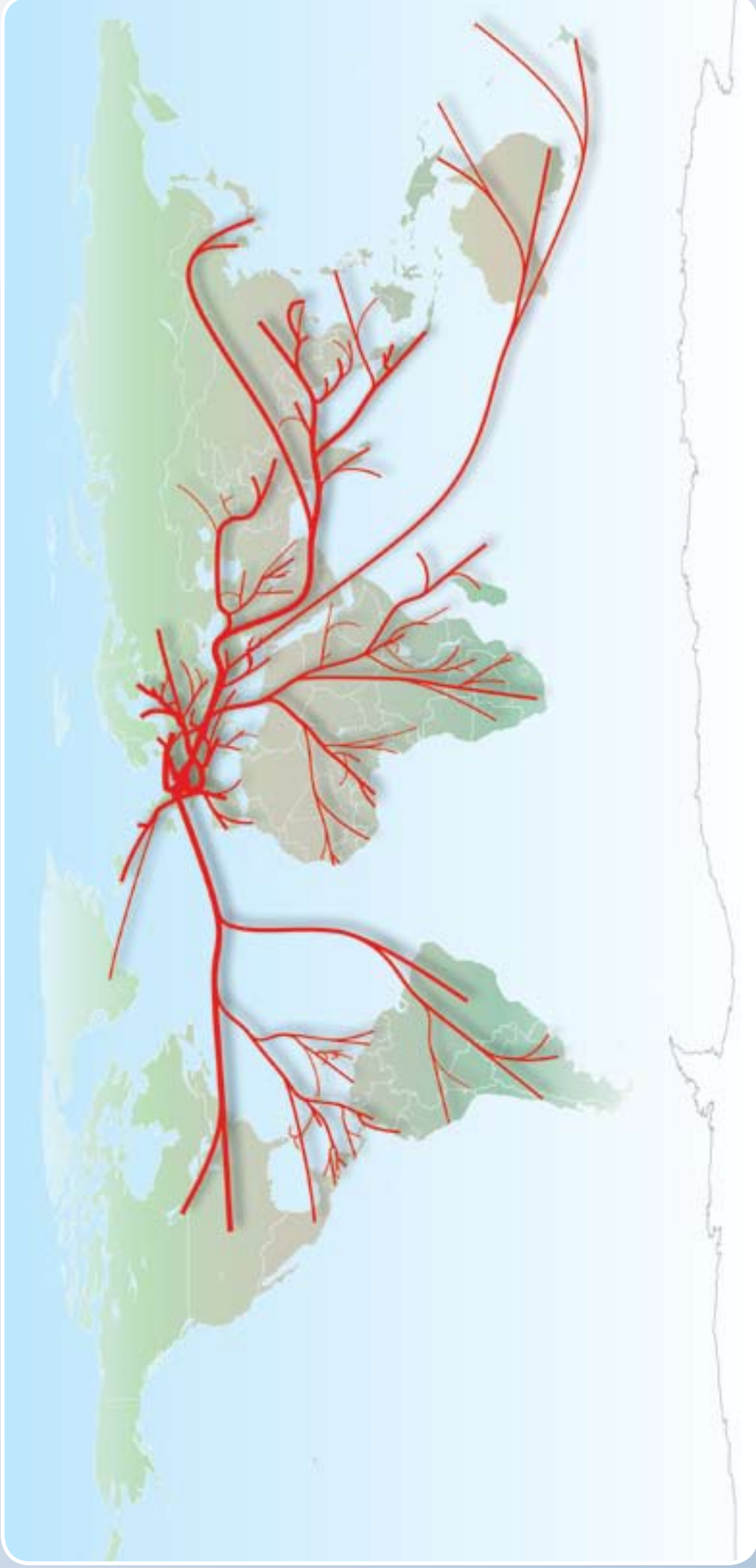




CHINADEPENDENCE

The second UK Interdependence Report

The UK's global ecological footprint



The United Kingdom consumes products from around the world creating a large ecological footprint. The footprint measures natural resources by the amount of land area required to provide them. This map shows flow lines for imported resources that make up our footprint. To attribute impacts properly to the UK consumer, the area required to produce imported goods – a standardised measure of resource use called global hectares or gha - is subtracted from the footprint of the producing countries and is added to the UK's account. The map is based on data for the total footprint of imports, and summed across product categories. NB: Europe as a source of products is shown disproportionately large because adjustments are not made for re-exports due to the complications of tracing certain goods. This may create a bias suggesting that more raw resources come from European ports when in fact it was merely their most recent port of call on their way from the original source.



Our way of life in the UK would be unthinkable without the human, cultural, economic and environmental contributions made by the rest of the world. Our global interdependence is inescapable. But it can also be troubling. The burden in terms of resource consumption that our lifestyles exert on the fields, forests, rivers, seas and mines of the rest of the world is increasing. Our dependence on China is growing rapidly. In terms of a typical calendar year the world as a whole now goes into ecological debt on 6 October. In the face of collective challenges like global warming, it makes clear that the UK's patterns of interdependence will have to change if our economy is to become remotely sustainable.

Contents

Executive summary	2	Natural resources flows: energy, trade and food	21
China becomes the UK's 'environmental laundry'	2	Energy	21
Introduction: A declaration of interdependence	7	Water vs Fuel	23
The rise of Chinadependence	9	Trade	26
The Environmental Laundry: how China takes the blame for Western carbon emissions	10	Food	27
The Carbon ship keeps coming in...	11	Fish and ships	28
Environmental dominoes	13	Ecologically wasteful trade	29
The many costs of low prices	15	Financial flows	31
Trends in UK interdependence	17	Conclusion	32
Cultural and human flows	18	Appendix 1: The Interdependence Project	34
Human movements	18	Appendix 2	35
Recruitment and migration in health and education	19	Endnotes	37

Executive summary

‘The road from hand to mouth is short and easy enough with men at first, but as society grows, and division of labour is made, producers and consumers of food become widely separated, and the question of transportation becomes exceedingly important. When the hands of producers and the mouths of consumers are distanced by the space of half a continent and even half a globe, the road from hand to mouth is a long one, and oftentimes “a hard road to travel”’¹

Joseph Dart, nineteenth-century entrepreneur

Our way of life in the UK would be unthinkable without the human, cultural, economic and environmental contributions made by the rest of the world. Our global interdependence is inescapable. But it can also be troubling. The burden in terms of resource consumption that our lifestyles exert on the fields, forests, rivers, seas and mines of the rest of the world is increasing. Perversely this comes as other research shows that a high quality of life is as easy to achieve at very low levels of consumption as at high levels, and as there is increasingly wide appreciation that the pursuit of high-consuming lifestyles undermines well being.^{2,3}

We are demanding in other ways, too. Without skilled immigrants, for example, our schools and hospitals (and football teams) would struggle. Sometimes, however, the environmental costs we create are very hard to explain. Why on earth, say, would the UK export 20 tonnes of mineral water to Australia, and then re-import 21 tonnes? In the face of collective challenges like global warming, it makes clear that the UK's patterns of interdependence will have to change if our economy is to become remotely sustainable.

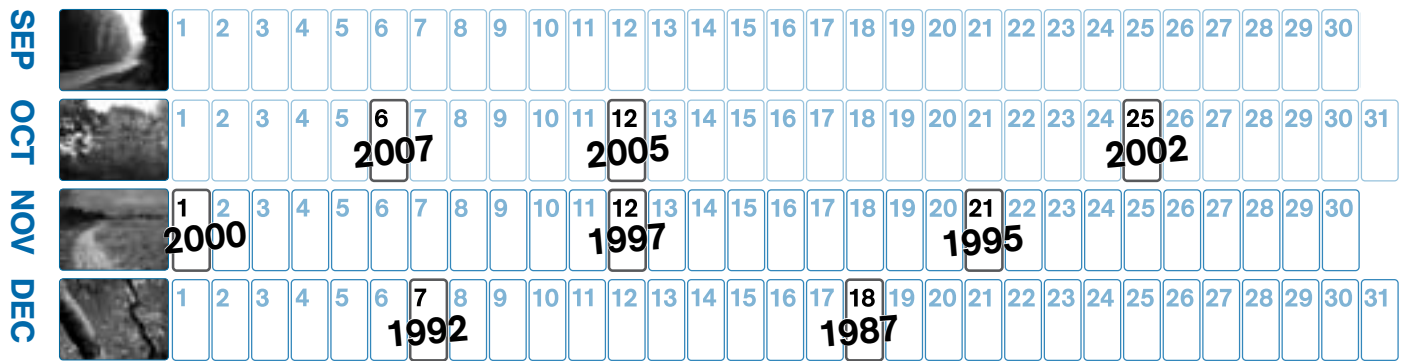
China becomes the UK's ‘environmental laundry’

The first *UK Interdependence Report* exposed how the burden of the nation's high-consuming lifestyle is exported around the globe.⁴ This report reveals that the UK's dependence on the rest of the world for basics such as food and energy is still rising. In particular, it shows the dramatic rise of imports from China.

Globally, consumption is also being driven up by Western lifestyles and by people in other parts of the world seeking to emulate such ways of living. Because of that, the world is going deeper into ecological debt as we take more than can naturally regenerate from the ecosystems upon which we depend. This pattern of consumption, coupled with extreme global inequality, is set to wreck international attempts toward poverty eradication through environmental degradation.

The UK now has the world's fifth-largest economy behind China, Germany, Japan and, in first place, the United States.⁵ Since **nef** published its first *UK Interdependence Report* in April 2006, China and the UK have swapped places, and the UK has become increasingly dependent on a wide range of Chinese imports. This report also shows that, as we fill our homes with ever more products imported from China, we are turning the Asian nation into our ‘environmental laundry’.

World ecological debt day calendar



One way of illustrating our impact on the environment that brings a sense of perspective, comes from looking at the day in a typical calendar year when the world, in effect, starts overshooting its biocapacity and begins eating into its stock of natural resources. The planet can tolerate a little give and take without environmental collapse as long as, in total, humanity lives within its overall ecological budget. The last year that humanity's levels of resource use fell within the means of our life supporting natural assets was 1987. As global consumption grows, the day each year when the world as a whole goes into ecological debt creeps ever earlier in the calendar year. In 1995 it was 25 November. By the turn of the millennium world ecological debt day had advanced to 1 November. In 2007, the world's human population as a whole goes into ecological debt on 6 October.

Here are key findings from *Chinadependence – the second UK Interdependence Report*:

- The world is going deeper into ecological debt:** The world population as a whole is also living ever further beyond the capacity of earth's ecosystems to regenerate. It can be seen, for example, in the collapse of fish stocks in the oceans. The clearest demonstration comes, perhaps, from looking at the day in a typical calendar year when the world, in effect, starts eating into its stock of natural resources and goes into ecological debt. The date has been creeping ever earlier in the year since the world first entered deficit in the 1980s. As a whole, the world's human population now goes into debt on 6 October.⁶ Things are much more extreme where many wealthy countries are concerned. If everyone in the world wanted to live like people in the UK, for example, on a very conservative estimate, we would need over three planets like Earth.
- Chinadependence:** UK imports from China have risen massively in recent years both in value and volume. In the last year alone, our spending on imports from China rose 18 per cent to £15.6 billion and, more important environmentally, imports rose 10 per cent by weight to a total of just under 6.5 million tonnes. Over the past five years, our spending on, and the weight of imports have risen by over 125 per cent and 114 per cent respectively.⁷ We are ever more clothing ourselves, furnishing our homes, watching television, listening to music, playing games with our children and even decorating our Christmas trees, courtesy of goods manufactured in China. In 2006, we imported 60,000 tonnes of Christmas decorations alone. Several problems arise from this trend. China is increasingly blamed for its levels of pollution in general, and its rising greenhouse gas emissions in particular.⁸ But it is demand from countries like the UK which leads to smoke from Chinese factories and power plants entering the atmosphere. As a result, China has become the environmental or 'carbon' laundry for the Western world. Because China's energy mix is more fossil-fuel intensive than those of Europe, Japan or the USA, it also means that outsourcing to China creates more greenhouse gas emissions for each product made.
- The UK's ability to feed itself declines further:** Continuing a trend begun in the early-to-mid 1990s, the UK's self-sufficiency in providing food continues to fall. Even allowing for changes in the way the Government calculates its figures, our ability to feed ourselves, without depending on imports from overseas, is at its lowest ebb for half a century. For all food, the UK's self-sufficiency is now 27 per cent lower than it was in 1990, and has dropped seven per cent since 2002.

- **The UK is less able to meet its own energy needs:** In 2004, the UK lost its status as an energy independent nation. Since then we have relied on imports to balance supply and demand. Even though the country has huge untapped renewable energy sources, for example some of the best supplies of potential wind energy in Europe, our dependence on energy imports is increasing. By comparing net energy imports with primary energy demand in the UK, we find that since losing self-sufficiency in 2004, our 'energy dependence' has increased almost four fold. However, to stop and reverse the slide, all of the following could help: an obligation on suppliers to reduce demand, coupled with higher mandatory efficiency standards, the widespread uptake of renewables and a shift to more decentralised energy generation.
- **Dependence on international trade goes up despite rising fuel prices and fears about climate change:** International trade makes up a growing share of the UK's income. Trade as a share of GDP is at its highest point for over four decades and on an upward trend.
- **Ecologically wasteful trade is still rife in the UK economy:** In the first UK Interdependence Report, we revealed from official trade statistics, the odd and extraordinary fact that the UK imported and exported substantial and virtually identical quantities of goods such as gingerbread, and a whole range of other products. Because of the environmental and fuel costs involved, we termed this, 'ecologically wasteful trade'. This year, taken from a whole new set of trade statistics, it seems that examples of environmentally wasteful trade are just as common (Table 1).

In 2006, the UK imported 14,000 tonnes of chocolate covered waffles, and exported 15,000 tonnes. We both imported and exported between ourselves and Italy, 600 tonnes of, 'gums and other jelly confectionary'. We sent 21 tonnes of mineral water all the way to Australia and brought 20 tonnes all the way back. Nine hundred tonnes of full-fat milk powder went from the UK to Germany, and 800 tonnes came back. We managed to export 64 tonnes worth of vacuum cleaners to Italy, and import 73 tonnes. The large, two-way traffic of beer between Spain and the UK is also almost identical in amount.

- **The UK still relies on health and education workers from poor countries:** As issues of immigration refuse to leave the mainstream political debate, and even party leaders bemoan the scale of foreign nationals moving to the UK, the reality appears to be that many of our vital public services could not function without the arrival of skilled professionals from overseas. In the last five years alone, the UK has imported 289 trained nurses from Malawi, 364 from Botswana and 757 from Zambia. South Africa, Ghana, Kenya, Lesotho and Zimbabwe also send nurses trained in the health systems of Africa to work in the NHS.⁹ Since 1997 over 90,000 international nurses have registered in the UK, representing around four out of every ten of all first time registrations.¹⁰ The popular myth of the UK being a soft-touch for health tourists, masks a reality in which we are being tended in our sick beds by nurses that many poor countries can ill afford to lose.

