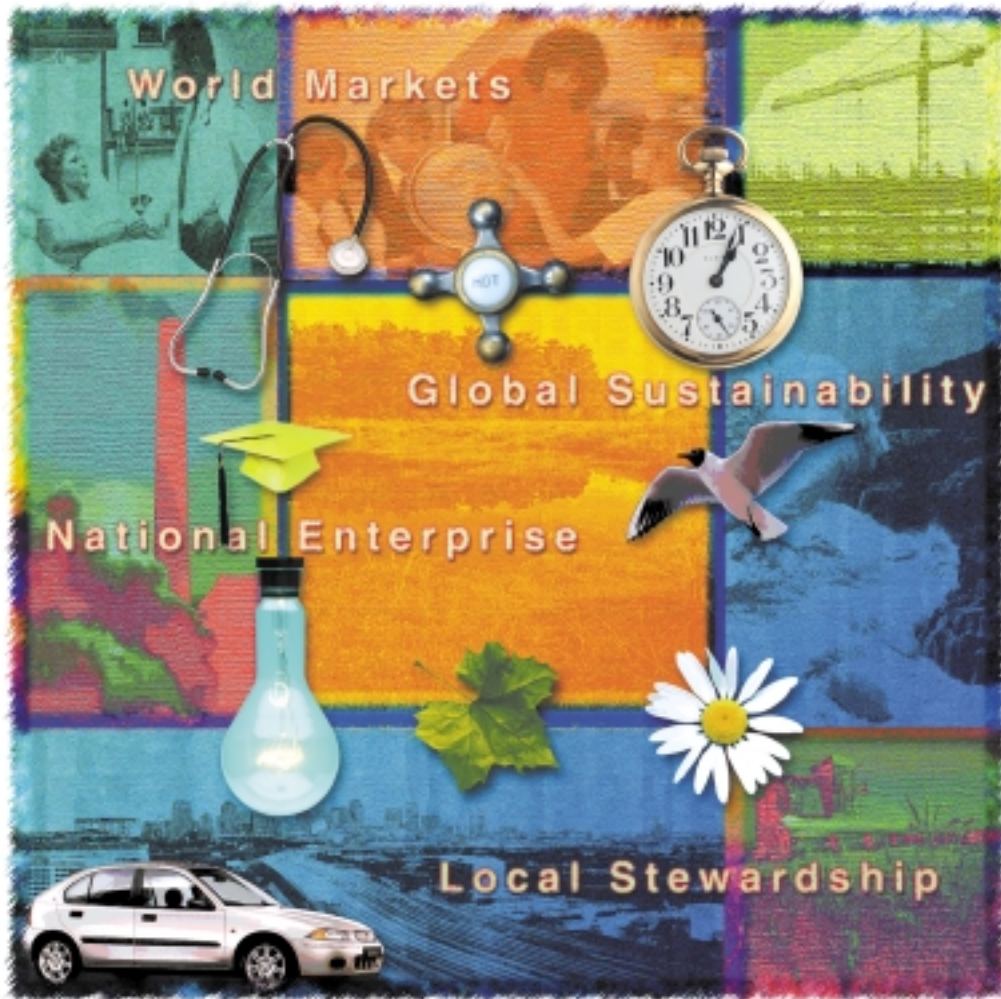


THINKING *Ahead*



Socio-economic scenarios for climate change impact assessment

THE FUTURE IMPACTS OF CLIMATE CHANGE

It is now recognised by scientific experts the world over that humankind's emissions of greenhouse gases like carbon dioxide have already led to global warming and that those same gases are very likely to change our climate over the next 100 years.

Climate change is, it would appear, already with us. Over the last 300 years temperatures have increased by 0.7°C over Central England with 0.5°C of that rise occurring during the 20th Century alone. Over recent years the changes have been felt ever more intensely. 1999 was officially the joint warmest year ever recorded in the UK and the top ten warmest years globally have all occurred since 1980.

Though variations in climate and weather are entirely natural, it is clear now that a significant and pronounced shift beyond natural variability is underway. In 1998 UKCIP published its first climate scenarios, based on the world-renowned, computer-based climate models at the Met Office's Hadley Centre and research at the Climate Research Unit, University of East Anglia.

