GREENPEACE

nef

Cast adrift

How the rich are leaving the poor to sink in a warming world

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real wealth
means well-being

environment
lifestyles must
become sustainable

society
communities need
power and influence

nef (the new economics foundation) is a registered charity founded in 1986 by the leaders of The Other Economic Summit (TOES), which forced issues such as international debt onto the agenda of the G7/G8 summit meetings. We have taken a lead in helping establish new coalitions and organisations, such as the Jubilee 2000 debt campaign; the Ethical Trading Initiative; the UK Social Investment Forum; and new ways to measure social and environmental well-being.

The purpose of this briefing is two-fold. First, it is to show the comprehensive scale of adaptations that will be required the world over in the face of global warming. And, secondly, it highlights the shameful abdication of responsibility by industrialized countries, overwhelmingly responsible for creating the problem, to pay to help others, with far fewer resources, live with it.

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Summary and introduction

In 2001 the Intergovernmental Panel on Climate Change (IPCC) published the last comprehensive assessment of knowledge about global warming. In one area there was a particular black hole. "Estimates of the costs of adaptation are few," said the Synthesis of its Third Assessment Report. Partly the reason for this is because, as the IPCC says, "the available estimates indicate that costs are highly sensitive to decision criteria for… specific adaptation measures."

The other reason is possibly one of embarrassment. First, because governments in rich countries are still withholding from the general public the full scale of the changes needed to both stop and live with climate change. And, secondly, because of the pitifully small resources that are being made available by rich countries that created the problem, to poor countries who will suffer it first and worst. The clearest indication of this is the large sums of money, hidden across countless different government budget lines, being spent by rich countries to adapt at home to the global warming that is already inevitable.

Such a gap between rhetoric, obligation and reality is not new.

In 1992, at the original Earth Summit, the United Nations Framework Convention on Climate Change (UNFCC) was signed along with the detailed general programme of action Agenda 21. Inconveniently for politicians today, because it gives us all a ruler with which to measure our governments' response, the secretariat of the Earth Summit put a price on what it would cost to implement the new environmental agreements and meet their targets:

> *"Implementing Agenda 21 in low-income countries would cost an average of more than US$600 billion annually between 1993 and 2000, of which $125 billion would have to come in the form of international donations or concessions."*

But even in the euphoric atmosphere and optimism of the end of the Cold War, aid didn't go up, it went down. And the downturn began immediately after the Earth Summit in the period 1992–94. The Organisation for Economic Co-operation and Development (OECD) estimated that the cumulative shortfall from 1992–98, based on the level that aid would have reached if earlier trends had continued, was $88.7 billion. In 1998 alone the shortfall on the prior trend was $21 billion. In just one example, an extra three billion ECU promised at the time by the European Commission simply failed to materialise.[1]

Today, still no estimate has been made of what it will cost the majority world to adapt to global warming. The few lines of international assistance that do exist developed from arrangements made at the time of the Earth Summit.

The main conduit of funds set up at the time dedicated to sustainable development was the Global Environment Facility (GEF), operated jointly by the World Bank, the UNEP (United Nations Environment Programme) and the UNDP (United National Development Programme). The GEF now administers three new funds under the Climate Convention and Kyoto Protocol – a special climate change fund, a least-developed-countries' fund and an adaptation fund. In the year 1999–2000, GEF funding for climate change was $1.4 billion. Of this, only $199 million was grant funding; the rest was leveraged through co-financing.

In Marrakech in 2001 at the seventh Conference of the Parties to the climate convention (COP7) rich countries committed themselves to provide $ 0.41 billion per year by 2005 to help developing countries "manage their emissions and adapt to climate change".[2] Since then, however, only about $0.02 billion has been found. But

even the larger figure looks modest compared to the annual subsidy given by rich countries to their own, heavily polluting, fossil fuel industries, conservatively estimated at around $73 billion per year for the late 1990s.[3] And, compared to the scale of the problem, even the committed funds look hopelessly inadequate. As the official US Global Change Research Information Office points out:

> *"It is estimated that with 1.0 metre sea-level rise, protection of the vulnerable portion of the coastline of Dar es Salaam would cost US$380 million and protecting the populated coastline of Tanzania would cost US$14.6 billion."*[4]

Wealthy members of the international community, overwhelmingly responsible for current global warming, are obliged by international legal norms and moral codes to meet much of the cost of the problem in poor countries. This briefing illustrates their chronic failure yet to do so. It also reveals the current *'I'm all right Jack'* approach by showing some of the projected costs for adaptation measures planned or underway in the industrialised world. Though not directly comparable for a number of reasons, these examples highlight the unacknowledged scale and cost of the challenge facing poor countries. They show a wealthy minority casting the rest of the world adrift amidst a problem they had no role in creating. The IPCC comments that "there are few comprehensive estimates of the costs of adaptation." Even so, compared to the sums on offer from rich to poor countries, in just one case the cost of maintaining the functions of Japanese infrastructure alone against a one-metre rise in sea level is estimated to be between 11.5 and 20 trillion yen (roughly £65–100 billion).[5] Ironically, estimates show that in the US, energy demand would increase significantly to help adapt to climate change. The cost of meeting the higher demand might be between $200 and $300 billion, with annual costs rising by $33–73 billion.[6]

A note on blurred definitions

This briefing gathers together many of the general estimates and several specific examples of measures to adapt to global warming. But the difference between spending on *mitigation* – measures to curb greenhouse gas (GHG) emissions and arrest the problem – and *adaptation* – measures designed to help us live with now inevitable change – is not always clear-cut. For example, a deliberate shift towards low-input sustainable agriculture could both reduce the fossil fuel intensity of farming and increase crop resilience in the face of extreme weather. It would be a case of simultaneous *mitigation* and *adaptation*. The field then does not always have clear boundary markers. To isolate spending on adaptation is notoriously difficult. It can, for example, get swept up in the costs of post-disaster reconstruction. For example, how much of the money spent in Germany to clean up after severe flooding in 2002 which required about 17,000 people to be evacuated, could be called spending on adaptation?[7] Across the rest of Europe the flooding affected over 600,000 people and cost at least $15 billion. Or, similarly, how much of the money that went to reorganize health and social services in Europe following more than 20,000 deaths from the freak heatwave of 2003 could be called adaptation spending?

For one big reason, forcing a distinction between the cost implications of either can be counter-productive. Whilst *mitigation* and *adaptation* might seem expensive in the short-to-medium term, the failure to do either will mean much greater, and possibly incalculable, cost in the long-term.

The UNEP's Finance Initiative estimates that on current trends, worldwide economic losses due to natural disasters – the vast majority being hydro-meteorological and therefore directly affected by climate change – will hit $150 billion per year in the next decade: roughly three times the size of the global aid budget. As a former director of one of the world's largest insurance companies, CGNU, Andrew Dlugolecki did his own sums and came to an even more dramatic conclusion. Comparing annual average economic growth figures with a linear projection of rising climate-related damages, he concluded that by about 2065 damages would exceed gross world income. In other words, climate change will have bankrupted the global economy. The important thing, then, is action. Action to stop climate change, but not to ignore that for many people living in resource-poor countries 'dangerous' climate change is already with us. And, at the moment, these people are being cast adrift and left to sink by rich countries in a warming world.