Table 1: Examples of ecologically wasteful trade (See Table 6 for full list)

Ecologically wasteful trade	Trade partner	Import (tonnes)	Export (tonnes)
Chocolate covered waffles and wafers (small packs)	All partners	14,137	15,856
Gums and other jelly confectionary	Italy	612	665
Milk powder (>27% fat) large packs	Germany	975	874
Potatoes (fresh, not new)	Middle East & North Africa	4,018	3,870
Ice cream	Sweden	2,257	2,297
Mineral water (unsweetened / not flavoured)	Australia	21	20
Domestic vacuum cleaners	Italy	64	73

Source: www.uktradeinfo.com (2006)

- **UK: important aid donor or haven for money on the run?** In 2006, nef revealed that in spite of the UK Government's commitment to increasing its aid budget, another barely noticed trend cast questions over the nation's financial role in relation to developing countries. According to figures from the Bank of England, in a single year, 2005, money from developing countries deposited in UK banks surged by over \$115 billion to reach a total of \$385 billion. That trend continued in 2006 with an even larger surge of \$124 billion lifting total deposits to \$514 billion. The year saw a \$5 billion rise in deposits from just one country, Nigeria, dwarfing any improvements in the UK's aid performance. This was during a year in which Nigeria continued to be torn by internal strife over the distribution of benefits from its potentially hugely lucrative oil sector. Overall, a range of factors will be influential but, generally, the removal of controls over the movement of money around the world, and 'capital flight' are both likely factors.

In an illustrative overview of the UK's place in the international system, this report reveals how the nation is being woven into an ever closer and more complicated international economic, cultural and social fabric, with both positive and negative consequences. A positive future, it suggests, will only be guaranteed through a paradigm shift in government policy away from 'beggar-thy-neighbour' economic competitiveness, towards the cooperation demanded by our inescapable interdependence.

How the world goes into ecological debt by 'overshooting' Earth's biocapacity

The ecological footprint is a measure that reveals our global interdependence. There are several indicators available to measure aspects of the content – ecological and otherwise – of trade. They can measure the ecological weight, or value, of trade flows in terms of matter, energy, or land. The crude tonnage of goods traded can be looked at, and to this can be added the additional weight of material involved in getting the final product. For example, to extract uranium as fuel for nuclear reactors the waste ore would be included in the footprint, or, when fishing for tuna, the dolphins caught and killed would also be part of the impact. Widening the criteria still further requires a measure of all of the energy involved in producing and delivering a product to the final consumer – so called 'embedded energy', (shown as giga joules (GJ)). ¹¹

The ecological footprint measure is exactly what it sounds like. It estimates the full ecological impact of a particular product or activity. By gathering together a record of all the impacts that can be traced back to an individual company or country, it is possible to calculate their ecological footprint. The footprint measures how much 'biocapacity' land area is required to sustain a given population at present levels of consumption and technological development. Biocapacity is a composite of the ability of ecosystems to produce the things we need, like food, and their ability to absorb our wastes, such as greenhouse gases.

If a country's footprint is larger than its available biocapacity, it means that it is relying on someone else's ecological resources to satisfy its levels of consumption. No individual country has to live entirely within its environmental means, but the planet as a whole does. If, collectively, our levels of consumption exceed what Earth has available, we begin to run down our life supporting natural assets. Because ecosystems under stress behave unpredictably, it is often impossible to know when a system under stress will crash if, and as, we take more than can naturally regenerate.

One way of illustrating the footprint that brings a sense of perspective, comes from looking at the day in a typical calendar year when the world, in effect, starts overshooting its biocapacity and starts eating into its stock of natural resources. The day each year when the world goes into ecological debt has been creeping ever earlier in the calendar since the world first entered deficit in the 1980s. **In 2007, the world's human population as a whole goes into debt on 6 October.**¹²

The footprint is a conservative measure of the planet's surface area needed to sustain the flow of a given natural resource, whether a food crop or a building material. One reason it is conservative is that the threshold for available biocapacity assumes that all the planet's resources are available for human use. In fact, the healthy functioning of ecosystems almost certainly demands that significant areas of the globe be left fallow. There is, however, no scientific consensus on how much. This means that our assessment of human over-use of natural resources could be a significant underestimate. The footprint is measured as standardised 'global-average hectares' or gha. Data to calculate the footprint come from the UNSD COMTRADE database and the National Footprint Accounts generated by the Global Footprint Network (see Appendix 2), which itself draws data from standard (largely UN-based) internationally comparable data sets that assess, for example, the state of the planet's forests, fisheries, and agriculture.

A short history of declaring interdependence

The concept of global interdependence as something that needs to be negotiated between nations and people has been rising since the first half of the twentieth century. Gandhi, who led India's independence movement, said in 1929, 'Interdependence is and ought to be as much the ideal of man as self-sufficiency. Man is a social being... If man were so placed or could so place himself as to be absolutely above all dependence on his fellow beings he would become so proud and arrogant as to be a veritable burden and nuisance to the world.'¹³

Shortly after, on 4 March 1933, catching an emerging mood of the time, Franklin Roosevelt said in his inaugural presidential address, 'If I read the temper of our people correctly, we now realize as we have never realized before our interdependence on each other; that we cannot merely take but we must give as well,' before dedicating himself to a 'disciplined attack upon our common problems'.¹⁴ The American writer and philosopher Will Durant created 'Declaration of INTERdependence' that entered the Congressional Record in 1949. It was aimed at promoting racial tolerance.

In the post-war period scientific progress prompted a different kind of thinking about an interdependent world. The first International Geophysical Year of 1957/1958 raised the notion of plate tectonics – the first global theory in Earth sciences. Integrated analyses of land sea air and ice paved the way for thinking about the dynamics of the global climate.

At the same time, economic, political and social commentators were beginning to reflect on the implications of our interdependence. Marshall McLuhan wrote in 1962 that 'the new electronic interdependence recreates the world in the image of a global village.'¹⁵ International relations theorists of the 1970s used the term as a forerunner to the concept of globalisation. In *Power and Interdependence*, two academics, Keohane and Nye explored 'multidimensional economic, social and ecological interdependence'.¹⁶

Now there are declarations of interdependence for everything from transport to food and even opportunistic ones designed to promote management consultants. If anything, the idea risks being trivialised. Many, though, capture the spirit of the idea. Environmental group the David Suzuki Foundation launched one at the 1992 Earth Summit in Rio de Janeiro. And another admirably brief and to the point from little-known US group, the Co-Intelligence Institute, begins: 'We hold this truth to be self-evident / We are All / In This / Together.'

A UN conference on human rights in 1993 produced the Vienna Declaration and Programme of Action, which stated that, 'All human rights are universal, indivisible, interdependent and interrelated.'¹⁷ Then Secretary General of the United Nations, Kofi Annan said in 2004:

*'Today, no nation or group of nations, not even the most powerful, can protect itself from threats by turning itself into an impregnable military fortress. No army can prevent capital movements, stop the spread of AIDS, reduce the impact of global warming, halt the flow of information, or reverse the spread of radical violent ideologies which threaten us all... For good or ill, we live in an age of interdependence, and we must manage it collectively.'*¹⁸

Introduction: a declaration of interdependence

“Let Facts be submitted to a candid world”:

The US Declaration of Independence, July 4, 1776

This report, and the *Interdependence Day* project it is part of, sheds light on the ways in which our fates are inextricably bound together with distant and future people, and with the non-human natural world.

There is nothing novel about proclaiming our interdependence. A few minutes casting around a bookshelf would find insights from ecology, theology, psychology, philosophy, economics and more. A web search throws up numerous declarations of interdependence generated over the course of the last few decades by civil rights lawyers and environmental activists. Depictions of interconnectedness and interdependence pervade human culture over millennia.

Interdependence is a ground condition – a simple blunt fact of life. But there are reasons why Western culture has forgotten this until recently. Progressive subdivision of academic endeavour into ever more narrowly focused disciplines from the late nineteenth century onwards; the reduction of economic and political life into a set of atomized market exchanges, and the diminution of cultural life into a pursuit of self-centred, ‘individualised’ leisure and pleasure have all played their part.

There are now urgent reasons why we are beginning to remember our state of interdependence. Knowledge of processes of economic globalisation and global environmental change is emerging at a time when communications technologies have achieved unprecedented speed, reach and availability.

These issues don't just invite us to think in global terms. They demand that we acknowledge long threads of connection between our actions and their consequences. They draw us into an awareness of responsibilities that stretch over great distances.

Globalisation and global environmental change demand that we rethink our notion of who and what counts in politics. For the drafters of the US Declaration of Independence, the drastic revision of political sovereignty they proposed seemed natural: the time had come for government to derive ‘their just powers from the consent of the governed.’ We are now at a time that demands change on a greater scale.

Climate change caused by present and historic emissions of the developed world brings consequences for the poorest in the present, for unborn future generations, and for the non-human natural world. Evidence of dramatic loss of biodiversity that evolved over millennia in the space of just a few decades also stretches the boundaries of the political and the ethical. Knowledge of the human stories that lie behind the material excesses of economic globalisation demand that we rethink where responsibility to others starts and stops.

It is not simply that we begin to acknowledge the waste or harm that our lifestyles and economic systems cause: in doing so we are forced to revise our notion of who and what needs to be given a voice in politics.

This report makes much of the principle of ‘consequence over distance.’ Substantial global trade in the past, such as the trade in porcelain in the eighteenth century, saw the creation of extended networks of production and consumption. These interactions had widely distributed consequences for taste, ideas, life chances and more. Attempts to intervene where consequences were negative are also part

of progressive history: one strand of the campaigns against slavery was a sugar boycott that saw sales of one of the most economically and socially important goods in Britain drop by a third. Ecological change brought about by humans also has a longer history than we sometimes acknowledge. Environmental historians have shown how travel, trade, **urbanisation and industrialization in the eighteenth** and nineteenth centuries saw human societies transform the non-human natural world in substantial ways and over great distances.

But there are things that are different about the present moment. One is the irreversibility in human time frames of some changes, – such as global warming – we are bringing about. Certain consequences will never be undone: extinctions are for ever. These changes are also increasingly difficult to deny. The circulation of people, knowledge, images – the cultural dimensions of globalisation – does not simply press us to think about our responsibilities but also makes us much more aware of the responsiveness of the world to changes we introduce.

The first *UK Interdependence Report* published by **nef** in 2006 reported on some of those changes. It presented a graphic picture of the flow of culture, skills and natural resources between the UK and the rest of the world. It showed how, if left to survive purely on our own domestic assets, life would look very different. It also revealed a country living well-beyond its environmental means, setting an example to the rest of the world that seemed to treat the planet and its biocapacity as if it were a business in liquidation.

This second report reveals that the UK's dependence on the rest of the world for basics such as food and energy is still rising. In particular, it shows the dramatic rise of imports from China. So we begin our exploration of our interdependence there, and then return to a number of key themes which are fundamental to everybody's way of life – food, energy, and skills for vital services like health to see what has changed. We also revisit one of the key contributors to the footprint that our lifestyles leave on the planet – consumption based on ecologically wasteful trade.

The Interdependence Day project is driven by the belief that we can rethink the way the world works, but that this will require sustained effort in political and cultural spheres. With this report and the other aspects of the project we want to provoke new thinking. Although the association with the American Declaration of Independence is delivered with a thick vein of irony – it is not a time to be too modest about saying that another world is possible.

The rise of Chinadependence

“China is now the factory of the world. Developed countries have transferred a lot of manufacturing to China. What many Western consumers wear, live in, even eat is made in China.”

Qin Gang – China’s Foreign Ministry spokesman, June 2007.¹⁹

“The economy has grown at an unexpectedly rapid rate in some local areas, mostly at the cost of the environment, and the supervision departments at the grass-roots level are barely functioning.”

**Chinese State Environmental Protection Administration (SEPA)
Official Zhao Hualin, August 2007.²⁰**

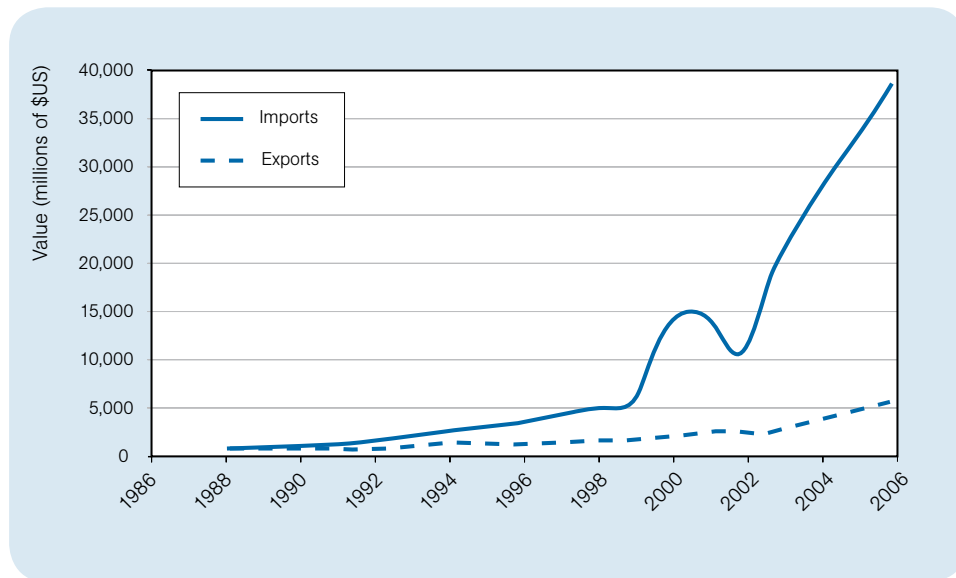
Modern China induces a mixture of fear, admiration and humanitarian concern in the Western observer. Six out of ten people in both the USA and Europe hold the belief that China’s growing economy is a threat and there is growing anxiety over import dependency. They cite competition from low-cost Chinese products and domestic firms relocating to China.²¹ Economically, many believe that China has benefited the most from globalisation. But whatever people feel about the nation, we have all, in the UK and elsewhere, become increasingly dependent on it.

In key respects China differs from the previous economic emergence of other developing countries. It appears that it doesn’t merely enjoy ‘comparative advantage’ in certain areas, as economists like to call it, but potentially absolute advantage in all economic areas, as Janez Potocnik, EU Science and Research Commissioner said in October 2005,²² ‘If we think that the competition from emerging economies such as China and India is simply about low wages and manufacturing, then we are kidding ourselves. These countries are also competing with us in hi-tech, high-skilled sectors because they are investing more and more in research and innovation.’ An OECD study found 15 at-risk job categories in the EU representing 19 per cent of total employment in the pre-enlargement EU.²³

And, it is not just the EU that feels challenged. Harvard economist Richard B. Freeman observed, ‘What is stunning about China is that for the first time we have a huge, poor country that can compete both with very low wages and in hi tech. Combine the two, and America has a problem.’²⁴

In absolute terms, the People’s Republic of China has the second largest economy in Asia and the fourth largest in the World. But, measured in terms of purchasing power parity, it is Asia’s largest economy and second in the world only to the USA.²⁵ Although questions are frequently raised about the reliability of its official data, the recent rapid growth in China over the past 20–25 years shifted over 400 million Chinese out of the most extreme category of poverty (living on less than \$1 per day).²⁶ Between 1979 and 2005, China moved up from a rank of 108th to 72nd on the *World Development Index*.²⁷ It is worth mentioning that this was achieved whilst rejecting most tenets of the so-called Washington consensus that promoted unmanaged markets in other developing countries.