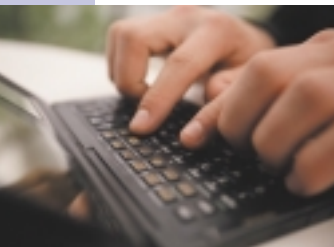
Based on current climate projections, it is likely that by the 2050s UK summer temperatures will increase by between 0.7°C and 3.1°C. Winters will be milder too. Summer rainfall will decrease by up to 22% in South East England while there is an expected increase of precipitation during winter of between 6 and 15%. Sea levels around the UK could rise by as little as 2cm in western Scotland and as much as 83cm in East Anglia. Wind speeds are expected to increase, mainly in Autumn and there may be more extreme weather, such as storms and gales.

As our climate changes there will be more flooding and more storm damage. Hotter summers could be followed by wetter and windier winters. Businesses like insurance, utilities and manufacturing will feel the strain as the stress on infrastructure and the built environment increase. Culture, leisure and tourism may see new market opportunities develop. Flood defences will have to be strengthened. Rare habitats and species may be threatened as the environment changes around them. Everyone will have to adapt to the changing climate, from farmers to architects to local authority planners.

In short, it is difficult to find a corner of human life that will not, in some way, feel the impacts of climate change in the years ahead.



“ 1999 was officially the warmest year ever recorded in the UK ”



Useful weblinks:

- **UKCIP:**
www.ukcip.org.uk/ukcip.html
- **Hadley Centre:**
www.metoffice.com/research/hadleycentre
- **The Intergovernmental Panel on Climate Change:**
www.ipcc.ch
- **Department of the Environment, Transport and the Regions:**
www.detr.gov.uk

LOOKING INTO THE FUTURE

Times change. Just take a look at the last 100 years alone. The population in the UK has grown by more than half, from 38 million in 1901 to 58 million today. The number of houses has trebled and the percentage of those houses actually owned by the people living in them has shot up from 10% at the start of the 20th century to 68% as we enter the 21st.

Our lives have changed and they have lengthened too. Life expectancy is now 75 years for men where it was 45. Women now can expect to live to 80, not 49. Our urban and rural environments have changed dramatically. Transport systems are unrecognisable. Communications are largely digital. Our Gross Domestic Product has mushroomed by 298% in those dramatic, eventful 100 years as our spirit of enterprise has shifted through manufacturing decline to the new 'knowledge' economy.

It is because our lives, businesses and environments can be expected to change just as significantly over the next 100 years that a set of scenarios has been developed for the UK Climate Impacts Programme (UKCIP) to sketch out some of the possible social and economic futures which lie ahead.

One of the most striking aspects of climate change is that it touches so many areas of human activity. Few businesses or arms of government, for example, can say with authority that their work will not be affected as our summers grow warmer and our winters grow wetter, as wind speeds increase and the growing season lengthens. Big changes lie ahead, and all of us need to think through and

figure out what climate change may mean for our work, our lifestyles and for the society which surrounds us.

Computer-driven models of climate change can tell us what sorts of changes we might expect over the next 100 years. What our climate models cannot tell us is what the UK will be like in 2012, or 2022, or 2048. That is where the UK Climate Impacts Programme's Socio-Economic Scenarios come in.

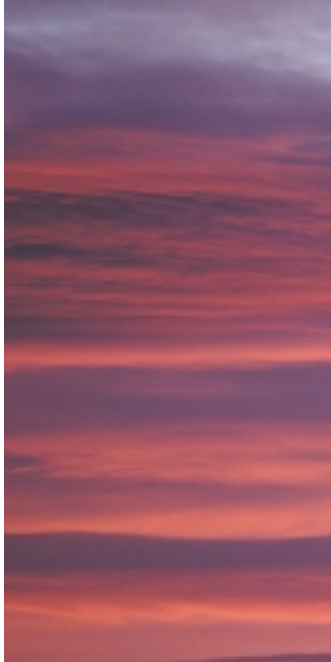
Using these scenarios hand-in-hand with UKCIP's climate scenarios, strategic thinkers and decision-makers can start to plan for this uncertain future.

MAKING UKCIP WORK FOR YOU

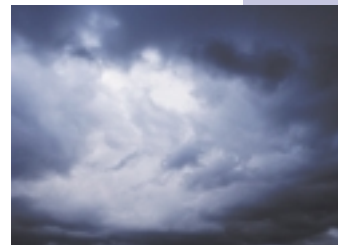
Exploring the future for areas like water, or agriculture, or planning, the UKCIP Socio-Economic Scenarios are designed for use with other key UKCIP tools. Taken together, the range of studies and datasets offered by UKCIP represent a world-class toolkit for private and public sector decision-makers who need to prepare for climate change. In addition to the UKCIP98 Climate Scenarios, a methodology for costing the impact of climate change and for managing risk and uncertainty are due to be published shortly, while new climate scenarios will be published in 2002.