Climate change adaptation costs for industrialised countries

Wildly varying estimates exist for what it will cost rich countries to adapt to climate change. Even when it comes to the more direct costs of implementing the Kyoto Protocol, the estimate for the European Union ranges from about €4 billion to €30 billion per year.

General cost estimates

The reason that even this better-studied area is so fraught with difficulty is summed up by the European Environment Agency (EEA):

> *"Important factors that influence the estimates include differences in cost definitions and baseline scenarios, the assumed effectiveness of policies and measures for reduction of emissions, and the greenhouse gases that have been taken into account (only carbon dioxide or all gases). A further important factor is different assumptions about using the Kyoto mechanisms: joint implementation, clean development mechanism, emissions trading and the EU internal emissions trading scheme."*[8]

Putting difficulties in finding the right numbers aside, Professor Jacqueline McGlade, Executive Director of the EEA concludes:

> *"The substantial financial costs for Europe's economy, people and ecosystems means everyone has to play a role and take account of climate change in their policy decisions… strategies are needed, at European, regional, national and local level, to adapt to climate change."* [9]

The range of adaptation challenges in Europe, even with all its enormous economic resources, is huge. They include:

- More frequent and costly storms, floods, droughts and other extreme weather hitting every aspect of peoples' livelihoods and the economy.
- Wetter conditions in northern Europe but drier weather in the south threatening agriculture.
- More frequent and more intense heatwaves, a proven and fatal threat to the elderly and frail.
- Melting glaciers, with three-quarters of those in the Swiss Alps likely to disappear by 2050, which will change the face of Europe.
- Rising sea levels threatening major infrastructure for centuries to come.

According to the EEA, two-thirds of catastrophic events since 1980 have been climate-driven by floods, storms, droughts or heatwaves. Such disasters doubled during the 1990s compared to the 1980s and now cost around $11 billion annually and account for 79 per cent of economic losses from catastrophic events.[10] The annual cost of adaptation in Canada was put at $11.6 billion by one 1999 study.[11]

Table 1 shows the range of adaptation strategies needed by Europe.

Insurance and business at risk

Climate change will necessarily have a growing impact on all economic sectors – an impact that is currently going largely unaddressed. The extent of the 'value at risk' from climate change could be as much as 15 per cent of the total market capitalisation of major

Table 1: Examples of adaptation strategies	
Climate change impact	**Adaptation strategies (examples)**
Increasing temperatures	Modify building design to cope with higher temperatures and enhanced need for summer cooling.
Precipitation extremes	Dams and other flood protection constructions, as well as urban storm sewage systems, need to be assessed for ability to cope with enhanced runoff from more intense storms.
Glacier retreat	Hydro-electric power plants in glacial areas need to adapt to reduced summer flow as glacial extent decreases and to enhanced winter flow as temperatures rise.
Snow cover	The skiing industry at lower elevations needs to diversify to take account of decreasing snow cover. Implementation of snow-making machines is a short-term strategy.
Arctic sea ice	Need to protect the habitats of indigenous people.
Rise in sea level	Infrastructure changes in vulnerable areas, for example, modification of harbours and ports, enhancement of existing sea defences and managed retreat in areas of low-value land.
Marine growing season	Manage changes in fishing and tourism (harmful algae blooms).
Marine species composition	Commercial fishing industry and policy-makers need to take account of shifts in the geographical distribution of species; for example, the northward movement of cod in the southern North Sea.
Species composition	Develop and manage strategies that create a porous landscape allowing species to migrate freely.
Plant species distribution in mountain regions	Establish ecological reserves to reduce additional pressure from land-use and tourism activities.
Terrestrial carbon uptake	Strategies to increase carbon sink strength of soils under agricultural land; establish long-rotation tree species; building design to incorporate more wood.
River discharge	Establish flood areas, enforce dikes.
Agriculture	New cropping practices to take account of longer growing season; development of two-crops-per-season agriculture. Establish new varieties; avoid agriculture in risk zones (flood areas, very dry soils).
Economic losses	Change construction design for buildings and infrastructure; avoid building homes in areas where risks of floods are high.
Human health	Educational campaigns to raise awareness about threats from tick-borne diseases. Campaigns to raise awareness about threats posed by heatwaves.

Source: European Environment Agency (2004)

companies[12] – potentially some £165 billion of the market capitalisation of companies on the FTSE All Share Index.[13] Failure to address the potential risks associated with climate change, which are faced by every business and investment portfolio, raises serious questions about the proper exercise of corporate governance and fiduciary duty. In addition, the failure of firms to report on their exposure to climate-related risk is creating a perverse incentive for investment in carbon intensive industries.[14] In one sense, the very scale of value potentially at risk means that the cost of corporate re-engineering to reduce that risk might appear to be negligible or negative in the long term. But corporations exist in the here and now and, initially, adapting to global warming is going to cost.

The risks to business from climate change fall into two broad categories. First there are the direct impacts from climate change in the form of flood damage resulting from rising sea levels, changing weather patterns and singular extreme weather events. Then there are the indirect risks associated with changing factor prices, demand conditions, policy changes resulting from carbon mitigation schemes (such as carbon emissions trading schemes, climate change levy etc.), political unrest, international conflict, risk to reputation and risk of litigation.

More immediate risks to business are, however, posed by the indirect effects of climate change. These include, but are not limited to, the introduction of carbon taxes and carbon trading regimes for large GHG emitters, plus the change in factor prices which will result from these additional costs. A recent Royal Society report promoting the replacement of the Climate Change Levy with a carbon tax, estimates that to reduce emissions in line with the UK's Kyoto commitment would require a 10 per cent increase in the price of petrol and a 15 per cent increase in the price of electricity.[15] If this relatively modest measure were to be taken up, adaptation in the business sector would mean having to rework their accounts to absorb such price rises.

A 15 per cent increase in the price of electricity, based on 2002 data, would represent an annual cost of more than £2 billion (see Table 2), just under half of it falling on the private sector, and slightly more falling on households.[16]

In a theme which keeps repeating itself, the most striking insight is the degree to which business is flying blind about the likely impacts of across-the-board adaptation. The IPO (initial public offering) by company Xstrata is a case in point. This major coal mining firm's Listing Particulars runs to 500 pages and yet climate change issues receive only a fleeting mention in two paragraphs. Significantly no mention is made of emissions restrictions or carbon tax or any other element of climate-related risk when discussing "Factors affecting the Business". Although from the statements that are included, such as: "Commodity prices are significantly affected by changes in global economic conditions and related industry cycles" and "Prices of commodity products… can vary significantly when supply and demand fluctuate" the section is rather short on useful information of any sort. Xstrata had to defend itself against criticism for its lack of disclosure following the announcement by the Japanese Government that it intended to impose a levy on coal as part of its commitment to reduce GHG emissions. Xtrata plc's share price fell 9 per cent in the space of an hour of this news and traded at a low of 490p, over 40 per cent below its price on flotation.[17] This information should not, however, have come as a surprise to Xstrata, since Japan, one of Xstrata's main customers, is a Kyoto signatory with a commitment to reducing carbon emissions by 8 per cent of their 1990 levels by 2012.

Similarly Alcan, in a Listing related to its merger with the Alusuisse group, did not find space to discuss its CO_2 emissions, other than in the context of the potential increased demand for the aluminium that would be required by automotive manufactures to reduce weight and increase efficiency in response to concerns about CO_2 emissions.[18] This ignored the fact that aluminium production is a particularly intense source of GHGs, and highly vulnerable to emissions legislation as a result.