Figure 1: The rise and rise of Chinadependence – the UK/China trade balance from 1988 to 2006



In 1978, China was ranked 32nd in the world in terms of total trade volume, with a trade-to-GDP ratio of around nine per cent.²⁸ Due to the government's export-led growth policies, by 1995 China had risen to 10th position.^{29,30}

China's exports increased at a staggering annual rate of 17 per cent from 1980 to 2001, rising in value from \$18.6 billion to \$266 billion.^{31,32,33} Extrapolating from UN trade data, China has been the world's third-largest exporting economy (not including Hong Kong and Macao), in terms of the value of exports since 2004. Only Germany and the USA remain larger.³⁴

Between 2002 and 2006, however, the value of Chinese exports increased at a rate of approximately 30 per cent a year (Figure 1).³⁵ China also recently overtook the UK as a destination for foreign direct investment.³⁶ Yet, export-led economic growth often masks more negative outcomes.

The Environmental Laundry: How China takes the blame for Western carbon emissions

China's rising Carbon dioxide emissions have been widely reported. But the story is far from straightforward. The trend is not only due to the surge in the economy as 1.3 billion Chinese aspire to Western lifestyles.

In early 2007, a report by the Netherlands Environmental Assessment Agency claimed that China had become the world's biggest emitter of carbon dioxide.³⁷ Emissions from burning fossil fuels the previous year increased by 8.7 per cent. The news created a media furore. Many analysts did not expect China to overtake the USA until 2010 at the earliest.

But, as China is attacked increasingly because of its rising pollution levels, people overlook two important issues. First, per person, China's greenhouse gas emissions are a fraction of those in Europe and the United States.

Second, a closer look at trade flows reveals that a large share of China's rising emissions is due to the dependence of the rest of the world on exports from China – a *Chinadependence*. There is also the fact that a lot of heavy industry has simply relocated to China from apparently cleaner, richer nations.

Because of the way that data on carbon emissions gets collected at the international level, this has the effect of 'carbon laundering' economies like those of Britain and the USA.

Per person, the average Chinese emits only one-quarter of the greenhouse gases of the average UK citizen, and almost one-tenth that of the average person living

in the USA.³⁸ These figures include not just the carbon from burning oil, coal and gas directly and lifecycle emissions from nuclear power generation, but also the carbon 'embedded' in the products that we all buy and consume. These typically go uncounted and consequently underestimate the differences between rich and poor countries.³⁹

Even so, for all our claims to global leadership, Europe is less carbon efficient at delivering well-being to its own citizens today than it was over 40 years ago.⁴⁰ Comparing the quantity of fossil fuels used by the economy to deliver a given amount and quality of life, core European nations are less efficient today than they were in 1961.

Even so, energy consumption in China rose 70 per cent between 2000 and 2005, with use of the 'dirtier' fossil fuel, coal, going up even more, increasing by 75 per cent. Now, 80 per cent of China's electricity is generated from coal, from over 2,000 un-modernised power stations. To meet rapidly increasing electricity demand, in 2005 it was revealed that there are now plans to open at least 544 new coal-fired power stations – equivalent to the opening of one new power station every 10 days for the next 15 years.⁴¹ And, as we'll see below, when our major retailers scour the world for the cheapest production costs, the result is that more greenhouse gases get pumped into the atmosphere for every product we buy. That is what happens when things get made in places like China, compared to production in more energy efficient countries that use a cleaner fuel mix.

The carbon ship keeps coming in...

In the weeks before Christmas 2006 a cargo ship called the Emma Maersk, staggeringly huge at 400 metres long, made its maiden voyage from China to Felixstowe in Suffolk. On board, that single ship (and its owners plan to build another seven just like it) carried around 45,000 tonnes of stuff for people to buy and consume over the festive period.

In 2006, the UK imported almost half-a-million tonnes worth of children's toys and indoor games from China costing £1.25 billion (\$2.3 billion) (Figure 2). Of that, £142 million and 50 thousand tonnes alone were Christmas decorations. Around 70 per cent of all Christmas decoration imports are manufactured in China.⁴²

In total, the UK imported £15.6 billion worth of goods from China, an 18 per cent rise on the previous year. The major categories of things filling our homes and workplaces, apart from toys, were: sports and electrical goods, IT and telecommunications equipment, clothes, shoes, plastics, and furniture (Figures 3 and 4). But toys and electrical goods alone tell a story of how the UK hoovers in ever more products from China's factories (Figure 5).

Figure 2: Carbon not included: UK toy imports from China

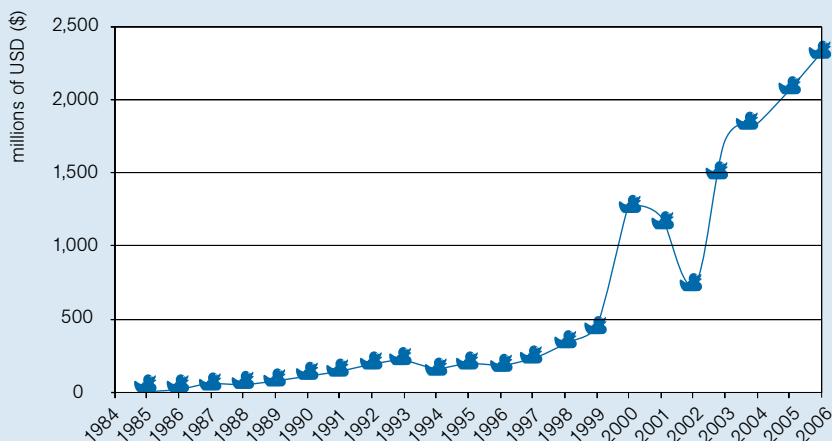


Figure 3: Top 10 imports from China to UK by value:
(46 per cent of total imports – the remainder is split between 233 other commodities)

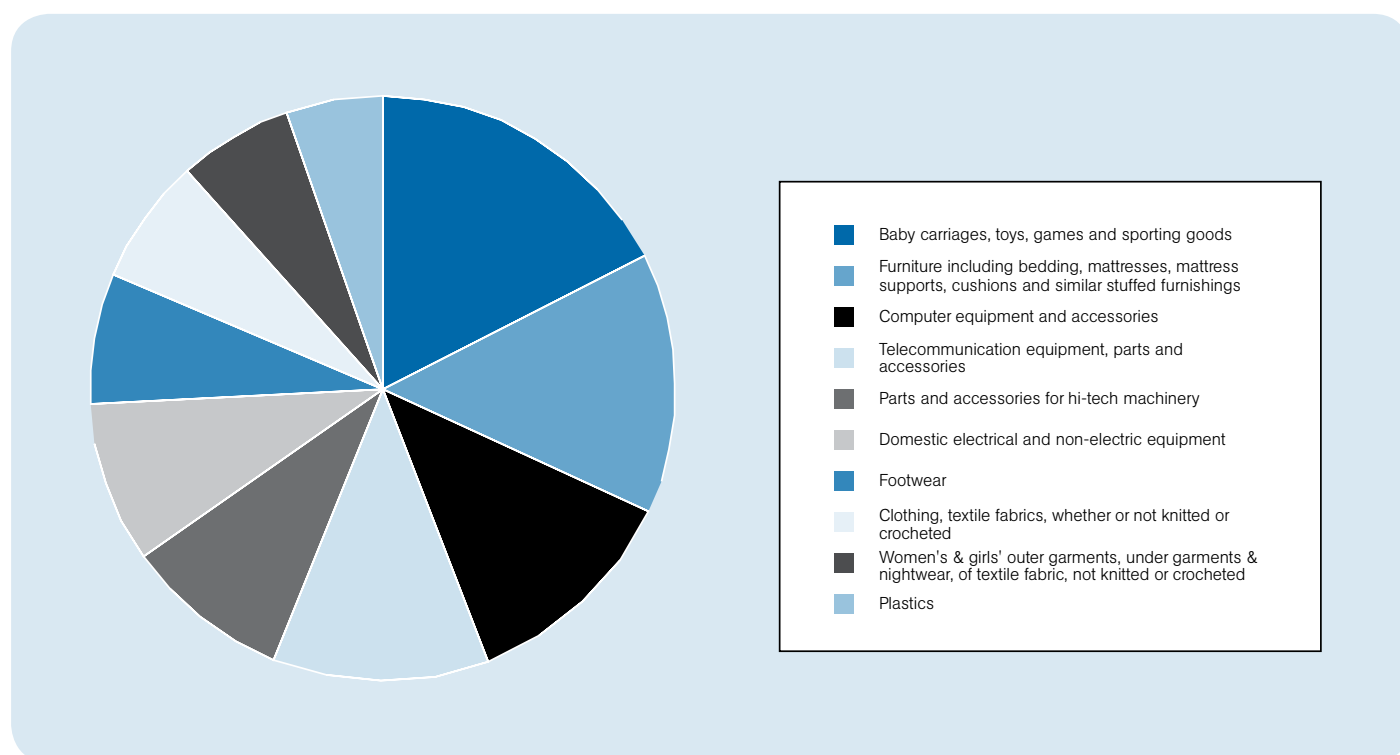
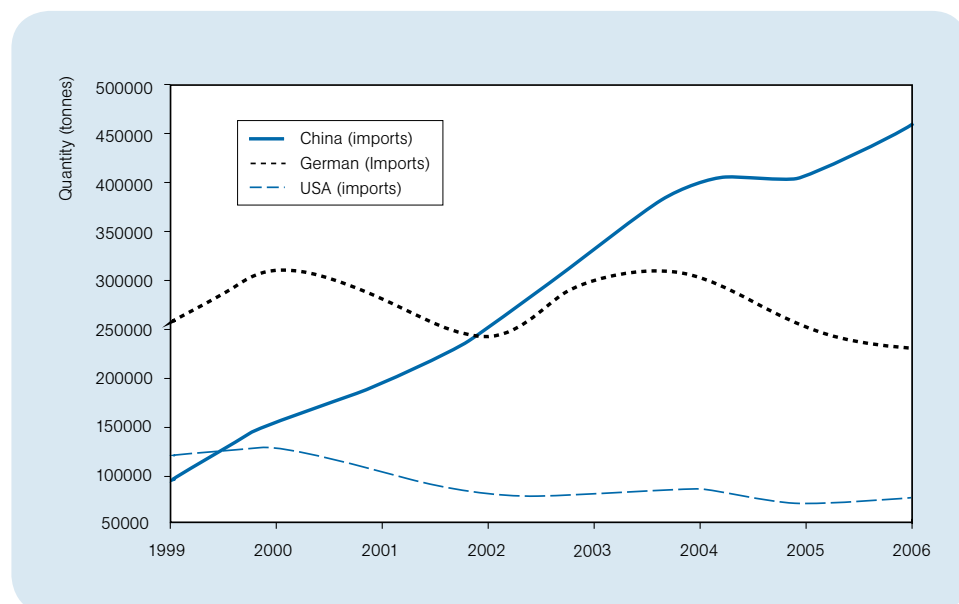


Figure 4: Top 10 imports from China by weight and value

		Billions of Pounds Sterling	Thousands of tonnes
Rank	Total imports in 2006	15.56	6426.86
1	Baby carriages, toys, games and sporting goods	1.26	378.82
2	Furniture including bedding, mattresses, mattress supports, cushions and similar stuffed furnishings	1.03	589.65
3	Computer equipment and accessories	0.89	31.81
4	Telecommunication equipment, parts and accessories (e.g. telephones, loudspeakers, TV and radio transmitters)	0.85	46.73
5	Parts and accessories for hi-tech machinery	0.65	23.31
6	Domestic electrical and non-electric equipment (e.g. microwaves, dishwashers, shaving equipment, and parts & accessories)	0.64	243.10
7	Footwear	0.53	107.87
8	Clothing, textile fabrics, whether or not knitted or crocheted	0.49	55.45
9	Women's & girls' outer garments, under garments & nightwear, of textile fabric, not knitted or crocheted	0.45	49.32
10	Plastics	0.39	266.37

Source: www.uktradeinfo.com (2006)

Figure 5: Electrical goods arriving in the UK from China, Germany and USA



Source: www.uktradeinfo.com (2006)

By sourcing ever-more of its consumer goods from China, Europe and the United States have not only 'out-sourced' their manufacturing, they are, in effect, using China as a 'carbon laundry' and increasing total greenhouse gas emissions into the bargain.

To understand the full environmental impact of manufacturing you have to look at the whole life-cycle. The carbon emissions and environmental impact of a product are strongly related to where it is produced. There are four key factors:

1. Differences in economic efficiency
2. Production methods
3. Environmental legislation
4. Energy sources.

As big retailers like Wal-Mart (Asda in the UK) and Tesco hunt for cheaper imports, it generally means a higher carbon footprint for that commodity. Table 2 shows in relative terms, how much carbon is in the energy mix of a range of countries and regions. A higher number means that for every unit of energy used – for whatever purpose – more carbon will enter the atmosphere.

Environmental Dominos

Considering its huge landmass, China possesses relatively few natural resources to supply its rapidly growing economy. As a result, it is already overshooting its available domestic biocapacity. So, to feed its export industries China has turned to finding natural resources from elsewhere.⁴³ The consequence is a double domino effect. First, as domestic resources are exhausted, pressure is exerted on the ecosystems of other developing countries to supply materials. Secondly, where resources like oil are concerned, there location in unstable and conflict prone areas means that environmental problems tip over into becoming major political ones. China's increasingly high profile in Africa is a result of China's search for resources including wood, oil and fish.⁴⁴

Per person, China's levels of fresh water; cultivated land, forest and grassland are well below the global average.⁴⁵ Domestic reserves of key mineral resources are likewise, well below the world average.⁴⁶ This means depending on more resource-rich nations for a increasing proportion of the raw materials and energy needed to fuel continued growth.

Table 2: Values of carbon intensity of primary energy

Country	Carbon intensity of energy ⁴⁷	
US	15.22	
Europe	14.04	
UK	14.93	
Japan	14.42	
China	20.45	(27% above UK)
India	18.66	(20% above UK)
World	15.67	

Source: EIA⁴⁸

Deforestation in Burma⁴⁹

Burma contains some 34 million hectares of natural forest – the second largest in South East Asia after Indonesia. In 2005, the international environmental watchdog group Global Witness reported that rampant deforestation was occurring in Burma's northern Kachin State, one of the World's forests with the richest biodiversity.

It's been driven by growing demand for timber from China fuelling illegal logging of Burmese timber. Further pressure is said to have been put on Kachin's forest as a consequence of ceasefire arrangements between the Burmese military government and local insurgent groups. Villagers in other parts Burma frequently report that unrestrained commercial logging in the past few years has dramatically altered their local forest area.

Scouring the world for resources, assets and technology, China's outward foreign direct investment grew by over 65 per cent annually between 2000 and 2005.⁵⁰ Worth around \$12.3 billion overseas in 2005, it is projected to stand at around \$60 billion by 2010.⁵¹ China's search for oil, for example, has been criticized for disregarding human rights issues, particularly in Sudan.⁵² Just as the UK's energy independence is rapidly decreasing, China is also becoming increasingly dependent on foreign imports of energy, particularly oil. China became a net importer of oil in 1993, and it is now the world's fastest growing importer. Imports are 40 per cent of its total requirement are projected to grow to 70 per cent by 2020.⁵³ But, many of the oil fields in more politically stable regions are showing strong signs of declining production. At a time of significant competition for conventional oil (and gas) reserves, interest in oil in unstable and conflict ridden regions, such as parts of Africa, will only increase.

