The Greenpeace Climate Vision

Background Note No.8

Changing lifestyles and consumption patterns

Governments worldwide are seeking ways to tackle climate change. The strategies on the table to reduce greenhouse gas emissions are almost entirely based on a business-as-usual approach: that is to say, developing cleaner technologies and improving efficiency. Trends of increased consumption are taken as given, the role of technology being to provide for this demand. Major technological and managerial improvements are essential, but will not by themselves ensure we achieve the zero emissions pathway needed to keep temperature rise as far below 2°C as possible.

For transport and for the food chain, as well as other areas of commercial and individual consumption, there is a pressing and unavoidable need for lifestyle and behavioural changes.

Technological developments alone are not enough to mitigate climate change since they do not address the trends in our consumption patterns that are inherently greenhouse gas-intensive. Our society is not only addicted to oil and other fossil fuels, we have also generated lifestyle and consumption patterns that are unsustainable. They are based on an assumed unlimited availability of natural resources and land. The globalisation of both consumption and production of goods, and the international trade they encompass, has created huge additional pressures on the environment and on the climate in particular. Growing populations and incomes, along with new lifestyle and consumption preferences and aspirations, are rapidly increasing the demand for new food diets, more cars and more electrical and electronic equipment, while globalisation is boosting trade in these commodities.

The consumer society has strong allure and carries with it many economic benefits, and it would be unfair to argue that the advantages gained by an earlier generation of consumers should not be shared by those who come later. But we need to ensure that global consumption is more sustainable than today, and that consumption is reduced in high-income countries and slowed down in developing countries, in order to avoid increasing the level of damage caused by climate change and greenhouse gas emissions.

While lifestyle changes are possible with regard to all our consumption patterns, we have identified the following three sectors as having substantial potential for reducing greenhouse gas emission:

- Transport (14% of global greenhouse gas emissions)
- Meat and dairy consumption (18-30% of global greenhouse gas emissions)
- Electrical and electronic equipment

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Transport

Any business-as-usual scenario foresees greenhouse gas emissions from transport growing exponentially. Increased use of passenger vehicles and expansion of the aviation sector are said to be responsible for this growth. In order to reduce emissions, investments need to be made not only to promote the use of low-carbon vehicles but also to reduce the amount of kilometres driven. This can be accomplished through reducing the need for transport, shifting people to non-motorised transport or by changing transport modes, for people and freight, to less-emitting means such as rail and public transport instead of cars, trucks and planes.

In a landmark study for the OECD International Transport Forum[1], Goodwin concludes that there is rich evidence that a reduction in car use up to 30% is possible. The Victoria Transport Policy Institute[2] states that a similar reduction is possible with regard to freight transport. A NEF study on aviation claims that 45% of all European flights are over distances of less than 500 kilometres; this transport need could be better served by high-speed trains, while a significant amount of the increasing use of international flights can be cancelled out by promoting videoconferencing and regional tourism.[3]

The Greenpeace/EREC Energy [R]evolution scenario provides some reduction in transport demand, but this is limited in terms of geographical scope (no reductions in developing countries) and ambition (depending on the transport sector concerned, ranging between -7.5% and -15%).

Greenpeace believes that a concerted effort to reduce transport demand by a wide range of policies (see Annex 1) could bring about an overall global reduction of transport demand – in addition to the reductions and modal shifts already provided for in the Energy [R]evolution scenario - of 15%.

This reduction of transport demand by 15%, on top of the emission reductions in the energy sector (see Greenpeace Climate Vision Background Note No. 1), will reduce energy demand in the transport sector from 77,108 PJ a year to 65,542 PJ a year, and would reduce fossil fuel use by 31%. A similar reduction in CO_2 emissions would reduce these emissions by 812 $MtCO_2$, from 2,620 $MtCO_2$ to 1,808 $MtCO_2$.