Legal adaptation

Yet another adaptation cost comes from the potential for legal liability, as those affected by climate change seek redress in the courts from those they view as responsible. As scientific predictions on global climate change become more certain, and courts become more willing to hear cases from overseas parties, these risks may increase.

Already action is being brought before the US courts by Greenpeace, Friends of the Earth and the City of Boulder Colorado against the US Government. The plaintiffs claim that two government agencies – the Export-Import Bank of the United States (Ex-Im) and the Overseas Private Investment Corporation (OPIC) – have invested millions of dollars in overseas fossil fuel projects thereby contributing to global warming in contravention of the National Environmental Policy Act.

Increasingly there is the potential for companies to face lawsuits similar to those that have affected the tobacco and asbestos industries, particularly where companies are open to accusations of negligence in the face of clear scientific evidence. Parallels have been drawn, for example, between tobacco companies who knew of tobacco's addictive properties yet made claims to the contrary, and oil companies – specifically Exxon – who have consistently attempted to undermine scientific findings on climate change.[19]

Table 2: Cost of a 15 per cent increase in the price of electricity based on 2002 data

Electricity	Sales (£m)	Additional cost (£m)
Domestic	7,154	1,073
Industry	3,146	472
Commercial	2,895	433
Public administration and other services	645	97
Transport	218	33
Agriculture	213	32
Public lighting	75	11
Total	**14,346**	**2,152**

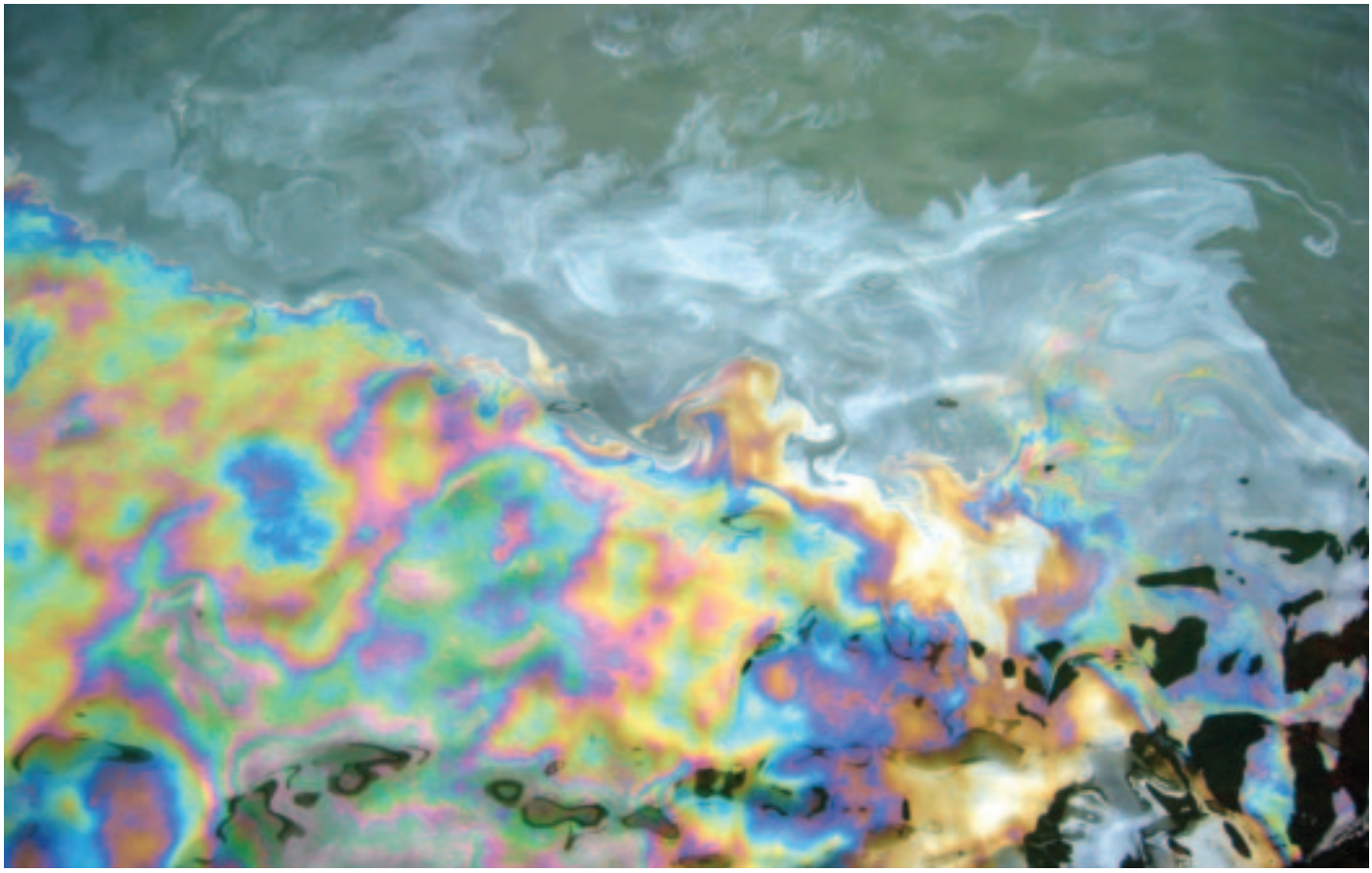
Source:
http://www.dti.gov.uk/energy/inform/energy_stats/total_energy/dukes1_7.xls

With the Kyoto Protocol now cleared to enter into force, there could be a logical adaptation and application of international economic rules. Outgoing EU Trade Commissioner Pascal Lamy indicated recently that businesses of non-ratifying countries like the US could be subjected to new trade restrictive measures from other trading nations who have ratified the Protocol, in the name of levelling the economic playing field.

There have already been clear hints from Pascal Lamy, outgoing EU Trade Commissioner, that Europe feels well within its rights to use economic measures against America. The most likely economic weapons would be so-called 'counter-subsidy' measures or 'border tax adjustments'. Both are acceptable in international trade where environmental agreements like Kyoto have been negotiated in good faith. In direct response to such a proposal, Pascal Lamy's reply was an example of the art of 'denial, non-denial'. It was a "thought provoking contribution", he said, though at the time "counterproductive" to contemplate trade action while the EU was persuading Russia to ratify Kyoto. But then he wrote, "There is a clear case for being aware of any adverse effects on our industry and doing everything in our power to minimize these", and further, "In that sense it is relevant also to keep under review the scope for action under WTO rules to 'level the playing field'."

Reputation risk

An area in which companies have not been slow to recognise the risk to their immediate future is in relation to the threat to their reputation and the threat to carefully



Photograph: Renee Lee

cultivated brand images. As the example of ExxonMobil illustrates, it can be very damaging to brand image, sales and thereby market values to be seen as 'environmental enemy No.1' – some estimates have put the value at risk from the 'Stop Esso' campaign at 10 per cent of its market value. With consumers increasingly willing to join in campaigns to boycott a company's products, companies are increasingly careful to appear sensitive to environmental issues.

