



Key skills communication Level 3 - Climate Change

Tuesday 11th March 2008

Source Booklet

- This booklet contains source material for the level 3 communication test, **Climate Change**
 - The test questions will be based on this material
 - You must hand in this source booklet at the end of the test, along with your question paper and answer booklet
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The level 3 communication test will assess your ability to:

- select and read material to obtain the required information
- identify accurately, and compare, the lines of reasoning and main points from the text and images
- synthesise the key information in a way that is relevant to the purpose
- select and use a format and style of writing that is appropriate to the purpose and subject matter
- organise relevant information clearly and coherently
- ensure text is legible and spelling, grammar and punctuation are accurate

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Britain faces big chill as ocean current slows

JONATHAN LEAKE, SCIENCE EDITOR

CLIMATE change researchers have detected the first signs of a slowdown in the Gulf Stream – the mighty ocean current that keeps Britain and Europe from freezing.

They have found that one of the “engines” driving the Gulf Stream – the sinking of super cooled water in the Greenland Sea – has weakened to less than a quarter of its former strength. The weakening, apparently caused by global warming, could herald big changes in the current over the next few years or decades. Paradoxically, it could lead to Britain and Europe undergoing a sharp drop in temperatures. Such a change has long been predicted by scientists but the new research is among the first to show clear experimental evidence of the phenomenon.

Peter Wadhams, professor of ocean physics at Cambridge University, hitched rides under the Arctic ice cap in Royal Navy submarines and used ships to take measurements across the Greenland Sea. “Until recently we would find giant ‘chimneys’ in the sea where columns of cold, dense water were sinking from the surface to the seabed 3,000 metres below, but now they have almost disappeared,” he said. “As the water sank it was replaced by warm water flowing in from the south, which kept the circulation going. If that

mechanism is slowing, it will mean less heat reaching Europe.”

Such a change could have a severe impact on Britain, which lies on the same latitude as Siberia and therefore ought to be much colder. The Gulf Stream transports 27,000 times more heat to British shores than all the nation’s power supplies could provide, warming Britain by 5 to 8 degrees centigrade.

Wadhams and his colleagues believe, however, that such changes could be already under way. They predict that the slowing of the Gulf Stream is likely to be accompanied by other effects, such as the complete summer melting of the Arctic ice cap by as early as 2020 and almost certainly by 2080. This would spell disaster for Arctic wildlife such as the polar bear, which could face extinction. They support their claims with measurements taken under the North Polar ice cap showing that the ice has become 46% thinner over the past 20 years.

However, the exact effect of such changes is hard to predict because currents and weather systems take years to respond. One possibility is that Europe will freeze: another is that the slowing of the Gulf Stream may keep Europe cool as global warming heats the rest of the world – but with more extremes of weather.

Source: Adapted from The Sunday Times, 8 May 2005.

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Understanding and Responding to Climate Change

A report by the National Academies

Climate change and greenhouse gases.

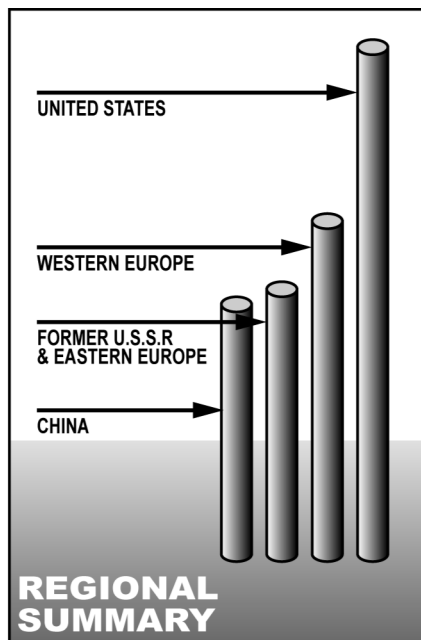
A growing body of evidence indicates that the Earth's atmosphere is warming. Records show that surface temperatures have risen about 0.7°C since the early twentieth century and that most of this increase has occurred since 1978. Observed changes in oceans, ecosystems, and ice cover are in line with this warming trend. The fact is that Earth's climate is always changing. A key question is how much of the observed warming is due to human activities and how much is due to natural variability in the climate? In the judgement of most climate scientists, Earth's warming in recent decades has been caused primarily by human activities that have increased the amount of greenhouse gases in the atmosphere.