Meat and dairy consumption

'Please eat less meat – meat is a very carbon-intensive commodity'
Dr. Rajendra Pachauri, Chair of the IPCC and joint-winner of the Nobel Peace Prize 2007[4]

Greenpeace proposes a decrease in the average worldwide consumption of animal products. We recommend that policy be developed to address the rapid global growth in meat consumption. This will not only benefit the climate but will also reduce negative health impacts of meat consumption.

Based on current trends, livestock production is projected to increase dramatically during the next 40 years, primarily in countries of low or middle income. Even the universal application of available technologies to reduce emissions from livestock production would not significantly reduce non–CO_2 emissions (see 'Cool Farming'[5]).

Therefore, a contraction and convergence strategy with reduced consumption of livestock products is needed. At present, average meat consumption is 100 g a person a day worldwide, but these figures differ strongly between rich and poor countries. Average meat consumption in developed countries in the year 2000 was 90 kg a person a year while in developing countries this was 27 kg.

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1 Goodwin P. 2008: Policy Incentives to Change Behaviour in Passenger Transport. OECD International Transport Forum, Leipzig, May 2008.

2 Victoria Transport Policy Institute. 2008: TDM Encyclopaedia. Updated October 2008.

3 Johnson V. et.al. 2008: Plane truths: Do the economic argumentations for aviation growth really fly. NEF and World Development Movement, September 2008.

4 AFP. 2008: Lifestyle changes can curb climate change: IPCC Chief. 15 January, 2008: afp.google.com/article/ALeqM5iIVBkZpOUA9Hz3Xc2u-61mDlrw0Q

5 Greenpeace International. 2008: Cool Farming

According to a landmark study of the UK Food Climate Research Network[6], it is possible to bring greenhouse gas emissions from livestock back to 2000 levels. This would need a strong reduction of global per capita consumption of meat and dairy products. In this scenario, assuming a global population of 9 billion people in 2050 and no substantial technological improvement in livestock-related greenhouse gas reduction practices, average global annual per capita consumption of meat and dairy will have to be reduced to 25 kg and 53 kg respectively. This means that people in industrialised countries will have to bring down their high levels of meat and dairy consumption to the current average per capita consumption level in developing countries.

Reducing BAU 2050 emissions from cattle and manure (3,814 $MtCO_2$-e a year), the two components of greenhouse gas emissions from livestock, to 2000 levels (2,220 $MtCO_2$-e a year) would reduce greenhouse gas emissions with 1,594 $MtCO_2$-e a year by 2050.

Although this seems a very ambitious pathway, it is the only adequate response to the latest findings on healthy and sustainable food production methods from the World Health Organisation (WHO) and the UN Food and Agriculture Organisation (FAO). In high-income countries, decreased meat consumption (contraction) should improve health by lowering the risk for heart diseases related to saturated fat in domesticated animal products, as well as the risk for obesity, and cancer. In low-intake populations, increased consumption of animal products towards the proposed global mean figure (convergence) should also improve health.

Electrical and electronic appliances

The number of electrical and electronic appliances appearing in western households is rapidly increasing. Irrespective of the energy efficiency of these appliances, for some of them questions can be posed about the level of their use or their necessity at all.

If we want to tackle climate change we will need to re-evaluate the way we use electricity, and whether we really need all of our electrical and electronic equipment or whether we can do without it. It is extremely difficult to calculate what potential exists (as compared to the reference scenario) for further reducing electricity-use through implementing policies and awareness-raising campaigns that inspire people to limit the use of electrical and electronic appliances. However, we believe extra effort here can lead to fully using the technical potential of energy efficiency and conservation as identified in the Ecofys study on energy efficiency potential that was undertaken for Greenpeace's Energy [R]evolution scenario. Applying the full potential identified would further reduce primary energy demand as provided in the Energy [R]evolution scenario by 1% every 10 years.

This would reduce the amount of fossil fuel use in the Energy [R]evolution scenario by 6% and lead to a potential emission reduction of 453 $MtCO_2$ a year by 2050 (6% of total energy emissions of 7,543 $MtCO_2$ a year).

Total

The total potential for greenhouse gas emission reductions identified for these three lifestyle measures would be 2,859 MtCO2-e a year by 2050.