Indeed the cynic might suggest that the vast majority of corporate initiatives on climate change and environmental concerns generally are mere window dressing aimed at mitigating just this type of risk. BMW, as a single example among many, makes much in its advertising and marketing literature of its commitment to and investments in fuel cell technology. Yet to date, not a single vehicle is in production. The global value of climate-focused cause-related marketing might be seen as another adaptation cost.

Such figures are not available but Exxon, for example, announced a $100 million endowment to Stanford University for climate research, particularly technological solutions. Many observers have suggested that this is more of an attempt to buy back some of the reputation lost through involvement in opposition to the climate change debate rather than a genuine acceptance that the company's future may depend on such research activities.

Insurance

More than many other sectors, the insurance industry is at the cutting edge of economic adaptation to climate change. Global firms like Swiss Re and Munich Re provide much of the original data on the economic costs of extreme weather events. From the household level to global agricultural production it is through insurance that the true costs of adaptation are most likely to be revealed.

Insurance estimates and rising dividend payments may also provide the missing link in bringing legal claims for compensation into the heart of the global warming issue. For example, when massive flooding hit Germany in the summer of 2002, interior ministry officials estimated the damage at €9 billion. One-third of a million people were affected. In 2003, heatwaves in Paris killed more than 11,000 people above the seasonal average, leaving countless aggrieved relatives. And the only thing holding back court claims has been the problem of attribution.

Looking at how the insurance market works for science journal *Nature,* Myles Allen from the physics department at Oxford University suggests that problem is now largely solved. "All you have to do", he writes, "is work out a 'mean likelihood-weighted liability' by averaging over all possibilities consistent with currently available information." Unpacked, that means that if past GHG emissions increase flood risk tenfold, and a flood happens, 90 per cent of subsequent damages can be attributed to past emissions. Because carbon dioxide mixes itself in the global commons of the atmosphere, "an equitable settlement would apportion liability according to emissions".[20]

As the Association of British Insurers (ABI) points out:

> *"Climate change is not a remote issue for future generations to deal with. It is, in various forms, here already, impacting on insurers' businesses now."*

The sector's response gives a window on private sector adaptation. It reports the main ways in which climate change currently affects the insurance business:[21]

- Changing customer needs, requiring new underwriting skills as customers seek to limit new liabilities arising from climate change regulation, or exploit new assets.
- Changing patterns of claims, principally on the household, property and business interruption accounts.
- New and tightening regulation, driving business costs and, increasingly, impacting on the investment environment.
- A source of reputational risk, requiring the industry to communicate effectively with customers, government and other stakeholders, so that they understand the financial consequences of climate change, the options for managing these and the response of the industry to these challenges.

Table 3: Preliminary estimates of future costs of weather insurance claims (£ million, in 2004 prices)

Today		
	Annual average	Extreme year
Subsidence	300	600
Storm	400	2,500
Inland flood	400	1,500
Coastal flood	–	5,000
2050		
	Annual average	Extreme year
Subsidence	600	1,200
Storm	800	7,500
Inland flood	800	4,500
Coastal flood	–	40,000 (London affected)

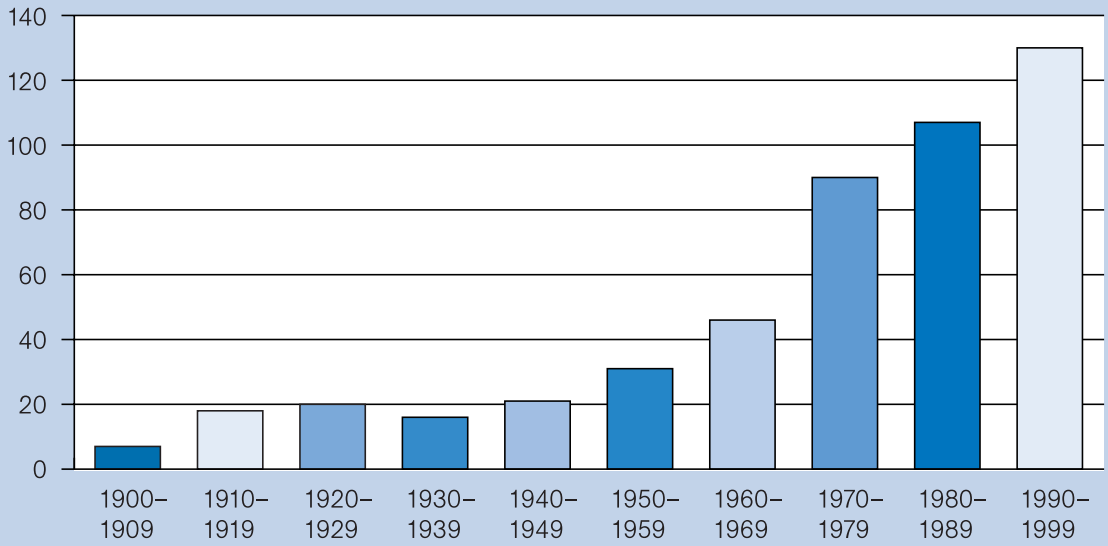
Source: Association of British Insurers (2004)

Table 4: Percentage of construction costs as additional costs for adaptation to climate change in OECD countries.

	Year	GDP in construction (US$bn)	estimated additional costs ($m) minimum	maximum
Australia	2002	24.8	248	1238
Austria	2003	17.7	177	884
Belgium	2003	13.4	134	670
Canada	2000	33.5	335	1677
Czech Republic	2003	5.4	54	271
Denmark	2003	9.4	94	472
Finland	2003	7.6	76	378
France	2003	81.3	813	4065
Germany	2003	94.8	948	4741
Greece	2003	13.6	136	682
Hungary	2003	3.8	38	188
Iceland	2001	0.6	6	29
Ireland	2003	11.1	111	554
Italy	2003	69.3	693	3467
Japan	2002	273.7	2737	13685
Korea	2003	51.2	512	2560
Luxembourg	2003	1.7	17	87
Mexico	2002	30.6	306	1528
Netherlands (The)	2003	27.4	274	1369
New Zealand	2000	2.2	22	108
Norway	2003	9.2	92	461
Poland	2003	10.7	107	534
Portugal	2003	9.1	91	453
Slovakia	2003	1.6	16	81
Spain	2003	75.9	759	3797
Sweden	2003	11.8	118	590
Turkey	2003	8.4	84	422
UK	2003	104.1	1041	5203
US	2001	471.2	4712	23560
Total OECD (excluding Switzerland)			**14,751**	**73,754**

Source: nef estimate based on OECD figures (www.oecd.org) and ERM percentage additional cost estimate.

Figure 1: Number of weather-related disasters in Canada 1900–1999



Source: Environment Canada

The 'risk transfer mechanisms' of insurance are likely to be applied in various ways to deal with their increasing exposure to extreme weather; to insure new technologies, such as renewable energy assets; and to manage new liabilities like directors being held responsible for the environmental impact of their businesses in the future.

For Britain alone, the ABI reports that weather risks are increasing by 2–4 per cent per year for households and other property due to changing weather. Claims for storm and flood damages doubled to over £6 billion between 1998 and 2003, compared to the previous five years. Other insurance areas that saw rising claims from climate-related effects including rising motor insurance claims, and human health effects that could "influence the balance between state and private provision of health care and pension products". Overall, for the industry, with damages hitting $150 billion per year in 10 years, insurers stand to be hit with at least $30–40 billion in claims annually.[22]

Insurance premiums are the reverse side of the coin of climate-related damage costs. They are deliberately long-term, so they are likely to represent a significant adaptation cost. As we are locked into an inescapable degree of climate change over the next 30–40 years due to past emissions of greenhouse gases, the insurance cost for particularly vulnerable infrastructure and sectors will continue to rise.