The second-largest category of imports from China into the UK includes furniture. Because China has been seriously implicated in the illegal international timber trade it means we, too, are caught in the slipstream of a trade that has local environmental and economic impacts, but is also a serious contributor to global warming. Estimates by monitoring group GlobalTimber.org.uk suggest that China is both the source and conduit for significant volumes and value of illegal timber entering the UK (Figure 6) Given the difficulty of gaining data on illegal trade, these are indicative estimates intended to quantify the 'order of magnitude of illegal wood-based product trade to and from China'. Timber, furniture and wood stemming

Figure 6: China – estimated illegal imports and exports of wood-based products (2006)
(Adapted from the original: www.globaltimber.org.uk)⁵⁴

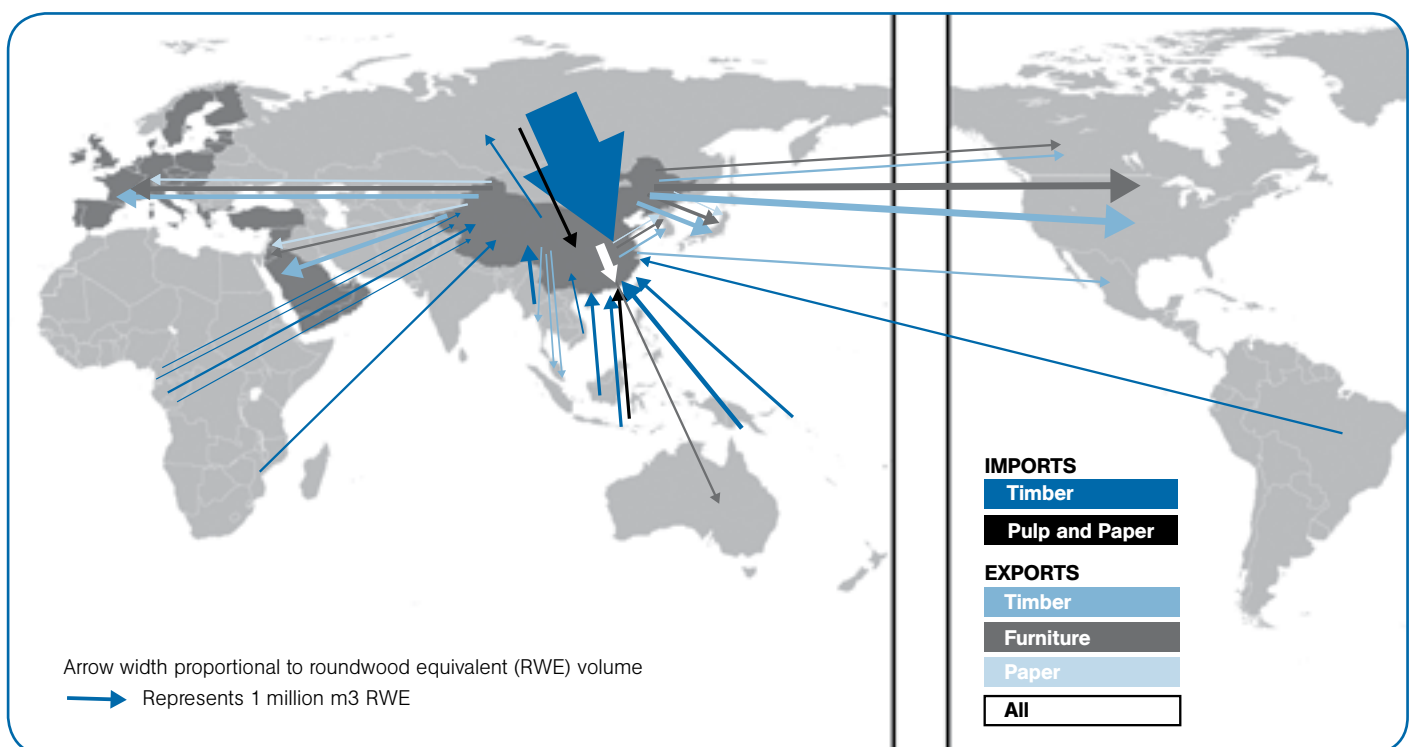
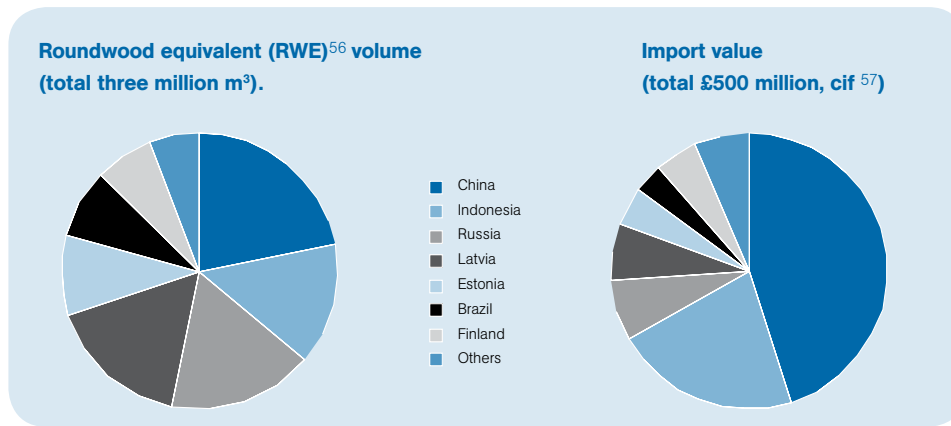


Figure 7: Estimated illegal timber imports to the UK by supplying country (2005)⁵⁵



Source: www.globaltimber.org.uk

from this trade all find their way to the EU. Nearly half of the estimated £500 million worth of illegal timber entering the UK is thought to come from China (Figure 7).⁵⁸

Carbon dioxide emissions from internationally traded goods can be thought of in two ways – from the perspective of the producer or from that of the consumer. In the current regime monitoring global climate change, all responsibility is placed on the producer. But, if the demand that drives greenhouse gas emissions comes from elsewhere, this is simply unfair, it is the end-consumer who should take the majority of the burden. Carbon and ecological footprinting methods adjust for this imbalance.

However, China's economic model of becoming the factory to the world has created extensive environmental problems. The nation faces the consequences of severe degradation at both local and global levels. Some is already irreversible and accompanied by significant impacts on human health.

Apart from the major greenhouse gas emissions, China is now the biggest source of sulphur dioxide in the world. Measurements of water quality by SEPA (the State Environmental Protection Administration) and the Ministry of Water Resources at over 2,500 monitoring sites spanning China's seven main river basins showed that over five years from 2001, more than half of the sites contained water deemed unsafe for human consumption, a 12 per cent increase in contamination since 1990.⁵⁹ And, 90 per cent of the lengths of rivers around urban areas were seriously polluted.⁶⁰

When officially published in 2007, a World Bank report suggested that pollution in China kills around 500,000 people per year. The *Financial Times* then revealed that this figure had been downplayed as a result of political pressure. In fact, the original estimate suggested that 750,000 people were dying prematurely each year, mostly due to filthy air and water.⁶¹

The many costs of low prices

Domestic environmental impacts have recently been accompanied by a global crisis of consumer confidence in products ranging from toys to food. Long supply chains involving complex outsourcing and many subsidiaries have resulted in a production process that is often difficult to monitor, and rests on poorly paid workers. While the Chinese central government has improved its environmental legislation, implementation is another matter at the level of regional and local government. Pressures over cost and competitiveness have led to a series of scandals that have tainted China's reputation for laying the road to product heaven for the world's rich consumers.

A series of mysterious cat and dog deaths in the USA grabbed the nation's attention. It was later attributed to pet food from China contaminated with melamine. The contamination was traced to two Chinese manufacturers who added the

chemical to wheat and rice products to make them appear protein-rich. Melamine is a chemical used to make plastics and sterilise swimming pools.⁶² Also, millions of tubes of Chinese-made toothpaste, which allegedly contained dangerous levels of the toxin diethylene glycol, a chemical often used in dyes and vehicle brake fluid, were recalled.⁶³ Later on in the year, over one million children's toys made in China had to be recalled after they were found to be coated with poisonous lead paint.⁶⁴ Elsewhere, reportedly: party planning became difficult after fireworks had to be recalled because of their dangerously unpredictable sense of direction, European custom officers seized fake birth control pills and HIV drugs from China, and fake antibiotics on the Chinese market also reportedly led to a number of deaths.⁶⁵

Beyond specific examples of the manufacture of potentially lethal fake products, counterfeiting generally is a much more ambiguous issue. Various writers have pointed out that in Europe and the USA, during their rapid phases of economic development, little respect was afforded to the intellectual property of foreign countries and their manufacturers.⁶⁶ For centuries, production processes for ceramics were far more advanced in China than Britain, and it is from there that British potters copied techniques later used profitably in Britain's expanding domestic ceramic industry. There is a reason that the collective noun we use to describe bowls and plates is 'china'.

Contemporary approaches to guarding technological innovations are restrictive and enforced by international law. This makes improving the environmental performance of industry in developing countries more difficult. In spite of many promises to the contrary, the track record of rich countries transferring technology has been poor.

For example, the Chinese National Climate Change Programme urged developed nations to 'eliminate obstacles to technology cooperation and transfer.'⁶⁷ Ma Kai -minister of the National Development and Reform Commission, said that in the context of technology transfer developed nations have 'said a lot, but done little'.⁶⁸

Three types of technology that developed nations are reluctant to transfer include: first, and perhaps obviously, those with potentially military application; second, those that give a strong industrial competitive edge; and finally those that are related to resources and energy control. Yet, the last two are crucial for economic development and environmental performance.⁶⁹ US high-tech exports to China were reduced by 10 per cent in 2006 compared to 2001. Yet, the USA's economic fear of China is loaded with irony. In 2001, the USA imported \$51.1 million worth of 'stars and stripes' flags, mostly from China. Since then the state of Minnesota banned the flying of an American flag unless made in the USA. Violations of the law will be punished by a \$1,000 (£495) fine or 90 days in jail.⁷⁰

Trends in UK interdependence

The first *UK Interdependence Report* published by **nef** in 2006 presented a picture of the flow of culture, skills and natural resources between the UK and the rest of the world. It showed how, if left to survive purely on our own domestic assets, life would look very different.

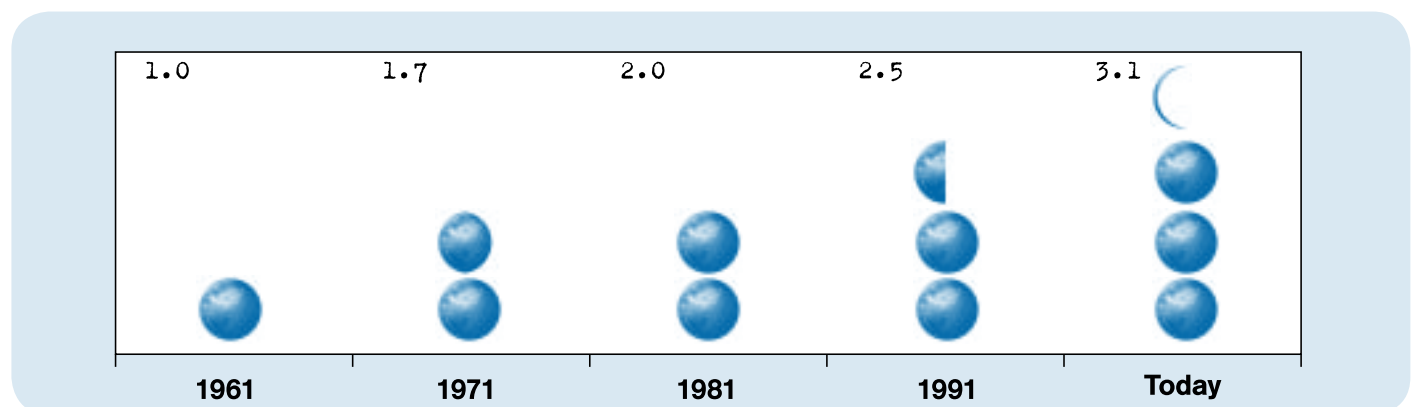
As the nation becomes ever more reliant on importing food, our tables would be empty of many things that we take for granted. Our schools would miss teachers and our hospitals would be critically short of doctors and nurses. Now a net energy importer, without radical redesign of how we produce, distribute and use power we'd be faced with a massive involuntary switch-off and power-down. Restaurants would be less interesting; film, television and literature less creative and diverse; and football teams less exciting to watch.

The report revealed that there are huge gains to be had from an open world in which people are able to cross borders and culture can flow freely from one nation to another. But it also revealed a huge problem. Our levels of consumption were demonstrated to be far too high to be environmentally sustainable. It was the case both here in the UK over the long term and even more so if exported as a model of how to live to the world's majority.

It showed a country living well-beyond its environmental means, setting an example to the rest of the world that seemed to treat the planet and its biocapacity as if it were a business in liquidation.

In this follow-up, we return to a number of the key themes to see what has happened to those trends. We focus on those things which are fundamental to everybody's way of life – food, energy, and skills for vital services like health. We also revisit one of the key contributors to the footprint that our lifestyles leave on the planet – consumption based on ecologically wasteful trade.

Figure 7: The UK's growing ecological footprint: number of planets needed to support the whole world at UK levels of consumption



The nation's high-consuming lifestyles are only possible because the rest of the world supports us with large supplies of their natural resources. The way we live also sets a model of materialism that many people in much poorer countries understandably seek to emulate. Forty years ago, if the whole world wanted to copy the UK, the Earth could just have supported the demand on its ecosystems. But the UK's consumption levels have risen steadily. Today, if everyone consumed as much as the average UK citizen, we would need more than three planets like Earth to support them. To live within our overall environmental means, and give people around the world a chance to meet their needs, means the UK will have to reduce the burden its lifestyles create.

In the year and half since the first report, public awareness of climate change has increased enormously. It is one of the most visible consequences of our inability to live within our environmental budget. Yet, as the following pages show, awareness of the problem is yet to translate into new patterns of behaviour that will be part of the solution. Our dependence on the ecosystems and natural resources of the rest of the world is growing, not shrinking. In the process we take up environmental space that is needed much more by the populations of poorer countries, where a range of basic needs go unmet. We also leave our nation vulnerable.

There are two major reasons why greater dependence on the rest of the world for food and energy leaves us increasingly insecure. Climate change will have a large and unpredictable effect on the world's ability to grow food. In such a situation, higher international dependence means higher insecurity. Secondly, rising worldwide demand and competition for ultimately shrinking fossil fuel supplies will at best leave us vulnerable to drastically rising prices, and at worst set us up for an energy crash. We can, of course, choose to change direction. After all, in societies like the UK which are already wealthy, lifestyles based on over-consumption do not raise well-being.

This has been true for several decades. Today, if carefully planned, we can lower the amount we consume and *increase* our life satisfaction. We can increase our self reliance for those things which are crucial to meeting our basic needs. And we can plan to have a pattern of interdependence with the rest of the world which is positive and progressive, not demanding and destructive.