6 Garnett T. 2008: Cooking up a storm. Food, greenhouse gas emissions and our changing climate. Food and Climate Research Network and Centre for Environmental Strategy/University of Surrey, September 2008

Annex 1. Transport demand management

Transport demand management refers to a wide variety of strategies, programmes and activities that aim to change travel behaviour (if, how, when and where travel takes place) in order to increase transport efficiency and achieve specific objectives. Transport demand management often has multiple benefits; for example, improving public transport improves equity, since it increases access to transport, improves safety because it reduces the number of vehicles in use, reduces congestion and reduces polluting emissions.

There are many different measures that fall under the category of transport demand management. Each of these measures will in many cases have only a limited impact of changing traffic by at most a small percentage. However, measures can have a cumulative and synergistic effect, and thus having even more impact, if they are combined. Phil Goodwin of the Centre for Transport and Society of the University of the West of England advises that 'the evidence available is rich concerning reductions in car use up to about 20%-30%, but very sparse, at the present time, for changes greater than that'[7], while the Victoria Transport Policy Institute's Transport Demand Encyclopaedia[8] concludes that even higher reductions can be achieved with regard to air travel and the use of trucks if also overall consumption patterns are changed.

Greenpeace urges governments to develop and implement, at all levels of administration (local, regional, federal, international) a coherent and ambitious transport demand management strategy, focusing on:

- investments in developing and improving low-emitting transport options, such as investments in public transport, in non-motorised transport infrastructure, in improving integration between transport modes, ensuring road preference for common transport, etc;

- marketing and awareness-raising to change travel behaviour, such as through marketing and awareness-raising for public and non-motorised transport, but also for reducing and improving transport, through for example freight transport management policies, promoting and enabling teleworking, promoting car-sharing and ride-sharing initiatives, high occupant vehicle priority, and road space reallocation. According to the OECD[9], a freight energy efficiency management programme could reduce emissions from freight transport by 15-30% in 10 to 20 years;

- the development of fiscal incentives to change travel behaviour, through for instance: distance-based emissions fees, fuel tax increases (especially on kerosene/paraffin), commuter financial incentives, congestion pricing, road pricing, parking pricing. A distance-based emissions fee in California has reduced emissions in certain cities by up to 20%[10];

- improving more efficient land-use and spatial planning, through road space allocation and high occupant vehicle priority, parking management (incl. parking pricing), least-cost transportation planning (compared to capacity expansion investments to investments in reducing demand), ride-sharing facilities, new urbanism, and land-use clustering.

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7 Goodwin P. 2008: Policy Incentives to Change Behaviour in Passenger Transport. OECD International Transport Forum, Leipzig, May 2008.

8 Victoria Transport Policy Institute. 2008: TDM Encyclopaedia. Updated October 2008.

9 OECD. 2000: EST! Environmentally Sustainable Transport; Futures, Strategies and Best Practices. Organisation for Economic Co-Operation and Development.

10 Litman T. 2007: Socially Optimal Transport Prices and Markets. Victoria Transport Policy Institute.

Annex 2. Reducing meat and dairy consumption

Although technical/managerial solutions (sustainable agriculture) can reduce greenhouse gas emission from agriculture (see Greenpeace Climate Vision Background Note No. 3), there is a need for changes in the consumption of animal products. The world population is expected to grow by 50% to 9 billion in 2050, and as people get richer they also eat more meat.

The livestock sector[11] is a major player, as it is responsible for 18% of greenhouse gas emissions[12] (see Table 1).

Table 1: greenhouse gas emissions derived from human-related activities in the livestock sector, including emissions from land-use change.