After flooding in autumn 2000, £25 million extra motor claims were made. Without further action, the ABI estimates that river and coastal flooding damages could increase from £1 billion per year to £20 billion per year.

Building and construction

It's increasingly evident following several severe flooding incidents in Europe and the United States that climate change will have a significant impact on the built environment.

According to the UK Government, the value of domestic property with a current one per cent risk of flooding is estimated at £200 billion. Floods in the winter of 2000/1 were estimated to have cost the insurance industry £750 million.[23] Box 1 indicates the comprehensive range of threats and likely measures needed for adaptation. There are enormous difficulties, and several unknowable factors, in estimating what the cost of adapting existing building stock, and 'climate proofing' new buildings will be.

But, as an example of what such costs might be, one analysis by British-based environmental consultants ERM gives an indication. Technical problems with dealing with economic, environmental and political variables, and the clash between climatic uncertainties and the 'need for precision in defining design specifications for infrastructure' means the cost estimates are given over a fairly wide range. Their conclusion was that Britain would face a 1–5 per cent increase on current building costs adding up to £26 billion 'aggregated over the entire building stock'. This estimate excludes the cost of adapting new-build commercial stock.[24]

If the estimate of 1–5 per cent of construction costs as additional costs for adaptation to climate change in the UK is broadly representative of other OECD countries, this would suggest adaptation costs in this sector in the order of US$15–74 billion per annum for OECD countries as a whole, around one-third of this arising in the US, and one-fifth in Japan.

Investments in early warning systems and weather forecasting

Catalysed by the progress of global warming, major new investments are being made in climate warning and weather forecasting systems. At the Massachusetts Institute of Technology (MIT) in the US they believe they are close to finding the 'Holy Grail of climate science'. A joint project potentially to be launched with NASA will be

Box 1: Climate change impacts on buildings and adaptation

Problem: Flooding of buildings will be more common under climate change. Flooding leads to damage of building contents, possible contamination from sewage, and structural collapse. Some buildings could become uninsurable if they are in particularly flood-prone areas.	***Adaptation**: Flooding can be avoided by careful siting of buildings, and buildings can be protected by embankments, or designed to minimise damage, e.g. using water-resistant materials.*
Problem: Increased rates of coastal erosion, due to sea-level rise and storm surges, can have catastrophic consequences for buildings in vulnerable locations.	***Adaptation**: Improving coastal defences can alleviate local problems, but they need to be carefully sited to avoid adverse consequences at adjacent areas of the coast.*
Problem: Subsidence is expected to increase in buildings on clay soils, due to higher temperatures, lower summer rainfall, and increased evapo-transpiration.	***Adaptation**: New buildings should include improved foundation design. Underpinning would reduce the effects of subsidence in existing buildings.*
Problem: If climate change leads to more frequent depressions (storms), there will be increased structural damage to buildings.	***Adaptation**: The level of damage could be reduced if more buildings were built to regulatory standards than is the case at present. Higher building standards may be needed in future, but careful design can also reduce the aerodynamic load on a building. For existing buildings, the options are more limited, and in some cases, retrofit of new roofs might need to be considered.*
Problem: Increased driving rain will occur, affecting building facades and internal structures and lead to more rain penetration around openings. More intense rainfall events could lead to drainage systems (including roof drainage, sewer systems, carriageway drainage etc.) being unable to cope.	***Adaptation**: Drainage systems and drainage design standards may need upgrading. Attenuation measures for dealing with surface water runoff, e.g. through the use of sustainable urban drainage systems (SUDS), lagoons, and soakaways should be promoted.*
Problem: Higher ground temperatures would lead to ground contaminants becoming more active, and consequently attacking foundations. Climate change will affect the durability of materials – in some cases the impacts may be helpful, while others will be detrimental.	Further research is needed.
Problem: Climate change is expected to reduce summer rainfall, so that pressures on water resources are likely to increase.	***Adaptation**: Planning for new developments, particularly intensive water users, will need to consider whether water resources can meet their requirements and should aim to improve water use efficiency.*
Problem: Higher summer temperatures could lead to a significant increase in the demand for air conditioning in buildings, and hence in higher summer energy demand.	***Adaptation**: Air conditioning should be seen as a 'last resort' adaptation option. More favourable options are to design-in more shading and natural ventilation, and to increase the thermal mass of a building.*
Problem: Flooding on site is expected to become more common.	***Adaptation**: The construction process could adapt to the impacts, however – for instance by increasing prefabrication.*
Problem: When a building regulation comes up for review, it is examined to see where it may be necessary to revise the technical requirements, in the light of climate change.	***Adaptation**: Changes to building standards, codes and regulations will help to avoid the worst potential impacts of climate change, but dissemination to industry of information about climate change impacts is also important.*
Benefit and problem: Higher winter temperatures under climate change would help reduce the UK's death rate from hypothermia, and decrease winter energy consumption. However, milder, more humid winters will lead to more mould growth in housing, which is already a major course of respiratory allergies.	**Benefit and problem:** The implications of climate change for the construction process are in some cases, in the short term, beneficial: less working days would be lost, as less snow and frost occur, but workers will be more likely to suffer heat stress in summer.

Source: Taken and adapted from *Workshop report: Climate change and the built environment research fora*, http://alcor.concordia.ca/~raojw/crd/reference/reference001424.html and *Assessment of potential effects and adaptations for climate change in Europe: The Europe ACACIA project*, Parry, M.L. (ed.) (2000)

used to measure soil moisture which they describe as "data needed to predict global change, assess global warming and support the Kyoto Protocol". The project is costing $218 million to design, build and launch. Such initiatives are key to adapting to the increasingly volatile weather patterns associated with climate change. Without them, vital economic sectors like agriculture become more vulnerable.

Citing the drought in the US Midwest in 1988 which started in a small area, the MIT team explains how, "the soil became dry and there was less evaporation, which meant less precipitation. Soon, crops and cattle were dying as the drought spread. The opposite happened in 1993, when the Mississippi River flooded for weeks on end."

Amongst industrialised countries, Canada has done more work than most to address the issue of adaptation. The government body Environment Canada estimates that $150 billion of their nation's economy is weather-sensitive.[25] The observed rise in the number of weather-related disasters has led to significant investment in adaptation and forecasting.

Of actual spending on 'Weather and Environmental Predictions' in the year 2002/3, $188.3 million (73 per cent) went to reducing the impact of weather and related hazards on health, safety and the economy, and $71 million (27 per cent) went on adaptation to day-to-day and longer-term changes in atmospheric, hydrological and ice conditions.