On an island planet with an increasingly stressed human life-support system, we have to learn to live and play together nicely. If we don't, there is nowhere else to run.

Cultural and human flows

Life in the UK is enormously enriched by culture flowing across our border. Food, cuisine, literature, film and sport with an international flavour make life more interesting. We can even appreciate more, by contrast, our own distinctive national, regional and local offerings. Yet ask any football fan, and you'll quickly realise that even these manifestations of globalisation are not trouble free.

Weekly laments during the football season follow teams made up either all or mostly of international players. Top clubs increasingly owned and operated as the playthings of multi-millionaires buy players from around the world at astonishing prices and the cry goes up that we are neglecting to develop our domestic talent.

In response to such concerns, in July 2007, the European Commission proposed a quota system for 'home-grown' players.⁷¹ According to press reports, in August 2007 of 143 new signings by clubs that occurred over the summer, only 40 were English. At the start of the new football season over 60 per cent of players making up the Premier League cannot play for England, and 56 per cent come from outside of the UK.

Blackburn has players from 20 different countries, ranging from the Faroe Islands, the Congo and Paraguay to Grenada, the Netherlands and South Africa – making it the most multinational team in the League. Sixty-eight different countries are now represented in the Premier League as a whole.⁷² When it began in 1992, there were approximately 12 foreign players in the premier league. Now, reportedly, there are over 350.

Compared to our last report, the number of films and television programmes of foreign origin imported into the UK has risen.⁷³ As an overall industry, tourism represents a net loss to the UK economy. The key measures used in the sector are the number of nights a tourist spends in a place and the estimated amount they spend. In 2005, tourists coming to the UK spent a total of 249.2 million nights here, spending £14.25 billion. But, outbound tourists from the UK stayed away for a total of 669 million nights of stay, spending £32.2 billion.⁷⁴

Human movements

In the last report we pointed out that in direct contradiction to the popular myth of the UK being a soft-touch for 'health tourists', the UK's health service increasingly relies on attracting a growing number of health professionals from around the world.

Trained at public expense in their countries of origin, many of these come from very poor countries whose own health services can ill afford to lose them. Malawi, Botswana and Zambia were all countries that can ill-afford to lose professionals trained with scarce indigenous resources to wealthy countries like the UK.

More broadly across the economy, new research from both employers' organisations like the CBI, and union bodies like the TUC,⁷⁵ consistently praises the contribution of legal, migrant workers who actually boost the economy, rather than being a drain on public resources. There have also been moves to protect workers in unskilled jobs that are typically filled by migrant labour. Picking crops of fruit and vegetables and toiling in the pack houses that serve our dominant supermarkets, these workers have often been especially vulnerable to exploitation. A new law that licences the 'gangmasters' who control much of this migrant labour force has been introduced. Abuses do, however, continue. In summer 2007 the Gangmaster Licensing Authority revoked the license of a gangmaster whose workers were helping to supply vegetables to leading UK supermarkets Tesco and Morrisons.⁷⁶

Recruitment and migration in health and education

'The loss of human resources through migration of professional health staff to developed countries usually results in a loss of capacity of health systems in developing countries to deliver health care equitably. Migration of health workers also undermines the ability of countries to meet global, regional and national commitments, such as the health-related United Nations Millennium Development Goals, and even their own development. Data on the extent and the impact of such migration are patchy and often anecdotal and fail to shed light on the causes, such as high unemployment rates, poor working conditions and low salaries.'

World Health Organization 2004⁷⁷

There is a shortage of healthcare professionals in the NHS for a number of reasons. For example, there is increasing demand for health services due to ageing populations, chronic cases requiring longer treatment and care, unattractive working conditions in the sector (long working hours, shift work, workplace violence), and low wages. This shortage is being increasingly filled with migrant workers.

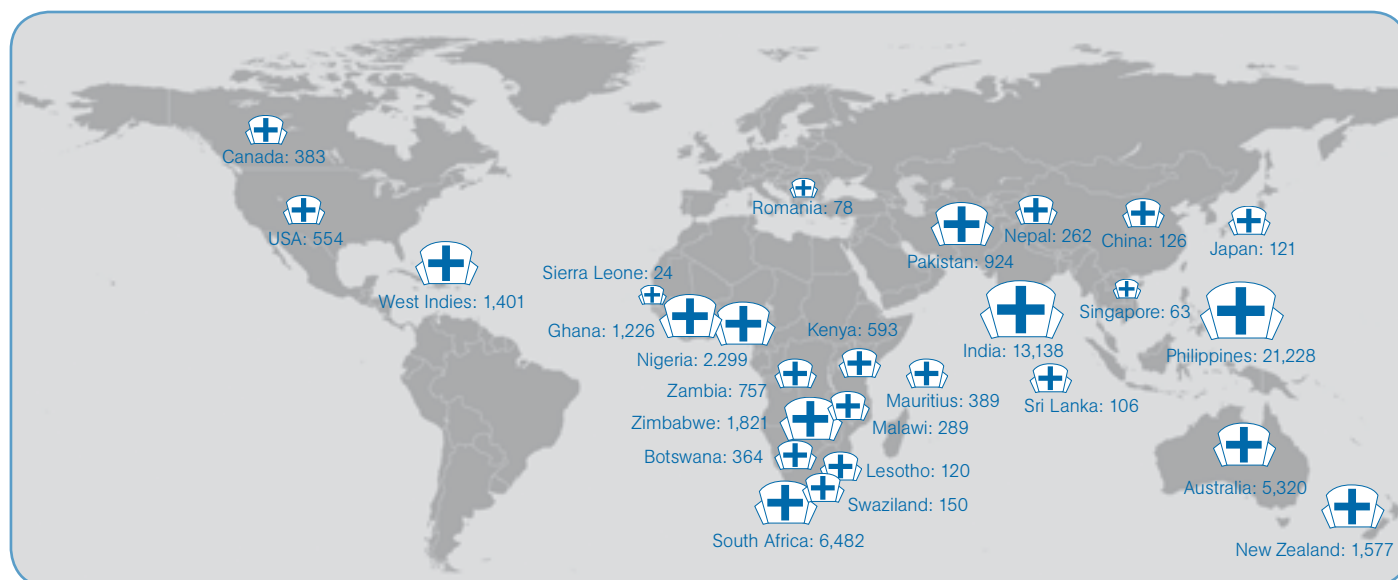
But significant migration of healthcare professionals away from developing countries can undermine their domestic health services – leading to the phenomena known by academics as 'maladaptation'. Paradoxically, the 'push' factors that lead to migration, for example, weak and under-funded domestic health services workers, tend to be the very reasons why they should stay.

The movement of healthcare professionals, including both temporary and permanent migration, is cause for concern for the nations supplying the workers.⁷⁸ This is especially true in a world experiencing global warming, where the worst impacts are set to fall on the poorest countries such as those in Africa, and when the wealthier countries can always afford to pay their health professionals more.

The World Health Organization (WHO) has long recognised that the migration of healthcare professionals from developing to developed nations results in an asymmetry in the global healthcare workforce.⁷⁹ A 1998 United Nations Conference on Trade and Development/WHO study estimated that 56 per cent of all migrating physicians flow from developing countries to industrialised countries, while only 11 per cent migrate in the opposite direction – a five-fold difference; the imbalance was even greater for nurses.

Although the UK has attempted to take into account global equity issues by adopting a formal 'code of practice' prohibiting the NHS from recruiting healthcare professionals from a specified list of developing nations including in particular many African nations,⁸⁰ the code has not resulted in a reduction in nurse recruitment. Significant numbers of African nurses are still coming to the UK, entering the health system through private-sector recruitment and often going on to get jobs in the NHS.⁸¹

Figure 8: Admissions to the UK nursing register in the last five years



Source: The Nursing and Midwifery Council, 2007

The NHS has a specific recruitment programme to identify healthcare professionals who are interested in migrating to the UK. While physicians are usually recruited on an individual basis, nurses tend to be recruited in groups of ten to twenty or more from a specific country.⁸² But even where physicians are concerned, although the number migrating to the UK declined between 1997 and 2003, it is now on the rise.⁸³ The most prominent source countries for health personnel are India, the Philippines, and South Africa, whose nurses, physicians and technicians emigrate to Australia, the Eastern Mediterranean, the UK, and the USA. Since our last report, the percentage of the total number of physicians registered to practice in the UK who come from South Asia has risen from 11.5 per cent in 2004 to 16 per cent in 2006. The number of doctors registered from sub-Saharan Africa has risen by 3,791 since 2004.⁸⁴ According to one study, over a period of 35 years, nearly half of South African medical graduates emigrated. Most ended up in the USA or other commonwealth countries whilst only one in twenty ended up elsewhere in Africa.⁸⁵

The latest data reveal that in the last five years alone, the UK has imported 289 trained nurses from Malawi, 364 from Botswana and 757 from Zambia. South Africa, Ghana, Lesotho and Zimbabwe also send nurses trained in the health systems of Africa to work in the NHS. India recently overtook the Philippines as the largest source country with 3,551 nurses arriving in 2006/6 compared with 1,541 from the Philippines (Figure 8).

Since 1997 over 90,000 international nurses have registered in the UK, representing around four out of every ten of all first-time registrations. This pattern of recruitment has been part of a deliberate policy to solve nursing shortages in NHS hospital care and independent nursing homes.⁸⁶

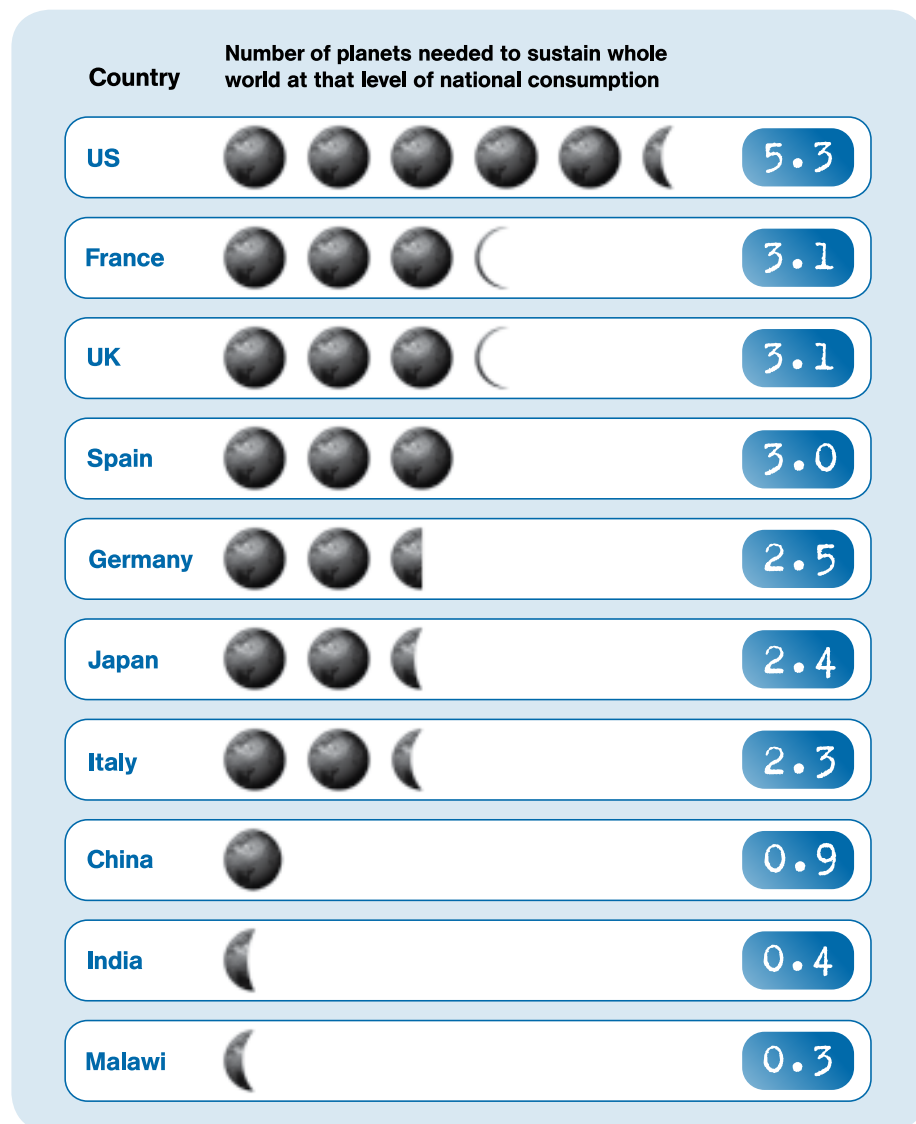
An apparent recent dip in recruitment from overseas, may however be only a temporary consequence of new registration procedures creating a 'backlog' of applications. All new non EU nursing applicants are now required to complete a 20-day Overseas Nurses Programme (ONP). Introduced in September 2005, the ONP has reportedly left many stuck in the recruitment pipeline.⁸⁷

Table 3: Work permits and first permissions approved by industry for 1995, 2000–2005

Absolute	1995	2000	2001	2002	2003	2004	2005
Education and cultural activities	1,901	3,832	8,003	8,142	6,603	6,187	6,404
Health and medical services	1,774	14,516	20,592	22,271	24,621	26,568	22,477

Source: Office for National Statistics (2006)⁸⁸

Table 4: Number of planets needed to sustain whole world at that level of national consumption (2006)



Source: Global Footprint Network, 2006 National Footprint Accounts. NB: This is a highly conservative assessment assuming that all bio-capacity is available for human use.

Natural resources flows: energy, trade and food

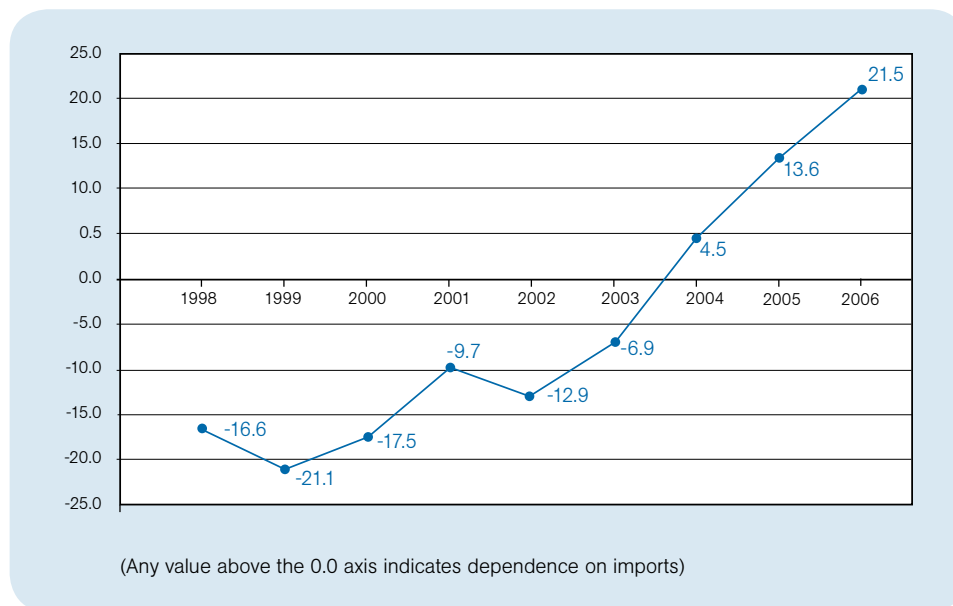
Energy

The UK's ability to meet its domestic demand for energy from domestic resources continues on a downward trend. In spite of huge untapped renewable energy sources, due to the UK's continuing dependence on fossil fuels, rising demand, and inefficient supply, since 2004 the nation has lost its energy independence and is heading further in the wrong direction. We now increasingly rely on imports to balance supply and demand.