Source of emission	**Percentage of total contribution to human-induced greenhouse gas emissions**
Total greenhouse gas emissions from animal production	18% of total human-induced greenhouse gas emissions
Compare: greenhouse gas emissions from transport (road, air, rail and sea)	14% of total human-induced greenhouse gas emissions
Carbon dioxide (CO_2) emissions from animal production	9% of total human-induced greenhouse gas emissions
Methane (CH_4) emissions from animal production	37% of total human-induced CH_4 emissions
Nitrous oxide (N_2O) emissions from animal production	65% of total human-induced N_2O emissions
Ammonia emissions from animal production	64% of total human-induced ammonia emissions

Source: Steinfeld et al (2006) [13]

One single kilogramme of beef is responsible for more greenhouse gases than driving approximately 80-100 kilometres by car. In addition, consumption of dairy products also leads to greenhouse gas emissions, with the dairy industry accounting for about 23% of UK food emissions, for example.[14]

Increasing prosperity is accompanied by a concomitant rise in meat and dairy consumption. As a result, demand for meat and dairy products is set to double by 2050, not only because there will be more people on the planet, but also because they will, in general, be eating more animal-derived food (see Table 2).[15]

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11 The livestock sector is a complicated term to define- it usually includes everything from pastoral herders in sub-Saharan Africa to industrial poultry factories in Europe. Livestock products here include meats, eggs and dairy products primarily produced in intensive animal farming.

12 Bellarby, J, Foereid, B, Hastings, A, and Smith (2008) *Cool Farming: Climate Impacts of Agriculture and Mitigation Potential,* p.p. 5, Published for Greenpeace January 2008.

13 Steinfeld et. al., (2006) Livestock's Long Shadow – Environmental Issues and Options, FAO Publication, Rome 2007

14 Garnett, T. (2007) *Meat and dairy production & consumption: Exploring the livestock sector's contribution to the UK's greenhouse gas emissions and assessing what less greenhouse gas intensive systems of production and consumption might look like*. Food Climate Research Network, University of Surrey, UK

15 Bellarby, J, Foereid, B, Hastings, A, and Smith (2008) *Cool Farming: Climate Impacts of Agriculture and Mitigation Potential,* Published for Greenpeace January 2008

Table 2: Meat and dairy demand in 2000 and predicted demand in 2050

	2000 (population 6 billion)	2050 (population 9 billion)
Average per capita annual global demand (tonne) - Meat	0.0374	0.052
Average per capita annual global demand (tonne) - Milk	0.0783	0.115
Total annual global demand (tonne) - Meat	228	459
Total annual global demand (tonne) - Milk	475	883

Source: Data is based FAO (2006)[16]

Global meat production is projected to more-than-double from 229 million tonnes in 1999/2001 to 465 million tonnes in 2050 while milk output is set to climb from 580 to 1043 million tonnes. [17]

However, the magnitude and relative importance of the different sources and emissions varies widely between regions. Indeed, there will still be huge global inequalities in consumption levels between the rich and the poor for meat and milk respectively. The projected increase in meat and milk production in developing countries for the year 2030 will rise up to 37 kg of meat a person a year (as compared to 28 kg for 2002), and 66 kg of milk a person a year (as compared to 46 kg in 2002). The projected increase in meat and milk production in developed countries for the year 2030 will rise up to 89 kg of meat a person a year (as compared to 78 kg for 2002), and 209 kg of milk a person a year (as compared to 202 kg in 2002).[18] These average figures disguise huge global inequalities in consumption.

The average consumption of grain and forage for production of 1 kg of animal products shows that producing lamb and beef requires between four and ten times more grain than producing pigs or chicken. For ruminants, methane production further increases greenhouse gas emissions for each unit of food. Therefore, the consumption of less meat will save greenhouse gases, as will the consumption of poultry instead of beef or lamb.[19] A person with an average US diet for example, could save 385 kcal (equating to 95 g – 126 g) of fossil fuel a day by replacing 5% of meat in the diet with vegetarian products.[20]

Foster *et al.,* (2006) calculate that the energy needed to produce 1 kg of sheep meat is 23 MJ, 1 kg of poultry is 12 MJ and 1 kg of potatoes is 1.3 MJ in the UK. [21] While both a plant-based and a meat-based diet in developed countries require significant quantities of non-renewable fossil fuel, a meat-based diet requires more (see Table 3).[22]

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16 Food and Agricultural Organisation of the United Nations (2006) *Prospects for food, nutrition, agriculture and major commodity groups. World agriculture: Towards 2030/2050* Interim report Global Perspective Studies Unit, FAO, Rome, June 2006.