An innovative scheme in Britain called U R @ RISK promoted by the official body, the Environment Agency, in collaboration with the Met Office, involves sending flood warnings to people by mobile phone text message, e-mail and through the digital TV sets.[26] The scheme is funded by £2.7million of government money and has a target to "deliver effective and timely flood warnings to 80 per cent of those at risk by 2010". The Agency and Met Office also contribute their own funds to the £3.9 million total cost of the project over two years. Total spending on flood management by central and local government in the UK was budgeted at £492 million for 2004/5 and £550 million in 2005/6.[27]

Sea and river defences

The impact of climate change on sea and river levels is one of the areas that policy-makers have not been able to ignore, due to the imminent threat to important infrastructure and housing. The most apparent cases are small islands under threat, but there are also some considerable losses to be made by not protecting the shores from mounting water levels in OECD countries.

In the past century, the sea level rose by between 0.8 mm per year and 3.0 mm per year in Europe, and it is expected to continue to rise. Between 1990 and 2100 the projected rate of sea-level rise is between 2.2 and 4.4 times higher than the rate in the twentieth century.[28]

The United States

In the US, there are roughly 20,000 km (12,000 miles) of coastline and more than 32,000 km^2 of coastal wetlands. The land area of coastal counties comprises about 25 per cent of the total land area of the United States, and accounted for 53 per cent of the US population (141 million people) in 1997. The size of the coastal zone potentially at risk from sea-level rise is enormous and could have disastrous consequences.

Estimates of the cost of adapting to a half-metre sea-level rise in the US have ranged from $20 billion to $138 billion, where the southeast and mid-Atlantic coasts are the most vulnerable. One estimate of the financial cost of protecting all developed areas from a half-metre sea-level rise is $50–66 billion, with $115–174 billion for a one-metre rise.[29] Another estimate comes from a recent OECD paper, which projects that the costs of adapting to a one-metre sea-level rise would amount to $156 billion, representing three per cent of GNP.[30]

Not adapting has also proved costly. In 1993, for example, water flows in the Mississippi and Missouri watershed exceeded all measures ever recorded, leaving a bill for damages of between $12 billion and $16 billion.[31] Not surprisingly, insurance prices for coastal properties have followed suit and are increasing at a higher rate than the value of all insured US properties. Between 1988 and 1993, the total value of insured property in coastal counties from Maine to Texas increased by 69 per cent, from $1.9 trillion to $3.15 trillion.[32] Roughly 1,500 homes per year will be lost to coastal erosion for several decades, at a cost to property owners of $530 million. It is estimated that a half-metre sea-level rise by 2100 could cause cumulative impacts to US coastal property of $20–150 billion, without even including the prospects of increased storm frequency or intensity.[33]

Europe

A recent report from the European Commission highlights the 132,300 km under the direct threat of coastal erosion in the enlarged EU.[34] Roughly one-third of this area is rich in biodiversity and represents important ecosystems. Most of these sites are part of the EU's NATURA 2000 network of protected areas. The total value of economic assets located in the threatened area, which includes beaches, agricultural land and industrial facilities, is between €500 billion and €1,000 billion.

The report shows that 875 km of the enlarged EU coastline started to erode within the past 20 years and that the adaptation costs are increasing: in 2001 they were estimated to be €3.2 billion.[35]

Table 5: Erosion rates and protection costs for EU coastline

	Coastline (km)[37]	Eroding (%)	Eroding (km)	Protection cost ($m) minimum	maximum
Belgium	64	25.5	16	8.2	42.4
Cyprus	648	37.8	245	122.5	636.9
Denmark	7314	13.2	965	482.7	2510.2
Estonia	3794	2.0	76	37.9	197.3
Finland	1126	0.0	1	0.2	1.2
France	3427	24.9	853	426.7	2218.6
Germany	2389	12.8	306	152.9	795.1
Greece	13676	28.6	3911	1955.7	10169.5
Ireland	1448	19.9	288	144.1	749.2
Italy	7600	22.8	1733	866.4	4505.3
Latvia	531	32.8	174	87.1	452.8
Lithuania	99	24.3	24	12.0	62.5
Poland	491	55.0	270	135.0	702.1
Portugal	1793	28.5	511	255.5	1328.6
Spain	4964	11.5	571	285.4	1484.2
Sweden	3218	2.4	77	38.6	200.8
Netherlands	451	10.5	47	23.7	123.1
United Kingdom	12429	17.3	2150	1075.1	5590.6
Total EU	**65462**	**18.7**	**12219**	**6109.7**	**31770.4**

Overall, some 12,200 km of the EU's coastline is eroding – nearly one-fifth of the total – the worst affected countries (in absolute terms) being Greece, the UK and Italy. If the costs of coastal protection in the EU were similar to those for the US, estimated at $500–2,600 per metre (but much more for sea walls and bulkheads whose price range goes up to $13,200 per metre),[36] the overall cost would be between $6 billion and $32 billion (see Table 5).

There are numerous other 'spot' costs and estimates that have been made. This is a selection.

- **Italy –** The high economic value of the Italian coast makes it particularly vulnerable to sea-level rises. If the sea rises by 100 cm by 2100, Italy will need to protect almost its entire coast. One way of doing this would be to reconstruct the pre-existing dune as a first barrier to sea-level rise, which would cost about €30–50 million. In addition, houses worth €30–50 million would need to be demolished and there are also other additional costs, where no cost estimate is available.[38] The present value of the area at risk of permanent flooding between 2002 and 2100 varies from €130 million to €270 million.[39]

- **The Netherlands –** The Netherlands has already suffered from substantial flooding damages, and the potential for more is huge. Estimates show that losses in the order of €100 billion resulting from sea floods and €50 billion for river floods are conceivable. Relatively minor river flooding in December 1993 (loss of €100 million) and January 1995 resulted in total losses of €180 million. In September 1998, heavy rainfall occurred which caused losses of some €500 million.[40]

A staggering 67 per cent of the population in The Netherlands would be affected by a one-metre sea-level rise. To protect the affected area would cost about $12 billion, or 5 per cent of GNP.[41] Some staggering amounts have already been paid or are projected for protection against flooding. The construction of embankments in the province of Limburg in 1995 ended up costing about €80 million. The costs of flood protection of the Zandmaas/ Maasroute have been estimated between €380 million and €1,045 million.[42]

However, the concern is not just about rising sea levels. Climate change could enhance the risk of persistent drought, with corresponding low water levels. This could have substantial effect on transport, which could lead to a 10 per cent increase in transport costs by 2050. The annual costs of transport on the River Rhine could rise with between €80 million and €600 million.[43]

- **UK –** There are approximately 21 million properties in England and Wales, of which around 1.8 million homes and 130,000 commercial properties are at risk from inland or coastal flooding, along with 5 million people. Together with agricultural land at risk, these represent assets in the region of £220 billion.[44]

  Over the past 6 years, storm and flood losses in the UK have exceeded £6 billion – twice the previous period. The Government's *Foresight* report shows that if no action is taken against climate change, the annual average damages from river and coastal flooding could increase from the current figure of £1 billion to between £2 billion and £21 billion. The increasing risk posed by coastal erosion is the main driver behind increased national flood risk.[45]

  The risk is now so high that the ABI is worried about being able to cope. The Environment Agency will object to any planning application that is not accompanied by its own Flood Risk Assessment in local authority areas that are not guided by a Strategic Flood Risk Assessment. The lack of an appropriate Flood Risk Assessment currently accounts for over half of all sustained objections from the Agency. The targeting of new developments in Thames Gateway has led to time-consuming and costly processes for individual developers, costing around £50,000 per assessment.[46]

  The Environment Agency has estimated that the costs of upgrading the Thames' flood defences could be between £4 billion and £6 billion over the next 20 years. However, these figures are likely to be grossly underestimated, as they have been calculated without incorporating any impacts of climate change on present-day storm-surge heights.[47] DEFRA (Department for Environment, Food and Rural Affairs) has a long-term strategy to invest about £5 billion in coastal infrastructure between 2000 and 2015.[48]

  However, despite the scale of these figures, the ABI is concerned that it is not enough. For example, it points out that the £4–6 billion required to fund the upgrade in flood defences for the Thames Estuary over the next 20 years would take over half the national flood defence budget if no contribution from new developments were included. The Government's *Foresight* report suggests that a real increase in expenditure of £10 million to £30 million each year would be required to manage flood risk over the century and that by 2020, expenditure would need to be closer to £1 billion per year.