The 'energy dependence' factor is the ratio of net energy imports to demand multiplied by 100 to produce a scaleable figure. When it becomes 'positive,' it means that we are obliged to import energy to meet our demand – in other words, our independence declines. The factor when the UK recently lost its 'independence' in 2004 was 4.5. In 2005 it rose to 13.6, and went up again to 21.5 in 2006 – a 60 per cent increase in the dependence factor in one year and almost four fold since 2004.

Our energy security is vulnerable to the frequently hostile global geopolitics of energy. A high and volatile oil price on the global market is a major threat to a country like the UK, whose transport, food system, and much of its economy depends on oil and petroleum products. But the loss of control over supplies is also a threat to our sovereignty.

Figure 9: Energy interdependence: How the UK increasingly relies on imported energy to meet its needs.



Source: nef estimates based on DBERR 2006, "Digest of UK Energy Statistics" (DUKES).⁸⁹

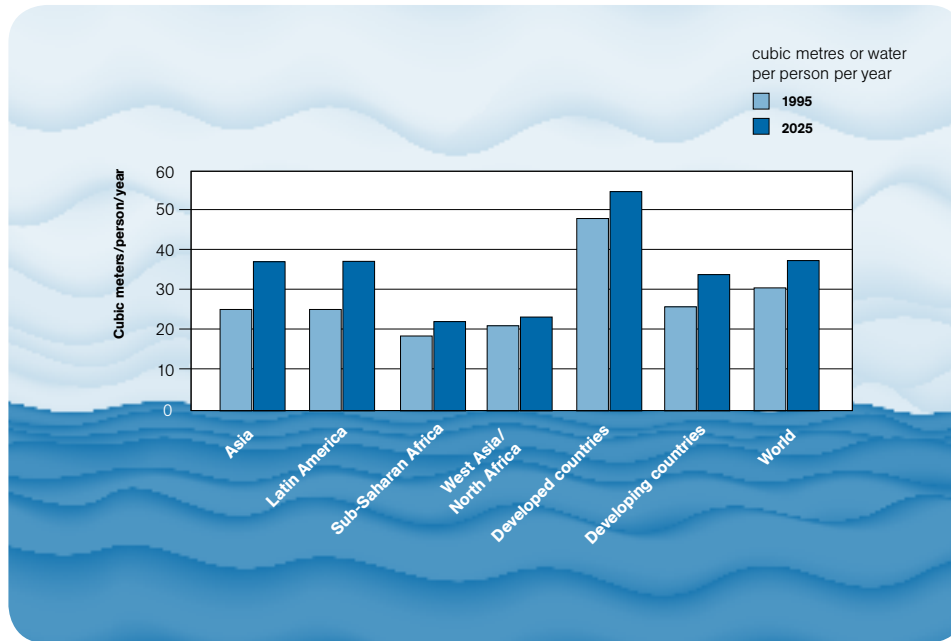
The re-emergence of 'resource nationalism' has been another political feature of the last few years. Recent examples include where governments impose tougher terms on independent oil companies, such as when Russia forced Shell and BP to hand over control of the Sakhalin-2 and Kovykta gas schemes, and when ConocoPhillips was, in effect made to leave Venezuela.

The liquid gold rush

Some of the seemingly obvious alternative paths to reduce both our overall dependence on fossil fuels, and our dependence on fuel coming from other countries are, on closer inspection, not obviously beneficial at all.

For example, the rise in popularity of biofuels is creating competition for land and water between crops grown for food, and those grown to make biofuels. So-called 'Tortilla Riots' in Mexico in 2007 followed the rise in price of corn as more land was given over for biofuel production.⁹⁰ In terms of climate change, new calculations looking at the full lifecycle of palm oil production concluded that, under a range of fairly typical circumstances, vastly more carbon was released into the atmosphere as a result of growing palm oil, than results from burning fossil fuels. Research published earlier in 2007 showed that the growth of palm oil for biodiesel for the European market is now the main cause of deforestation in Indonesia.⁹¹ It is likely soon also to be responsible for the extinction of the orang-utan in the wild. Because of deforestation and drainage of peat-lands to grow the crop, every tonne of palm oil created in South East Asia resulted in up to 33 tonnes of carbon dioxide emissions – ten times as much as conventional petroleum. In 2006, the UK imported 1.6 million tonnes of palm oil and palm kernel oil, 676,972 tonnes of which was imported from South East Asia.⁹² Separately, an estimate by a coalition of aid and environment groups including Greenpeace, Oxfam, the RSPB, WWF and Friends of the Earth, suggests that the process of soya for biodiesel grown on deforested land would take 200 years before it could be considered carbon neutral.⁹³

Figure 10: Global water outlook until 2025.



Source: International Food Policy Research Institute (2002)⁹⁴

Water vs Fuel

In a world faced with increasing drought problems, another less visible issue, is how thirsty biofuel crops are. Currently biofuels only account for two per cent of 1,200 billion litres of petrol and diesel (in energy equivalents), but this is expected to expand rapidly – global biofuel use doubled between 1990 and 2003 and is projected to double again by 2010.⁹⁵

A recent study estimated that a global average of between 1,000 and 3,500 litres of water is consumed by the biomass needed to produce one litre of biofuel.⁹⁶ To put this in context, the amount of water required to provide enough bioethanol for the average annual fuel consumption of a UK vehicle (1,363 litres),⁹⁷ could be around 1,363–4,800 m³ of water, or between 17,000 and 60,000 baths full of water. Where the higher estimate is concerned, *this is over twice the number of baths the average person has in a lifetime.*⁹⁸ The notion of 'embedded carbon' is more widely understood. But, in terms of our full ecological footprint, we must increasingly be conscious of precious water supplies 'embedded' in the things we consume.

Figure 10 shows water consumption in 1995 (light blue) and projected water consumption in 2025 (dark blue) per person in different regions in the world. These estimates sit against other dramatic projections by the UK's Hadley Centre for climate prediction and research, part of the UK government's Met Office, that suggest that nearly one third of the earth's land surface could become prone to 'extreme' drought by the end of the century. Currently only three per cent of land falls into that category.⁹⁹ Developed countries already consume the largest volume of water per capita. In fact, the UK consumes the most water in Europe, now using around 133 m³, or over 1,500 baths of water each year. Each individual in the UK consumes around 363 litres of water per day. Despite the high levels of water consumption, the average household in the UK still consumes less water per annum than the corn required to produce the bioethanol to fuel their family car. The freshwater required to irrigate corn to fuel the average private vehicle in the UK could provide the annual volume of drinking water for between 55 and 220 people living in Asia.

How low can we go? A road map to 80 per cent cuts in UK carbon emissions by 2050

The UK takes up far more than a fair and safe share of global greenhouse gas emissions would allow. As a consequence, it deprives people in developing countries of the environmental space they need to develop economically. Based in poorer countries, 80 per cent of the world's population is responsible for only 23 per cent of the total carbon dioxide emitted since the industrial revolution. With the UK's global interdependence comes responsibility. Industrialised nations need to achieve a carbon footprint small enough to prevent the planet warming by more than two degrees above pre-industrial levels. But is it really possible for countries to meet energy needs from renewable resources and significantly reduce emissions?

In fact, with the right mix of renewable energy and energy efficiency it is relatively straightforward. There is a road map that could deliver the reductions in emissions of 70–80 per cent that Sir Nicholas Stern, author of the Treasury's influential report on the economics of climate change, believes industrialised nations need to make by 2050. Only the political will is lacking. In August 2007, an internal Department for Business, Enterprise and Regulatory Reform document revealed the great lengths to which senior UK government officials were prepared to go to evade the EU target of 20 per cent renewable energy by 2020. Statistics on the UK's current energy mix show why officials may have sought to wriggle out of the UK's commitments. Currently, only two per cent of our overall energy comes from renewable resources (the figure is four per cent for electricity), with eight per cent from nuclear and the remaining 90 per cent from fossil fuels. We are, it seems, still overwhelmingly hooked on carbon. So how do we break the fossil-fuel habit?

Energy independence, or 'security' is likely to be as strong a motive as climate change. Between 2004 and 2006, the UK's energy dependence on other countries rose four fold (Figure 9). The imminent threat of peak oil¹⁰⁰ and the need to maintain a secure, reliable energy supply, means political action here is just as urgent as that taken to prop-up the UK banking system in September 2007.

Kicking the carbon habit: a framework for 80 per cent reduction in fossil fuel use by 2050

Craig Simmons specialises in the science of ecological footprinting. He has devised a framework for reducing fossil-fuel use and carbon dioxide emissions by 80 per cent by 2050. This break with our fossil-fuelled past would be achieved by a 70 per cent reduction in fossil fuel use, combined with a 10 per cent reduction in demand from improved conversion and efficiency of distribution. Together this would reduce annual carbon dioxide emissions per capita from 10 tonnes today, to just 2.1 tonnes by 2050.

1. Balancing the books

To meet all of the UK's current energy needs we need to generate around 2,000 Terra-Watt hours of energy per year (TWh/yr). To put this into perspective, this is enough energy to power a 100W light bulb for almost 2.3 billion years. Achieving an 80 per cent cut by 2050 means reducing the contribution of fossil fuels and nuclear – currently 98 per cent of the total – by almost one-fifth, to a tiny 400TWh/year. Coupled with a 1.7 per cent reduction in energy use each year, the UK could run largely on renewables by 2050.

2. Taking stock and making use of untapped resources

i. Harnessing the UK's renewable energy

The UK is an island with some of the strongest tidal regimes in the world. There is clearly an enormous potential for all tidal, wave and wind energy. Theoretically, the UK could generate more electricity than it needs through onshore and offshore wind, wave and tidal power. Investment in wind, wave and tidal power could be generously supplemented with:

- Biomass (wood fuel, waste vegetable oil, crop residues and other energy crops) which could provide up to 10 per cent of the total.
- Micro renewables (wind, solar and hydro), providing up to 30 per cent of the total.
- Waste (landfill gas, animal and plant wastes). Animal wastes alone could generate around 10TWh/yr, enough to power the entire British agricultural sector.

ii. Using the Fifth Fuel

Energy efficiency is often described as the 'fifth fuel,'¹⁰¹ and is central to creating a renewables-based economy. But increased efficiency must be combined with an aggressive policy on reducing energy demand, otherwise

any gains from increased efficiency can be lost as levels of consumption increase. Improvements in energy efficiency, particularly in the domestic sector, have rarely been accompanied by absolute reductions in energy consumption. This will have to change. For example, government could place a 'demand reduction obligation' on energy suppliers.

Our centralised energy infrastructure is also extremely inefficient needs addressing as part of the transition towards a low carbon economy. A Greenpeace report estimated that up to two-thirds of potential energy is wasted as a result of inefficiencies.¹⁰² Not including energy lost from converting heat energy to electricity – which is at best 50 per cent efficient – a further five to seven per cent is lost through transmitting electricity over cabling and through substations. Some large-scale renewable resources lend themselves to a centralised system, such as hydroelectric power and its pumped storage facilities, or offshore wind farms. But, the large majority of renewables function far more efficiently and practically if they are integrated by a decentralised energy system where power is generated at, or near to the point of use. Transmission losses are then minimal; they can be easily synchronised with the national grid and respond to demand so that the energy generated is more effectively used.

3. Balancing our energy budget

Historically, in times of scarcity, resources have been allocated or rationed according to national, sectoral and individual needs. To live within a financial budget it is second nature to manage our funds or face the consequences. We allocate accordingly to meet our needs. The same logic applies even more stringently to our use of natural resources. You can extend a financial budget by going into debt, but go overdraw from an ecosystem and it may collapse, taking your life-support system with it. This is how a national energy budget could look according to the plan:

National allocations:

- Industry gets 40 per cent of all renewable grid electricity (large scale sources, such as offshore wind, tidal, and large-scale hydro).
- Transport gets 40 per cent of all large scale renewable grid resources, 48 per cent of all available fossil fuels and all available biofuels (waste vegetable oil and domestically sourced biodiesel/bioethanol).
- Agriculture gets the remaining 20 per cent of renewable grid electricity, six per cent of fossil fuels all animal wastes and 50 per cent of PV supply.
- Domestic uses receive all of the micro-wind, 50 per cent of the solar supply, six per cent of the fossil fuels and all the remaining biomass.
- Non-energy: 35 per cent of the fossil fuels are allocated to non-energy uses (chemicals, lubricants, plastics and so on).

Personal and household targets:

- 600 oven dried kilogrammes of biomass per capita.
- 1,400kWh/yr of electricity per capita or 3,100kWh/yr per household.
- Fossil fuels allocated to the domestic sector (around 2,300kWh per capita) are set aside for historic buildings and hard-to-heat homes that cannot be quickly or simply upgraded.
- While 80 per cent of transport fuels get allocated for essential freight and public transport, the remainder will be available for private vehicle use. Given this, the energy allocation for personal transport would be equivalent to around 300 litres of diesel per household – enough for each person to travel solo for 4,400 kilometres or 85 kilometres per week.

The potential that the UK has to achieve these significant but vital cuts was recently set out by the Liberal Democrats in the report, *Zero Carbon Britain – taking a global lead* in August 2007. Acknowledging that current targets of reducing greenhouse gas emissions to 60 per cent below 1990 levels would not be sufficient to avert the impending climate crises should we exceed a global average temperature rise of 2°C, *Zero Carbon Britain* sets out an ambitious policy framework for sourcing 100 per cent of the UK's energy from renewable sources by 2050.

Sources: Dunster B, Simmons C, Gilbert B (2007) *The Zed Book* (Abingdon, UK: Taylor & Francis ; a summary of Best Foot Forward's plan for achieving 80% cuts in UK carbon emissions by 2050.)¹⁰³

Trade

In line with much of the rest of the world, international trade, also largely reliant on fossil fuels, is an increasingly important part of the UK economy. As a share of the nation's GDP, trade is now at a decades-long high (Figure 11b).

Yet, just as the rise and rise of trade illustrates our growing global interdependence, so it reveals creeping insecurities. The picture of UK food supplies mirrors the situation with energy, and in it our rising dependence on the rest of the world. The UK's relative self reliance is in decline.

Much trade is also ecologically wasteful, and sometimes to a bizarre degree. Against a background of rising oil prices and pressure to reduce greenhouse gas emissions, numerous examples of trade appear highly inefficient. Identical and virtually identical products are being shipped, trucked and flown backwards and forwards, incurring heavy environmental costs, as the randomly selected examples in Table 6 show.

