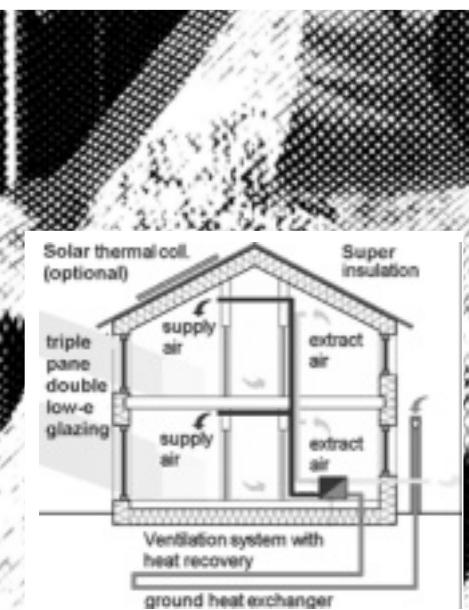
As stressed earlier, installing solar panels and boilers to generate your own electricity and hot water can significantly reduce your energy use. A solar geyser in particular is very cost efficient, and is quite easy to build yourself. (For instructions go to www.instructables.com and search for 'solar boiler') Furthermore, it is possible to build 'passive houses' in which you can live comfortably without any active heating or cooling systems. In Germany thousands of such houses have already been built. (You can read more about this on www.passiv.de.)



Degrowth and transition towns

For decades, groups and individual people have been bringing alternative, sustainable lifestyles into practice. Other people have written about the changes that are needed. It this is not new. What is new is the emergency of sizeable international movements that aim to stop economic growth. In April 2008 for example, an international conference was held in Paris on the topic of "Economic Degrowth for Sustainability and Equity", which resulted in a declaration that you can read on www.degrowth.net. Another promising development is the creation of 'Transition Towns', in which inhabitants are trying to make their town or neighbourhood sustainable, and to be prepared for Peak Oil and climate change. Background information, a toolkit, and links to active transition towns can be found on www.transitiontowns.org.

However, both movements are in their initial phases, and it is not possible to see concrete results yet. Creating a change in attitudes and behaviour on a large scale is not easy. It will take time, but the way some towns are progressing is very promising.



Consuming in a 'green' way by buying environmental friendly products is nice, but consuming less is the most important change we all have to make!

Public Sector

For schools, hospitals, city halls and public transport, for example, the same criticisms and alternatives that we propose for households are valid. Institutions could save more energy as they do at this moment. They could look more critically at the products and food they use, and scale down their transport. Although we have less influence than we have with our individual choices, we can still put pressure on such institutions.

Politicians

Confronted with environmental and social problems, politicians sometimes come with some statements and even new policies against pollution, exploitation and other excesses of overconsumption. But the next day it is business as usual and growth and spending power are priority again. The Lisbon Agenda¹ makes all politics in the EU subordinate to the competitiveness of the economy. Hardly any politician dares to criticise this. "Solidarity, but only as long as we win."

On top of that politicians are not giving a good example by flying around the world and driving huge cars.

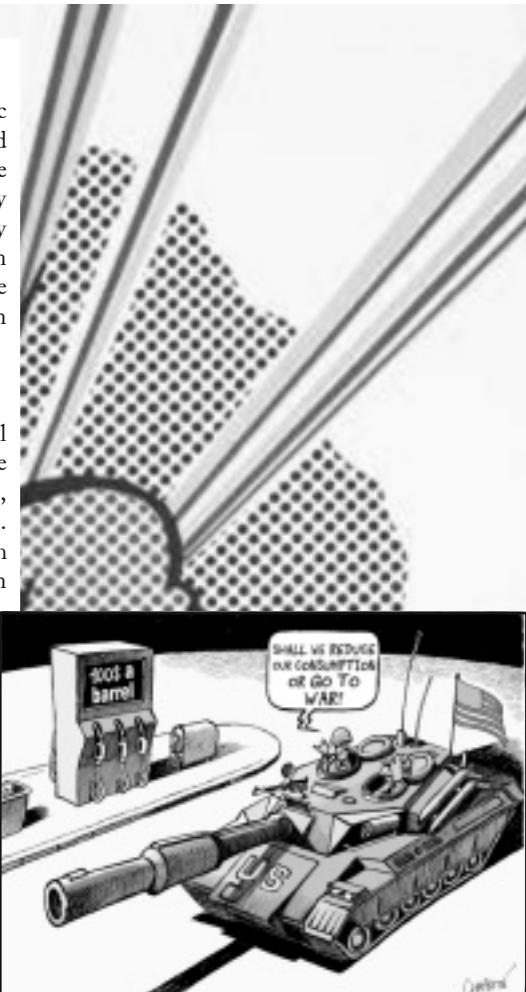
Police

Using a helicopter above a bike demonstration or driving by car through public parks does not show a very green consciousness.

Military

There will never be a sustainable army. A fighter plane does not only kill, but also needs an incredible amount of energy. And have you ever seen soldiers cleaning up after shooting their bullets? Did you know that the US-military's energy usage is higher than the energy used by 2/3s of all the countries in the world?²

Reducing our individual transport usage and meat consumption would do more for the climate and the redistribution of wealth than betting on agrofuels. Some changes can be done very easily - right now, and others need to be worked on. Maybe the 'transition towns' are leading to real change..... coming together and envisioning a more sustainable social system is a good starting point, but **taking action is the way to go!!!**



- 1) www.oekosystemerde.de/html/energiegeschichte.html
- 2) More about the EU's Lisbon Agenda: www.corporateeurope.org/ebs2004.html

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The previous section explores how you can start to live sustainably and build a society that does not conflict with natural resources and the climate. Some first steps should be easy for everyone, but other changes will be much harder to establish. Probably not everybody will take on their responsibility. The same can be said about companies or governments. So how do we approach this problem?

People should have the freedom to decide about their own lives, provided they don't disturb the possibility for others to have the same freedom and a decent life. When people live in a way that clearly ignores or blocks such possibilities for others, we have the right to, perhaps are even obliged, to resist. Who is the criminal: the person flying every year for a holiday, or the person sabotaging a new landing strip? The person driving 170 km/hour in a new SUV, or the person trying to prevent this by letting the air out of their tires? And what about the person stopping the transport of palm oil or coal to the power plant?

In terms of the South: we should support peasants in their struggle against the introduction of plantations and monoculture crops for the Global North. These people and their countries have been exploited long enough to make the over-consumption in the north possible.

Besides direct action, there is a long way to go in terms of awareness-raising and actively promoting sustainable and social alternatives.

Action



"Nahrung oder Benzin - Ihre Wahl"

"Food or fuel - Your choice"

Pictures from actions in front of petrol stations in the German town Bonn, during the UN summit on Biodiversity, May 2008



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