- **Germany, Japan, and Poland –** The adaptation/protection cost for Germany for a one-metre sea-level rise is estimated at $23.5 billion, which represents 2.2 per cent of GNP.[49]

  The adaptation/protection cost for Japan for a one-metre sea-level rise is estimated at up to $156 billion, representing up to 12 per cent of GNP.[50] The total expenditure to keep the present level of functions and stability for about 1,000 Japanese ports is estimated to be $110 billion in the event of a one-metre sea-level rise.[51]

  The adaptation/protection cost for Poland for a one-metre sea-level rise is estimated at up to $1.4 billion, representing 2 per cent of GNP.[52]

Drainage

Drainage costs, due to rising sea levels around Italy are estimated between €50 million and €100 million. This is cheaper than doing nothing, as potential damages are estimated at €130 million to €270 million, although it is believed that the adaptation cost is reasonably low, as the drainage system is already developed and works well.[53]

The ABI has pointed out that it is essential that UK water companies be allowed to raise the necessary funds (£1.2 billion according to their draft business plans) to maintain and improve their assets to reduce the incidence of sewer flooding.[54]

In Toronto, Canada, adaptation costs for wastewater treatment are estimated between CAN$633 million and CAN$9.4 billion, depending on risk aversion, while those for Niagara are CAN$8–24 million, Halifax and Penticton are estimated at CAN$8–14 million, around CAN$6.5 million and CAN$15–28.5 million respectively. However, no adaptation costs are anticipated in Montreal or Yellowknife.[55]

Based on draining projects in the Ottawa area, it is estimated that each 5 per cent increase in rainfall intensity increases the cost of pipes by 4–8 per cent and the cost of end-of-pipe storage by between 10 and 35 per cent.[56]

The cost of adapting the drainage system in the Fondi plain in Italy to an expected rise in the sea level is estimated at €50–100 million over the course of the next century.[57]

Health

While no comprehensive picture exists for health adaptation costs, indications can be drawn from related experiences. But changes to extreme weather patterns and new vector-borne diseases will bring inevitable adaptation costs.[58]

In the summer of 2003, an estimated 11,435 people died in France when a record-breaking heatwave struck in the first two weeks of August. A ministry of health report on the response of the public health system found a "lack of anticipation, organization and coordination". Responding to the report, Health Minister Jean-François Mattei, announced $748 million in extra funding for hospital emergency services.[59]

Malaria was officially eradicated in Europe in 1975 but is experiencing a come-back, with 12,000 cases per year in Western Europe. According to the World Health Organisation's Roll Back Malaria (RBM) Global Partnership, launched in 1998, fighting malaria can account for 40 per cent of government spending on public health. Poor families in the developing world spend up to 25 per cent of their annual income on treatment and prevention of malaria. The RBM initiative estimates that it will take "$2 billion per year to finance effective malaria control in Africa, and $1 billion per year for other malaria-endemic areas".[60]

Despite the lack of a comprehensive cost estimate for adaptation in the North, a picture emerges of the scale of the challenge. Picture these examples repeated across the developed world and the predicament facing developing countries is clear. In the US city of Philadelphia, its Hot Weather Health Watch/Warning System is estimated to have cost $50,000–60,000 to set up in 1995, with annual direct operating costs of $75,000 in 1995–98, rising to $115,000 in 2002.[61]

Another estimate for the cost of developing and installing a heat warning system in Rome, Italy is between $50,000 and $75,000.[62] Health Canada recently supported three projects totalling $700,000 to integrate research and policy on climate change and health.[63]

Analysing all the health-related outcomes of climate change and predicting human response to those outcomes may sound like an impossible task, but the US Environmental Protection Agency has enlisted dozens of researchers from 11 universities and public institutions to do just that. The Climate Change and Human Health website stems from a $3 million Environmental Protection Agency grant to Johns Hopkins University, and fulfils one of the Agency's main objectives. "One of the key purposes of the grant was to make this information public," explains Rebecca Freeman, a doctoral student in the Department of Geography and Environmental Engineering at Johns Hopkins, and the creator of the website.[64]

Water

Watershed degradation will be a common feature of a warming world. New York City's decision to invest in upgraded protection of its Catskills watershed gives an indication of the kind of costs involved in such major projects. Building a filtration plant was estimated to cost $6–8 billion, with annual operating costs of $300 million while repairing the degraded watershed would take "$1 billion to $1.5 billion, for land acquisition, new watershed rules and regulations, and financial assistance to watershed communities to promote environmental quality and their local economies".[65]

One Libyan project to pipe water 1,000 km from the southern Nubian Desert to the Mediterranean was estimated to cost $25 billion, but because the groundwater would have run out in 40–60 years, it was abandoned.[66] A water pipeline from Alaska to Lake Shasta, California (2,200 km), another adaptation measure in the face of climate change, would have cost US$110 billion.[67]

Other proposed projects include some short-distance cross-border water sales (Canada–US) by pipeline, e.g., from Coutts, Alberta to Sweetgrass, Montana. The US Army Corps of Engineers investigated water transfer from Mississippi/Missouri to High Plains.[68]

Agriculture

One cruel twist of global warming is that many of the rich countries responsible could, in the short-to-medium term, benefit agriculturally, with a longer growing season and the chance to extend the range of crops grown. The same cannot be said for much of Africa which faces a drop in the productivity of its farming.

Photograph: Pete Langshaw

However, the shape of agricultural adaptation in the North is also highly uncertain. As Britain's Ministry of Agriculture Food and Fisheries said in 2000:

> *"Even small changes in precipitation will have profound consequences for plant production… Decreased spring and summer rainfall would have serious implications, decreasing crop water supply, especially in light soils, increasing moisture stress and reducing growth. The impact on horticultural crops would be severe. Demand for irrigation would probably increase."* [69]

One of the perverse possibilities of a warming climate for Europe is a new mini-ice age that could result if the Gulf Stream that warms Britain and Western Europe is 'switched off'. In this case the challenge and cost of adaptation are likely to be great.