Contact UKCIP and we will be happy to supply you with the studies, data, contacts and analytical tools you are likely to need as you plan for the future.

Call us on 01865 432076 or email ukcip@ukcip.org.uk



" our lives, businesses and environments can be expected to change..over the next 100 years "



Useful weblinks:

- **Foresight programme:** www.foresight.gov.uk
- **The Centre for Tomorrows Company:** www.tomorrowscompany.com
- **Debate of the Age:** www.age2000.org.uk

CREATING SOCIO-ECONOMIC SCENARIOS

At present there are a number of long-range planning projects being conducted worldwide but in many respects we are still making decisions based on very short-term horizons. Official trends and statistics from Government, for example, are often just extrapolations of current trends and not true attempts to map out future scenarios. With the exception of population data, these extrapolations rarely reach further than 15 or 20 years into the future. Land-use planning in the UK forges ahead no further than 2021, while in the private sector it appears only a few large multinational corporations are developing strategic, long-range planning, with most smaller businesses focussing merely on the next year or so.

The uncertainty and complexity of future scenarios led UKCIP to commission a set of socio-economic scenarios which would be relevant to decision-makers in the private and public sectors and which would actively involve stakeholders. The scenarios would also have to be consistent, both with other long-range scenarios already in use in the UK and Europe and also across the wide range of planned UKCIP studies. This consistency and a common set of tools will be vital if we want a study into, for example, human health and climate change to sit comfortably alongside a study into the construction industry. While individual research teams may tailor both climate and socio-economic scenarios to their own needs, a common framework will assist each interested party in making the most of this valuable research.

A number of existing projects had to be taken into account as these socio-economic scenarios were created. The Intergovernmental Panel on Climate Change has developed new socio-economic scenarios to project emissions of greenhouse gases for use with global climate models. More locally, the UK's own, government-supported Foresight initiative has been developing a suite of long-range scenarios of the future around 13 panels covering areas like population, the built environment, energy, finance, manufacturing and healthcare.

Sussex University's Science Policy and Research Unit (SPRU), was commissioned to create UKCIP's socio-economic scenarios for the 2020s and 2050s, building on these established areas of research. Working with experts from the Centre for Social and Economic Research on the Global Environment, the University of East Anglia's Climatic Research Unit and the Policy Studies Institute, their brief would take in economic activity, population and settlement patterns, technological change, as well as the ability of policy-makers to take climate change on board and society's willingness to address serious environmental concerns.

While we cannot confidently say we "predict the future", the SPRU team has created a set of storylines or sketches of future trends that can be used as a tool for thinking about the future. Demography and settlement, economic growth, social and political values, technological change, and governance are the key themes throughout the scenarios but our future values and how we are governed in the 2020s and 2050s represent the most powerful and dominant trends.



" The brief included economic activity, population and settlement patterns and technological change "



Useful weblinks:

- [Foresight](http://foresight.gov.uk): www.foresight.gov.uk
- [IPCC](http://www.ipcc.ch): www.ipcc.ch

THE UKCIP SOCIO-ECONOMIC SCENARIOS

The UKCIP scenarios differ from the Foresight scenarios in that they are specifically designed to tie in with the timescales of the climate scenarios and to provide the type of detail likely to be of use for regional and sectoral studies. For example, they give greater emphasis to the possible changes to regions and to certain types of geographical domain.

For values, at one extreme there is a future where values come to be dominated by the desire to consume, to enjoy the maximum personal freedom whatever the cost to wider society, a 'me' culture (consumerism). At the other end of the values scale is a more collective, ethical values set where the common good is of greater concern (community).

When it comes to governance, the scale shifts in these scenarios from a more internationalist set of power relationships where national boundaries and national power are of less importance (interdependence). At the other end of this scale, national and regional power continues to dominate and the p of globalisation has been constra (autonomy).

Though these are not the only pc trends for the UK when it comes values or the way our governer these two scales do give us a frar to draw a series of pictures of the future which can powerfully illu the likely impacts of climate char

The next step for the scenarios re team was to create a series of fut using the above scales. These futi depicted here as 'world markets', enterprise', 'global sustainability' and 'local stewardship'. The scenarios are not exclusive. As they are tailored to individual sectors or regions it is perfectly possible that aspects of, for example, 'global

sustainability' may sit alongside 'local stewardship' or even 'world markets' in the years ahead.