Figure 11a: UK dependence on trade in global comparison

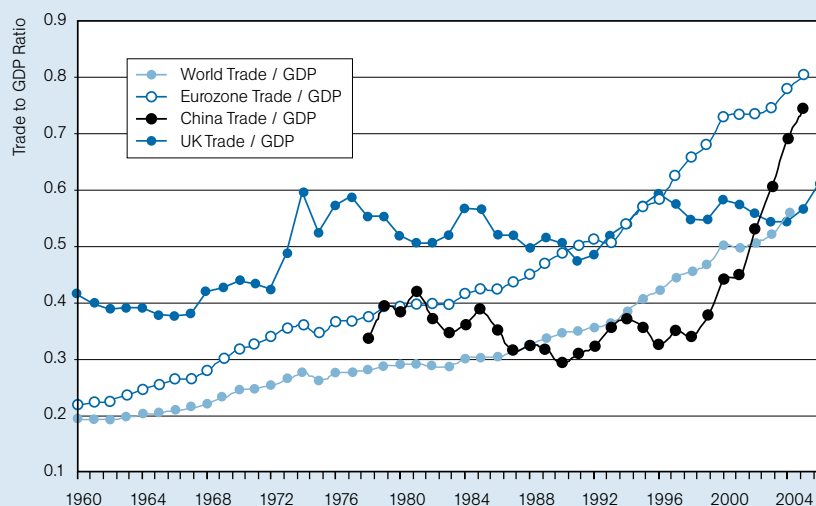
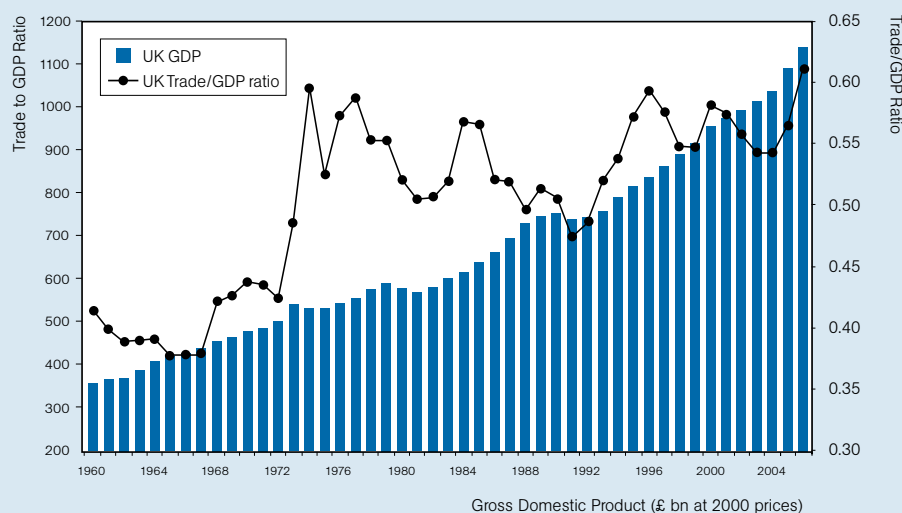
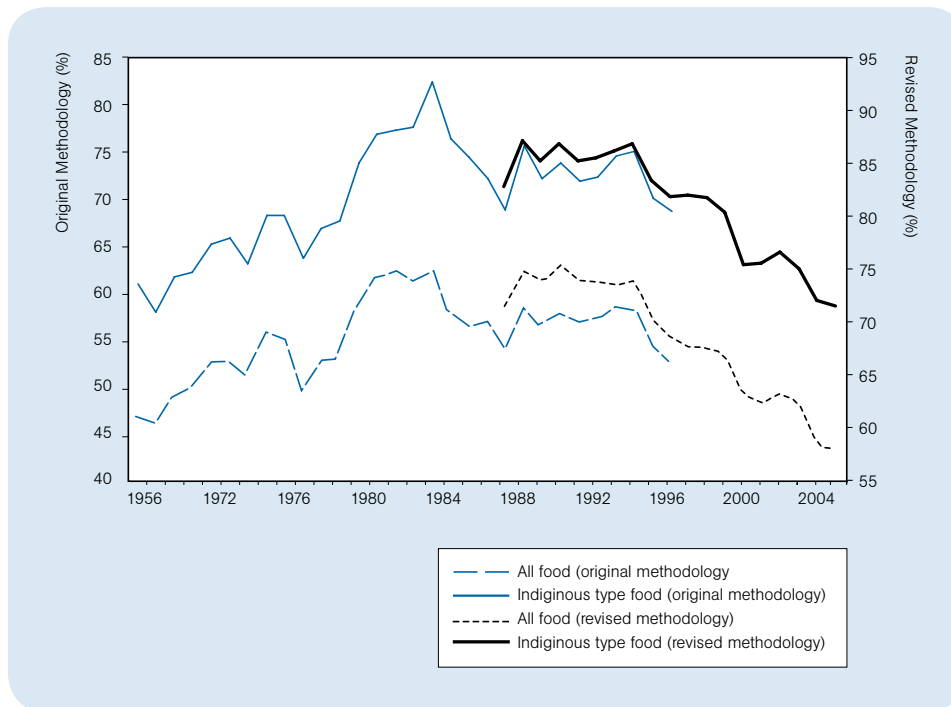


Figure 11b: UK trade as a share of economic activity



Source: *nef* estimates based on Office of National Statistics 2006 and World Bank 2005^{104,105}

Figure 12: UK self-sufficiency in food.



Source: Defra 2007¹⁰⁶

Food

'First there was a choice of melon or avocado from Israel, shrimp from South Africa, or rock oysters from New Zealand. With the Scotch beef came French beans from East Africa, asparagus from Florida, and a salad of lettuce and tomatoes from California. The dinner ended with a choice of strawberries from Mexico or mangoes from India, and California celery accompanied the English Cheddar Cheese.'

Arthur Veysey, Chicago Tribune London bureau chief, 1969

In the last few decades, food from around the world once enjoyed as a luxury is increasingly taken for granted. But now, a range of intensifying pressures is being brought to bear on the world food system. Climate change will alter what gets grown and where. Projections from the Hadley Centre of the UK Meteorological Office also show a future of dramatically increasing global drought. In addition, food crops are coming into competition with plants grown to provide for the expanding biofuel market. Increasing populations and demand for threatened water supplies bring yet more challenges for our ability to feed ourselves easily.

Agriculture is also hugely dependent on the fossil fuel, oil, both for transport, machinery and the manufacture of fertilisers and pesticides. But the price of oil is going up, and, to misquote Mark Twain's famous comment about land, 'they aren't making any more of it'.

Against this backdrop, the UK's food self-sufficiency is in long-term decline. It has been falling steadily since the early to mid-1990s. According to the most recent statistics available (and even allowing for changes in the way the Government calculates its figures), our domestic production of both indigenous food and all food types, appears to have hit its lowest point for half a century. We are increasingly dependent on imports at precisely the time when the guarantee of the rest of the world's ability to provide is weakening (Figure 12).

Fish and ships

On his failed journey to discover China in 1497, the Portuguese-born explorer, John Cabot discovered the North Atlantic cod fisheries. He reported that the waters of Newfoundland were so 'swarming with fish, which can be taken not only with the net, but in baskets let down with stone'.¹⁰⁷ For centuries, the fisheries were able to replenish themselves, but as the fishing vessels increased in size, the catches began to climb. But now, the tragic consequences of crossing ecological thresholds can be seen in the increasingly lifeless seas around Britain. Five hundred years after Cabot dreamed of dipping his basket in the water and hauling it out full of nature's bounty, in the early 1990s, the Atlantic cod fisheries collapsed from over fishing. Their numbers have yet to recover.

By 2003, the UN Food and Agricultural Organisation (FAO) estimated that three-quarters of the world's fish stocks were already fully exploited, overexploited or depleted.¹⁰⁸ And, the potential for us to completely lose the fish which have been part of our staple diet within our lifetimes is very real. At current rates of depletion, it's estimated that most fish stocks around the world will collapse by 2048.¹⁰⁹ According to the British government, the catch in the North Sea dropped from 287,000 metric tonnes in 1981 to 86,000 tonnes in 1991.

The UK currently consumes around 80 per cent of European cod and one-third of global stocks, mostly in the former national dish, fish battered and served with chips.¹¹⁰ Fried fish appeared at the beginning of the industrial revolution during the 1830s, when Jewish merchants distributed them from warehouses in the East End of London and Soho. Decades later the dish was accompanied by the 'chipped' potato to create the treasured tradition of fish-and-chips.

The trade of fish and fish products is big business. According to the FAO, trade in seafood products in 2000 reached \$55.2 billion. The EU is one of the largest fishing powers in the world, with over 88,000 registered vessels.¹¹¹ At the same time, the EU is collectively also the largest importer of fish in the world.

Once again, there is an enormous amount of two-way traffic. In 2006, the UK imported a total of around 721,000 tonnes of fish and fish products with a value of around \$3.1billion.¹¹² But in the same year, we exported over 460,000 tonnes of fish and fish products with a value of around \$1.7billion.

Table 5: UK imports of asparagus: main countries of origin.

1	Peru	72%
2	Spain	8%
3	The Netherlands	4%
4	Thailand	4%
5	USA	4%

Source: www.uktradeinfo.com (2006)

Consider the kiwi: the future fate of food freight?

Reasons for eating local produce: provenance, freshness, taste, local economic impact and community cohesion, and food security. But what about carbon emissions associated with transport? Most assume that the further a product has to travel the greater its carbon footprint. Food miles – how far food has travelled before it is bought – should be a fairly robust indicator of its footprint. But they are currently subject to lively debate. They do not *per se* consider a product's full environmental and carbon impact, and the precise mode of transport has a significant impact on the carbon footprint of the 'food mile.'

Take for example, air freight, used for high-value, light-weight, time-critical goods, such as flowers and fresh food. Only 1.5 per cent of fresh fruit and vegetables imported into the UK arrives by air, but because of the carbon intensiveness of air freight that tiny proportion is responsible for around 50 per cent of all emissions from the transport of fruit and vegetables.¹¹³ Transporting goods by air produces between 40 and 200 times the CO₂ emissions of shipping goods.¹¹⁴ Despite its bad environmental credentials, global air freight rose 3.8 per cent in a single year between 2006 and 2007, and is believed to be increasing within the UK at a rate of approximately 7.5 per cent per year.^{115,116} In 2000, air freight accounted for 6.9 per cent of all UK aviation emissions,¹¹⁷ and is forecast by the Manchester Tyndall Centre to rise much higher. But due to the environmental laundering common to long supply chains, these are all conservative estimates. To take just one example, strawberries from Egypt get flown into Europe and then road freighted to the UK.¹¹⁸ Such produce is classed as of 'EU-origin'.

Some suggest it can be more carbon efficient to import food from half-way around the world than growing it at home. A 2006 study implied that, even taking transport into account, importing food into the UK from New Zealand is significantly more carbon efficient than domestic production.¹¹⁹ The analysis focused on lamb, dairy produce, apples, onions, kiwifruit and grapes, all of which are sea freighted. What the report failed to consider, however, is perhaps more significant.

The report made a number of omissions, all of which significantly effect the study's conclusions. Transport and refrigeration are the two most carbon intensive stages in the food supply chain. Yet energy used in the mobile refrigeration of the products was not included in the assessment. Robert Heap, from Cambridge University, estimated that adding energy use for refrigeration increases sea-transport-related emissions by 50 per cent.¹²⁰

Also, isolated carbon efficiency is only one issue. Food security and overall environmental sustainability are increasingly important in a changing climate. It may be more efficient to produce green beans in Kenya, but what are the wider implications of a farm trade that is frequently foreign owned, water-intensive, and based on large-scale mono-cropping? In a region with high levels of poverty, prone to hunger and experiencing ever more erratic weather the question that needs to be answered is whether a trade in luxury horticulture makes people in Africa more or less vulnerable in an age of global warming. Especially when such farming practises are particularly vulnerable to climate variability and disease.

BA Perishables Handling Centre at Heathrow receives around 80,000 tonnes of fresh food and flowers each year. In April this year, poor weather conditions in Spain, mainly flooding, significantly disrupted supplies of salads into the UK. As a result, the volume of substitute supplies imported by air increased substantially. According to Christian Salvesen, the contractor for the Heathrow centre, 50 tonnes of iceberg and romaine hearts from California were handled over a 48-hour period to fill the gap in supplies. Throughout the remainder of the week imports continued to arrive in large volumes.¹²¹

While all the scientific research points towards the need to reduce carbon-intensive practices such as air freight, the practical commercial response to increasing unpredictability of supplies may well be to increase its reliance on air freight, so as to ensure continuity. When we know that we urgently need to reduce emissions, is it still realistic to demand that supermarket shelves are filled with every type of fruit and vegetable all year round?

Ecologically wasteful trade

Trade has an environmental impact that passes unnoticed like lorries trundling Europe's motorways in the dead of night. This cost is not recorded in national accounts as a loss. Neither are the greenhouse gas emissions of much international trade measured or included as targets for reduction in the global agreement to tackle climate change. But things get worse and more nonsensical than that. The global economy is still blind to the fact that it must operate within the fuzzy limits of its parent company – planet earth.

Fossil fuels are treated as free income to the economy rather than as the depletion of a finite asset. When burned, the cost of the social and environmental damage

Table 6: Randomly selected examples of ecologically wasteful UK trade

Ecologically wasteful trade	Trade partner	Import (tonnes)	Export (tonnes)
Chocolate covered waffles and wafers (small packs)	All partners	14,137	15,856
	Germany	1,471	1,950
	Austria	178	184
Gingerbread, sweet biscuits, other waffles, wafers	All partners	586	669
Gums and other jelly confectionary	Italy	612	665
Toffees and caramels	Canada	28	32
Fish	All partners	721,000	460,000
Milk powder (<1.5% fat) large packs	Germany	4,075	4,907
Milk powder (>27% fat) large packs	Germany	975	874
Butter	Belgium	291	139
	France	5,406	1,080
Potatoes (fresh, not new)	Ireland	30,000	60,000
	Middle East & North Africa	4,018	3,870
Ice cream	Sweden	2,257	2,297
	Germany	18,736	11,484
	Portugal	237	296
	Switzerland	334	569
Natural or artificial mineral waters (unsweetened / not flavoured)	Australia	21	20
Domestic vacuum cleaners	Canada	47	34
	Italy	64	73
Beer made from malt	Spain	12,739	13,742
	Australia	2,017	6,565
Beer	All partners	£370mn	£408mn

Source: www.uktradeinfo.com (2006)

they cause is not included in their price, leaving them hugely underpriced and sending the wrong economic signal. As a result, there are lorries, ships, planes and trains carrying identical and virtually identical goods back and forth throughout Europe and across the globe. This is ecologically wasteful trade.

Depending on your point of view, the sometimes arcane categories used to measure trade flows either enhance or mask the absurdity of the situation (Table 6). For example, in 2006 the UK imported 14,000 tonnes of chocolate covered waffles, and exported 15,000 tonnes. We both imported and exported 600 tonnes of, 'gums and other jelly confectionary'. We sent 21 tonnes of mineral water all the way to Australia and then brought 20 tonnes all the way back. Nine hundred tonnes of full-fat milk powder went from the UK to Germany, and 800 tonnes came back. Even more low-fat milk powder, 4,000 tonnes, yo-yoed back and forth between the two countries. Just to show that it is not all to do with food, we managed to export 64 tonnes worth of vacuum cleaners to Italy, and import 73 tonnes. The large two-way traffic of beer between Spain and the UK is also almost identical in amount.