Any change in the climate, however, is likely to involve investments in agricultural technology; funds needed to develop new equipment; costs for disseminating information; education costs; the cost of climate information; and higher, per-unit costs of water.[70]

The cost of agricultural adaptation to the current climate in Canada has been estimated at over $1.3 billion, and the costs of other adaptations, for example, crop insurance, irrigation, research and development, are also likely to increase under climate change.[71]

A range of water-related problems point to the need for: "improving irrigation systems and adjusting the selection of planting dates and cultivars… longer and warmer growing seasons may allow earlier planting and harvesting dates" to avoid arid late summer conditions. According to the Canadian government, "these strategies, along with water transfers and changes to crop insurance programs, are adaptation options often suggested for dealing with future climate changes."[72]

To help farming adapt to changing climate conditions, in 1996–97 the Agricultural Research Institute of Ontario (ARIO) received CAN$42,356,784 from the Ontario Government for research purposes. A year earlier the federal government earmarked CAN$276.1 million for the Research Branch of Agriculture and Agri-food Canada.[73] An estimate for the benefit of adapting US agriculture to climate change was put at US$7–11 billion.[74]

Fisheries

Globally, while many key fish stocks are already under threat due to over-fishing, there is a reported degree of optimism about fisheries' ability to adapt to climate change. This, however, may be due to an assumption "that changes are gradual and predictable", which may not be the case.[75]

The challenge will then be to adapt: in living ecosystems populations can crash or relocate suddenly in response to new environmental signals. Adaptive interventions are needed. For example, Canada spent $15 million in 2000 dredging the Great Lakes in response to low water levels.

Tourism

Reliable weather is often one of the guiding principles for a tourist's decision to go to a particular destination. So far, the tourism industry has been slow to react to the challenges that climate change holds in store, despite the

fact that over half of the world's 715 million international tourist arrivals (2002) are concentrated in relatively few destinations, most which are part of the OECD. Over 50 per cent of the arrivals go to only ten destinations: the US, Germany, the UK, Japan, France, Italy, China, The Netherlands, Canada and Belgium/Luxembourg.[76]

In Europe, cold winters are expected to more or less disappear by 2008 and hot summers are expected to become more frequent. Ski resorts in the northern hemisphere have for some time been experiencing less and less snow and it has been estimated that the annual snow cover has decreased by about 10 per cent since 1966. The snow cover period shortened by about a week between 1971 and 1994 and this trend is likely to continue over the twenty-first century. Glaciers are also currently retreating, which will affect summer skiing in glacial regions.[77]

The European skiing industry is slowly waking up to the need for adaptation, but there remains a lot of scepticism. A focus-group study among tourism representatives in Switzerland revealed that while climate change was a known phenomenon, the information disseminated on the subject wasn't trusted. On the other hand, they did use climate change to legitimately forward strategies, which implies that some form of adaptation is already taking place, although not on a large or measurable scale.[78]

The impact of climate change on the skiing industry in Australia, Canada and the US is not expected to be as high as in Europe, due to an already high level of artificial snowmaking. However, the economic impact of additional snowmaking requirements remains an important uncertainty. In Canada, the average ski season in a case study area was projected to reduce by up to 16 per cent in the 2020s and up to 32 per cent in the 2050s. Snowmaking would increase by up to 144 per cent in the 2020s and up to 187 per cent in the 2050s. Without snowmaking, the season would reduce up to 57 per cent in the 2050s.[79]

Areas that are currently regarded to have a pleasant summer climate, like the Mediterranean, are also expected to suffer as the destinations become too hot. Sea-level rise is another problem that could put popular beaches under water, thus diverting tourists elsewhere. Northern Europe is sometimes seen as an alternative, but unpredictable weather makes this less likely. Extreme weather conditions will also take their toll on sensitive monuments and buildings, leading to faster deterioration and increased conservation costs.

What is far more apparent than adaptation costs is the scale of income loss for tourism destinations expected from changes in the climate. On average, each international arrival in Europe generates an estimated expenditure of $580, excluding transport costs. A change in tourism flows could have substantial effects on European economies. It is estimated that the Mediterranean might forego between 111 and 198 million arrivals by 2050 due to climate change, amounting to $64–110 billion in receipts.[80] In the US, for example, recreational beach visits account for almost 200 million visitor days per year. The total annual value of these visits has been estimated to be over $3 billion, something that could be under threat due to sea-level rise and increased temperatures.[81] In Switzerland, it is estimated that the potential annual cost of climate change accounted for by tourism could be as high as $1.2 to $1.6 billion.[82]

Conclusion

The purpose of this briefing is two-fold. First, it is to show the comprehensive scale of adaptations that will be required the world over in the face of global warming. And, secondly, it highlights the shameful abdication of responsibility by industrialised countries, overwhelmingly responsible for creating the problem, to pay to help others, with far fewer resources, live with it.

Against the meagre pledge of $0.41 billion in additional funds to help poor countries adapt to the problem, rich countries are making billions available to protect themselves. France alone is spending nearly twice that figure to adapt its health service in response to just one severe heatwave in 2003.

In the UK, official adaptation priorities are comprehensively laid out.[83] They cover coastal and river flood defence programmes, where spending already exceeds the total new amount committed to help the whole of the developing world. But also:

- Improved water resource management.
- Enhanced resilience of building and infrastructure.
- Management of wildlife, forestry and agriculture.
- Co-ordinated approaches to planning.
- Awareness raising of climate change impacts.
- Improved long-term and short-term risk prediction.

Given rich countries historical responsibility for global warming, and the resources at their disposal, at the very least we believe that funds available for adaptation should be raised substantially. But to what level? We need to take account of the globally agreed Millennium Development Goals for poverty reduction, which have their own costs attached, costs far higher than the nature and level of current aid programmes will pay for. Excluding health and sanitation this calls for an extra $50 billion per year.

The additional costs of adapting to climate change are unknown. An initial assessment based on the best available predictions for various scenarios of warming is needed. Until that happens, however, rich countries could, as a minimum, make additional funds available equal to the amount they use to subsidise their domestic polluting fossil fuel industries. Using the late 1990s as a benchmark, a conservative estimate suggests that rich countries' fossil fuel subsidies stood at around $73 billion per year.[84] That would, perhaps, be a good place to begin the upward bidding.

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One of the other things we do

Local Works: Local people must be put back at the heart of their local economies. Policies that favour the large and remote are threatening the vibrancy and diversity of our communities, bringing Ghost Town Britain. Giving real power to local people can reinvigorate our local rural and urban economies.

nef is leading this campaign characterised by a highly diverse membership that seeks to combat the spectre of 'Ghost Town Britain'. It promotes the importance of local sustainability and self-determination. For example, Local Works was a big part of the campaign to defend community pharmacies. Taking as a starting point the fact that local communities should be more in charge of their own economies, education, healthcare, consumer and leisure needs, Local Works is campaigning for a legal framework that can make this happen.

The needs of communities must be at the heart of environmental, social and political justice. At a time of growing disenchantment with political processes, individuals and communities can and should have a real impact on how money is spent in their communities and what they invest in. Having a tangible impact on the delivery of services is a vital tool for political, social, environmental and economic reinvigoration in all of our communities.

Local Works recognises that there is no single blueprint, but that communities should draw up and implement their own plans to achieve these goals.

environment
lifestyles must
become sustainable

Current priorities are climate change, ecological debt and local sustainability

For more information please call 020 7820 6300

Written by: Andrew Simms, David Woodward and Petra Kjell
Edited by: Mary Murphy

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new economics foundation
3 Jonathan Street
London SE11 5NH
United Kingdom

Telephone: +44 (0)20 7820 6300
Facsimile: +44 (0)20 7820 6301
E-mail: info@neweconomics.org
Website: www.neweconomics.org

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