These scenarios have already proved a powerful tool for a number of studies conducted across the UK. The climate change impacts scoping studies for South East England and Wales have used them to good effect, while the research team working on water, biodiversity and agricultural issues in East Anglia and the North West (REGIS) have applied them to their findings. In the North West, the Northwest Climate Group have used the UKCIP socio-economic scenarios to map out important climate change issues for their Regional Development Agency and for Regional Planning Guidance.

This new approach to thinking about the future cannot provide all the answers, but it can offer a framework for identifying the key factors that will influence it.

Four socio-economic scenarios for the UK



" our future values and how we are governed represent the most powerful and dominant trends "



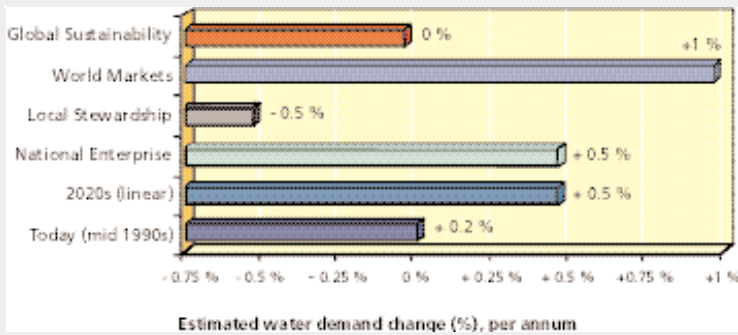


THE SCENARIOS IN ACTION

Moving from community to consumerism, or from autonomy to interdependence, there are a vast range of possible future societies or economies. To focus these scenarios some key areas for discussion were selected. These included economic development, planning and the built environment, agriculture, water, biodiversity and coastal issues. Here we sketch out what the four UKCIP socio-economic scenarios could mean for four crucial areas of concern.

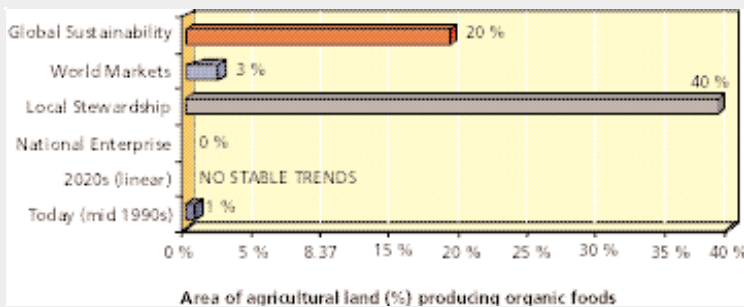
WATER DEMAND

In the more consumerist society depicted under National Enterprise, water supply systems are likely to come under greater strain as demand increases unfettered by the moves towards water conservation you could expect under Local Stewardship, for example. Under World Markets the increase is less marked as global price pressures force utilities, in the hope of an improved 'bottom line' performance, to reduce leakage rates and promote the more efficient use of water. Global Sustainability shows no net gain in demand as, in particular, technological innovations and global treaties on environmental protection help to reinforce greater efforts for water efficiency.



AGRICULTURAL TRENDS

The complexity of the differing future scenarios is well demonstrated when you examine agricultural trends. Organic production, for example, is likely to flourish under Local Stewardship as more local, small-scale, organic produce is demanded by a population concerned about the environmental and animal welfare impacts of modern agriculture. However, our Local Stewardship scenario shows that biodiversity could suffer as agriculture becomes more extensive and takes up more land. Under World Markets, on the other hand, organic production remains low and, for example, genetically modified crops take centre stage as the market pushes this technology forward.



Climate impact research is just at the beginning. UKCIP hopes these scenarios will help scientific assessments take better account of the future economy and society. With the publication of the new climate scenarios in 2002 guidance on the use of the socio-economic scenarios will be updated.