Financial flows

What is the global economy for, and how do we know if it is succeeding? There is a confusion of signs. In the City of London in the UK, waiting lists for the ultra-rich queuing to buy petrol-hungry super cars are getting longer. For example, you would have to wait five years to get hold of a Rolls-Royce Phantom Drophead Coupe. The car costs \$412,000 and, driven in the city, it will manage just 12 miles on a gallon of petrol.

At the same time there is the prospect of potentially imminent and irreversible global warming. And, the share of the world's poor in the benefits of global economic growth has dwindled.

During the 1980s, the so-called lost decade of development, from every \$100 worth of growth, around \$2.20 found its way to people living below the absolute poverty line; a decade later that shrunk to just \$0.60c. That stretch of income distribution (a sort of flood up rather than trickle down) means that for the poor to get slightly less poor, the rich have to get very much richer. It now takes around \$166 worth of global growth to generate a single dollar of poverty reduction for people living below \$1 a day.¹²²

Globally, consumption is being driven up by Western lifestyles – themselves paid for by a reckless boom in lending and consumer debt, especially in the UK and USA – and by people in other parts of the world seeking to emulate such ways of living. Because of that, the world is going deeper into ecological debt as we take more than can naturally regenerate from the ecosystems upon which we depend. This pattern of consumption, coupled with extreme global inequality, is set to wreck international attempts toward poverty eradication through environmental degradation. In the current world economy, the rich must get much richer for the poor to become slightly less poor. A best estimate on current trends suggests that to raise everyone in the world to an income level of just \$3 per day – a level commensurate with reasonable life expectancy – it would take the equivalent in resources drawn from 15 planets like Earth.

In 2006, **nef** revealed that in spite of the UK Government's commitment to increasing its aid budget, another barely noticed trend cast questions over the nation's financial role in relation to developing countries. According to figures from the Bank of England, in a single year, 2005, money from developing countries deposited in UK banks surged by over \$115 billion to reach a total of \$385 billion. That trend continued in 2006 with an even larger surge of \$124 billion lifting total deposits to \$514 billion. The year saw a \$5-billion rise in deposits from just one country, Nigeria, dwarfing any improvements to the UK's aid performance. This was during a year in which Nigeria continued to be torn by internal strife over the distribution of benefits from its potentially hugely lucrative oil sector. Overall, a range of factors will be influential but, generally, the removal of controls over the movement of money around the world, and 'capital flight' are both likely factors.

Conclusion

This report on the state of Britain's interdependence wants to be more than thought provoking – it wants to be action provoking. Any declaration of interdependence can be boiled down to the fact that we are all in this – together.

But the fact that numerous leading politicians have toyed with the term 'interdependence' suggests that it is not enough to just invoke the phrase. Having arrived at our collective Interdependence Day we have to recognise that politicians have to do much more than boast of a willingness to make tough choices. They have to start offering tough choices to electorates that are founded in long-term social and ecological security.

Communications technologies make the presence of needless poverty and exploitation an ever-present source of shame in a world of unprecedented riches. The robust and urgent findings of the science of climate change see the natural world insisting on a new way of doing things. In short, there is no excuse for policies that fail to take account of our interdependent world. Generating these policies relies on an honest and open accounting of the real nature of Britain's interdependencies.

For example when it comes to considering the flows of skills and knowledge around the world we need to ensure that we are paying the full costs of importing, for example, health professionals from Africa by recompensing the health and education systems that have trained them.

In the case of climate change a lens on the problem that acknowledges our interdependence can serve to melt the short sighted pursuit of national interests that has blighted action on the ground. It can give energy to the political process. This report points to the urgent need to reverse trends that have seen a decline in our food self-sufficiency. We must increase energy independence by taking renewables and efficiency to the heart of energy policies. Transport and land-use planning need to work from the question 'how do we give people access to their needs and wants with big reductions in fossil-fuelled travel' not 'how can we meet our projections of increased demand for car and air travel'?

Reducing domestic emissions is key, but it is also important that we draw on the principles behind ecological footprinting to disclose the carbon, or environmental laundering that we indulge in by importing so many of our needs and wants from countries such as China. This kind of full disclosure needs to be part of our global regime to tackle climate change.

As a minimum commitment to positive global interdependence, the UK government can:

- Adopt the ecological footprint as an official measure, with a timetable, policies and resources to move the UK to live within its fair, per capita share of available global biocapacity – so-called 'one planet living'.
- Commit to reversing the decline in the UK's food self sufficiency alongside a published timetable.
- Commit to year-on-year greenhouse gas emissions reductions in line with a minimum cut of 80 per cent by the year 2050.

- Commit to greater energy security and independence by introducing significant measures for demand reduction, increased efficiency, deployment of renewable energy technologies and the introduction of more efficient, mini and medium scale grids for distribution.
- Take action to prevent the UK being a haven for dubious capital flight from developing countries.
- Compensate developing countries where a brain and skills drain of publicly trained professionals – such as from health services across Africa – benefits the UK.
- Celebrate the public enrichment that comes from living in a society comprised of many cultures that is part of an interdependent world. And, as part of that, to publicly acknowledge the day in the year when, in effect, the UK stops depending on its own means, and begins to live off the rest of the world.

We are convinced that such policies will address the negative and hazardous consequences of our global interdependence. But they will also represent investments that will nurture those elements of an interdependent world that allow individual and collective fulfilment: opportunity, hopefulness, creativity and confidence in a secure future.

Appendix 1: The Interdependence Project

Interdependence Day

New maps for an island planet

What?

This report forms part of the Interdependence Day project. The project aims to make space to consider new responses to issues of the environment, development and globalisation. Although they demand an integrated approach – the scale and complexity of the issues can seem beyond the reach of everyday life.

The Interdependence Day project aims to refresh jaded debates about sustainable development, globalisation and environmental change through a new body of work. This includes Interdependence Day: a public event including interactive workshops and debates, performance, art, craft, and well-known speakers; a range of publications; and a research programme.

How?

Since the launch of the Interdependence Day project in 2006 we have produced:

Publications:

- The UK interdependence report: *How the world sustains the nation's lifestyles and the price it pays* **nef** (the new economics foundation) 2006. www.neweconomics.org
- *Chinadependence: The second UK interdependence report* **nef** (the new economics foundation) 2007 www.neweconomics.org
- *Interdependence* Geography Compass, an academic survey of interdependence http://www.blackwell-compass.com/subject/geography/article_view?article_id=geco_articles_bpl015
- *Do good lives have to cost the earth?* Constable and Robinson, Spring 2008
Leading thinkers, designers, writers and politicians were asked by **nef** and the OU to give their response to the biggest question facing humanity: *Do good lives have to cost the earth?* The answer to the question will ultimately determine whether we have a future to fear or look forward to.
Find out more at: <http://www.constablerobinson.com/edition.aspx?id=16431>
- *Architecture and Interdependence* (forthcoming) A series of explorations in thinking about cities. For copies email Renata Tyszczyk at: r.tyszczyk@sheffield.ac.uk

Events:

- *Interdependence Day*: Events at the Royal Geographical Society, Kensington Gore, London, 2006 and 2007, and around the UK over the course of 2007. www.open2.net/interdependenceday
- *Economics & Social Research Council/Natural Environment Research Council Interdependence seminar series*. Includes four seminars around the themes: Interdependence (March 2006, British Antarctic Survey, Cambridge) Response/Responsibility? (Autumn 2006, London) Translations & Mediations (April 2007, Windsor), and Transformations (Autumn 2007, London) www.open2.net/interdependenceday

Broadcast:

- BBC Radio 4 *Material World, Interdependence Day special* http://www.bbc.co.uk/radio4/science/thematerialworld_20060706.shtml

Who?

The Interdependence Day project brings together organisations and individuals who are committed to better public understanding of the fate of the planet and the people with whom we share it. Initiated by Dr Joe Smith, current partners include The Open University Geography Discipline, **nef** (the new economics foundation), and The University of Sheffield Architecture Department

More?

For more information about the project contact the coordinator, Dr Joe Smith, The Geography Discipline, The Open University, Milton Keynes MK7 6AA, **e**: j.h.smith@open.ac.uk, **t**: 01908 654456, or Corrina Cordon, **nef**, **e**: corrina.cordon@neweconomics.org, **t**: 020 7820 6300



Climatespace is a user-built website that supports a range of people and projects who are exploring different ways to tackle climate change. The Climatespace site is a growing community providing online support for people trying to lead lower carbon lives in neighbourhoods, workplaces and organisations across the UK. All of the content on the climatespace site comes from the people who use it. Climatespace allows people and communities to share and learn from each others journeys towards good lives that don't cost the earth. Climatespace is part of a bigger project funded by Defra's Climate Challenge Fund 2006 which connects the website with climatetalk – a conversation kit, and Interdependence Day events.

www.climatespace.org

Do Good Lives Have to Cost the Earth?

edited by [Andrew Simms](#) and [Joe Smith](#)

Published by Constable & Robinson, January 2008

Climate change is currently presented by campaign groups and scientists as an impossibly daunting threat. On the face of it, it would seem we must make impossible sacrifices if we want to do our bit for the environment. This book shows that isn't the case at all. It brings together household names who share a conviction that, on the contrary, living well needn't cost the earth – and will tell you why and how. Their collective vision, covering areas from architecture and politics to food and happiness, will completely reframe the way you think about climate change and what you're willing to do about it. Far from doom and gloom, many here argue that climate change presents a once-in-a-century opportunity to do things differently. If we get things right, instead of an environmental apocalypse we could end up in a win-win situation – with both more satisfying lives and robust answers to these pressing, seemingly unsurmountable, problems.

Including: [Hugh Fearnely-Whittingstall](#) and [Rosie Boycott](#) on sustainable food; [Kevin McCloud](#) and [Wayne Hemingway](#) on design; [David Cameron](#) on good politics; [Tom Hodgkinson](#) on having a good time; [Anita Roddick](#) and [Larry Elliott](#) on good business and work; and, [John Bird](#), [Oliver James](#) and [Philip Pullman](#) on love, pleasure, happiness.

TOMORROW'S CLIMATE
Today's Challenge™

Appendix 2

Measuring human demand on the biosphere – the ecological footprint

Nature can keep up with the demands of the human economic activity it supports, with all its associated consumption of resources and dumping of waste, but only as long as it stays within the regenerative capacity of the biosphere – the living part of the planet.

Ecological-footprint accounting measures the extent to which the ecological demand of human economies stays within or exceeds the capacity of the biosphere to supply goods and services. These accounts help individuals, organisations, and governments to frame policies, to set targets, and to track progress towards sustainability.

Such accounting is possible because resource and waste flows can be tracked, and most of these flows can be associated with the amount and the type of biologically productive areas required to maintain them. The footprint of a population is the total amount of biologically productive land and water area that it requires to produce the resources it consumes and to absorb the waste it generates, using current technology. Since people consume resources and ecological services from all over the world, their footprint is the sum of these areas, regardless of where they are located on the planet.

The ecological footprint can be applied at scales ranging from single products to households, organisations, cities, regions, nations, and humanity as a whole. The footprint is used by governments, businesses, and organisations to measure and manage sustainability efforts, from communicating and planning to implementing and evaluating results.

Calculations in this report are based on the latest ecological footprint accounts published in 2006. These new accounts have generated the most accurate ecological footprint results to date. Due to the time lags between different data sources used for the calculation of the ecological footprint the 2006 accounts represent a snapshot of the state of the planet in 2003. However, taking the trend indicated from the most recently available five years worth of data, we have projected forward up to 2007 on the basis of that established trend.

The ecological footprint accounts are a continually evolving scientific process. With growing international concern on global environmental change, more and more useful datasets are becoming available. The greatest improvement since the inception of the ecological footprint accounts in 2002 has been the addition of detailed trade statistics in 2005, which allow us to more accurately track imports and exports of footprint and biocapacity at the national level.

The current global footprint

Earth's biologically productive area was approximately 11.2 billion hectares or 1.8 global hectares per person in 2002 (assuming that no capacity is set aside for wild species). Global hectares are hectares of biologically productive area with world-average productivity. This standardised measurement unit, or 'ecological currency', makes comparisons of demand and supply possible across the world.¹²³

The footprint measures the amount of area required to sustainably produce a flow of products. This may be larger than the area actually used to produce the product. For example, products from a forest being harvested at twice the replenishment rate would be calculated as having a footprint twice the area actually used. Carbon dioxide emitted in the production of goods for export is added to the energy footprint of the importing nation.

In 2002, humanity's demand on the biosphere – its global ecological footprint – was 13.7 billion global hectares, or 2.2 global hectares per person. Thus in 2002, humanity's ecological footprint exceeded global biocapacity by 0.4 global hectares per person, or 23 per cent. This finding indicates that the human economy is in ecological overshoot: the planet's ecological stocks are being depleted faster than nature can regenerate them. It is eroding the future supply of ecological resources and operating at the risk of environmental collapse.

The evolving methodology

Created by William E Rees and Mathis Wackernagel in the early 1990s, the ecological footprint methodology has matured considerably over the past 20 years. The methodology for calculating the ecological footprint is undergoing further revision by the Global Footprint Network and should be complete in 2008. A detailed explanation of the evolving science and methodology for calculating the ecological footprint is given in the paper: *National Footprint and Biocapacity Accounts 2005: The underlying calculation method* (2005).¹²⁴ A summary can be found in *Europe 2005: The Ecological Footprint*.¹²⁵



Global Footprint Network

Development and standardisation of this accounting method are currently coordinated by the Global Footprint Network which **nef** is part of. The Global Footprint Network supports the shift towards a sustainable economy by advancing the ecological footprint, a measurement and management tool that makes the reality of planetary limits central to decision-making everywhere. It was founded in 2003, and has 50 partner organisations. More on the science and methodology used to create ecological footprint accounts can be found on Global Footprint Network's website at www.footprintnetwork.org

Ecological Debt Day

Ecological Debt Day was devised **nef** as an innovative way to present the global ecological overshoot. It was first applied in the *UK Interdependence Report, 2006*.¹²⁶

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The UK goes shopping: how our high consuming lifestyles are costing the earth

These examples highlight the nature and scale of the UK's dependence on the rest of the world. They reveal both the big and growing burden our lifestyles place on the global environment as our self reliance declines, and the environmentally wasteful nature of the way we trade. If the world's population shared our lifestyles, more than three planets like Earth would be needed to meet the demand on resources. These illustrations of the demand our consumption of a range of goods places on the rest of the world show the challenge of increasing interdependence in a highly unequal world. Finding solutions means drawing new survival maps for life on an island planet.



* Includes cocoa and chocolate products

World ecological debt day calendar

SEP		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
OCT		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
NOV		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
DEC		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

One way of illustrating our impact on the environment that brings a sense of perspective, comes from looking at the day in a typical calendar year when the world, in effect, starts overshooting its biocapacity and begins eating into its stock of natural resources. The planet can tolerate a little give and take without environmental collapse as long as, in total, humanity lives within its overall ecological budget. The last year that humanities levels of resource use fell within the means of our life supporting natural assets was 1987. As global consumption grows, the day each year when the world as a whole goes into ecological debt creeps ever earlier in the calendar year. In 1995 it was 25 November. By the turn of the millennium world ecological debt day had advanced to 1 November. In 2007, the world's human population as a whole goes into ecological debt on 6 October.

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