17 Food and Agricultural Organisation of the United Nations (2007) *Livestock's Long Shadow – Environmental Issues and Options,* FAO Publication, Rome 2007

18 Ibid.

19 Bellarby, J, Foereid, B, Hastings, A, and Smith (2008) *Cool Farming: Climate Impacts of Agriculture and Mitigation Potential,* p.p. 36, Published for Greenpeace January 2008

20 Bellarby, J, Foereid, B, Hastings, A, and Smith (2008) *Cool Farming: Climate Impacts of Agriculture and Mitigation Potential,* p.p. 9, Published for Greenpeace January 2008

21 Foster, C., Green,K., Bleda,M., Dewick,P., Evans,B., Flynn,A., Mylan,J.. (2006) Environmental Impacts of Food Production and Consumption: A Report to the Department for Environment Food and Rural Affairs, pp. 1-199. Defra, London, Manchester Business School

22 Pimentel D. and Pimentel M. (2003) "Sustainability of meat-based and plant-based diets and the environment" *American Journal of Clinical Nutrition* 78, p.p. 660S-6663

Table 3: Global warming potential of the main meat categories, milk, and selected plant products

Product	**Global warming potential** (kg CO_2 –eq per kg of product)
Sheep	17.4
Beef	12.98
Pig	6.35
Poultry	4.57
Milk	1.32
Bread wheat	0.80
Potato	0.21

**kg equivalent on a 100 year time scale per kg product*

Source: Foster el al. 2006[23]

[23] Foster, C., Green, K., Bleda, M., Dewick, P., Evans, B., Flynn, A., Mylan, J. (2006) Environmental Impacts of Food Production and Consumption: A Report to the Department for Environment Food and Rural Affairs, pp. 1-199. Defra, London, Manchester Business School

Table 4: Recommendations on how to consume less greenhouse gas-intensive food

Action	Impact area addressed	Comments
Eat fewer meat and dairy products	N_2O and CH_4 emissions; lost carbon sequestration from possible land clearance overseas	A reduction of one-third would be roughly equivalent to an individual, who eats meat daily, eating meat only 5 days a week or alternatively reducing portion sizes of meat and dairy products and substituting plant-based foods such as pulses, grains, vegetables and fruit
Eat less (that is, do not eat more than you need to maintain a healthy body weight)[24]	A significant reduction in meat and dairy consumption would improve public health and reduce the prevalence of obesity, certain heart conditions and cancers. This would have a positive impact on related healthcare costs	Overconsumption of food is part-and-parcel of a society in which consumption and consuming is its *raison d'être*. The 'eating less' agenda should be seen as part of a broader requirement to consume less overall
Switching to more seasonal and local food	Refrigeration, transport, food, spoilage	Consumers would eat a lower volume of higher quality meat and milk, preferably from local farmers. Farmers would earn a premium for their products, and higher prices would reflect the carbon costs of consuming meat and milk
Increasing consumption of organic or certified / assured food	N_2O and CH_4 emissions; lost carbon sequestration from possible land clearance overseas; localisation of animal production and consumption would support rural communities and businesses	Farmers would be enabled to reduce stocking density, move from intensive to extensive methods, and raise animal welfare standards up to the best free-range and organic farming standards of today, while protecting their livelihoods
Wasting less food in the home	Embedded emissions – in theory, lower levels of production permitted	Wasted food represents a waste of embedded emissions and raises structural system questions that are linked to the whole 'consuming less' debate

[24] For example, in the US the average American consumer 1,000 kg of food per year, this contains an estimated 3,747 kcal. This is well above the Food and Drug Administrations recommended average daily consumptions of 2,000 to 2,500 kcal. Reducing calories intake would significantly reduce the energy used in food consumption (see Pimentel et al., 2008)