THE SCENARIOS IN ACTION



FUTURE TRANSPORT

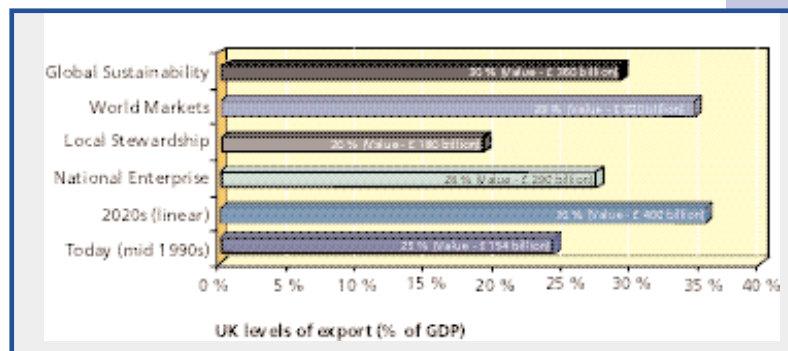
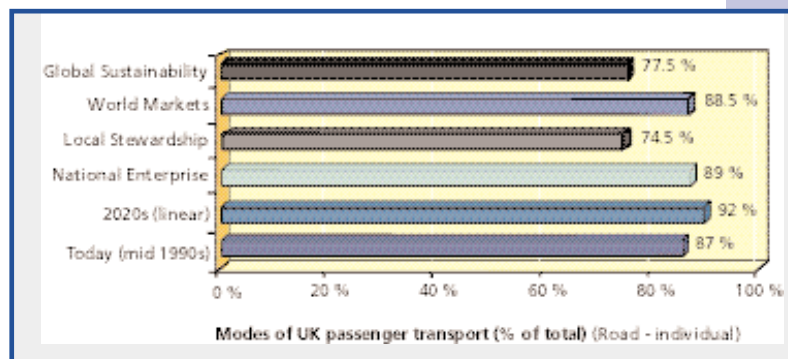
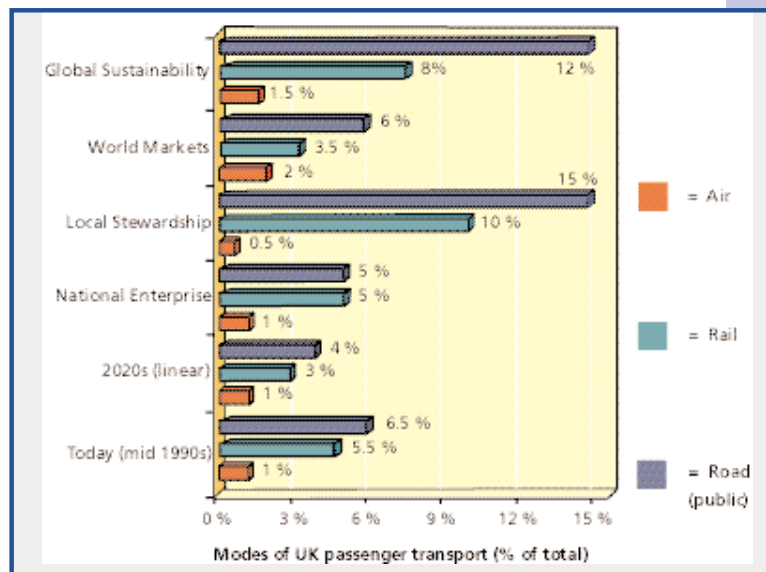
Global sustainability presents one of the most interesting scenarios when it comes to future modes of transport. There is every likelihood that real tensions could develop within a society which is demanding more mobility, a greater level of international connectedness but which also puts environmental issues very high on the agenda. This tension is shown most strongly in the levels of air travel.

Elsewhere, modernisation and investment in infrastructure differs between the scenarios, with problems of under-investment within Local Stewardship compared to much more efficient freight and passenger transport under Global Sustainability. Under World Markets and Global Sustainability, telematics may come to offset physical travel and the cost of many forms of transport may increase. Under Local Stewardship transport costs increase even more dramatically as economic measures are used to force people to walk, cycle, car share or use public transport.

ECONOMIC DEVELOPMENT

A more insular, protectionist world view dominates under National Enterprise and Local Stewardship which reduces the competitiveness of the UK economy and slows growth, even though under the former scenario this is seen as a national priority. Under Local Stewardship smaller-scale production is encouraged by a more interventionist political culture. For both these scenarios, sectors dependent up international trade may suffer. The globalised, liberal culture of world markets sees a significant retreat of the state as historically rapid economic growth occurs. This growth is, however, accompanied by a greater level of decline in traditional sectors like mining, agriculture and manufacturing.

Global Sustainability achieves a better balance between commercial, social and environmental interests as international research, and well-supported levels of research and innovation reduce the tensions between economic growth and social harmony. Again, the service sectors win out over the more traditional forms of industry.



CONTACT DETAILS

Established in April 1997 by the UK Department of the Environment, Transport and the Regions, the UK Climate Impacts Programme helps organisations assess what climate change will mean for them.

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