Greenhouse gases are at their highest levels for at least 400,000 years and continue to rise. Global warming could bring good news for some parts of the world, such as longer growing seasons and milder winters. Unfortunately, it could bring bad news for a much higher percentage of the world's people. Those in coastal communities, many in developing nations, are likely to experience increased flooding due to sea-level rise and more severe storms and surges.

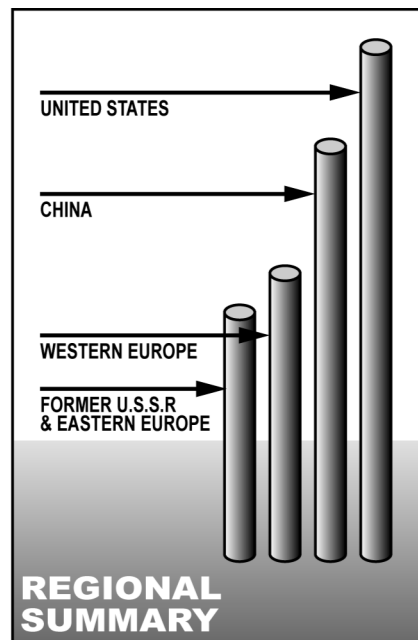
Steps can be taken to reduce greenhouse gases in the atmosphere. Despite some unanswered questions remaining, the scientific understanding of climate change is now sufficiently clear to justify taking steps to reduce the amount of greenhouse gases in the atmosphere. Because carbon dioxide and other greenhouse gases can remain in the atmosphere for many decades, centuries, or longer, the climate change impacts from concentrations today are likely to continue well beyond the 21st century and could potentially accelerate. Failure to implement significant reductions in net greenhouse gas emissions will make the job much harder in the future.

Energy is essential for all sectors of the economy including industry, commerce, homes, and transportation. Worldwide energy use continues to grow with economic and population expansion. Developing countries, China and India in particular, are rapidly increasing their use of energy, primarily from fossil fuels, and consequently their emissions of CO₂ (carbon dioxide).

Comparisons of Carbon Dioxide (CO₂) emissions per nation in 2000 and projections for 2025



2000



2025

Carbon emissions from energy can be reduced by using it more efficiently or by switching to alternative fuels. Electricity can be produced without significant carbon emissions using nuclear power and renewable energy technologies, such as solar, wind, and biofuels. Replacing coal-fired electric power plants with more efficient, modern natural-gas-fired turbines would reduce carbon emissions.

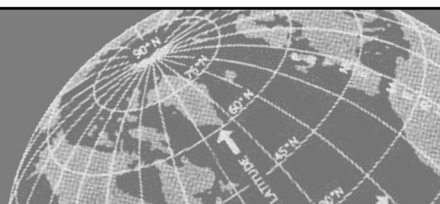
Governments have proved they can work together successfully to reduce or reverse negative human impacts on nature. A classic example is the successful international effort to phase out the use of chlorofluorocarbons (CFCs) in aerosol sprays and refrigerants that were destroying the Earth's protective ozone layer. Personal, national, and international choices could also have an impact; for example driving less, regulating aviation emissions and sharing energy technologies could all be beneficial.

Fuel economy could be improved by manufacturing more electric or hybrid vehicles and there are benefits in increasing the energy efficiency of lighting, refrigerators and other appliances. Many of these improvements are cost-effective means to significantly reduce energy use but are being held back by market constraints such as consumer awareness, high initial costs and the lack of industry incentives and effective policy.

It is not enough to talk about global warming – all of us (nations, governments, businesses and individuals) must start acting now.

Source: Adapted from National Academies website, June 2006.

BBC



Climate change: The big emitters

The future of the Kyoto Protocol – an international agreement to reduce carbon dioxide (CO₂) emissions – is largely in the hands of the world's biggest contributors to greenhouse gas. BBC News Online looks at how much they emit and what they are doing about it, and then considers what part individual consumers can play in helping to reduce emissions.

United States

The US emits more carbon dioxide than any other country. When the Kyoto Protocol was agreed, the US signed and committed to reducing its emissions by 6%. But since then it has pulled out of the agreement and its carbon dioxide emissions have increased to more than 15% above 1990 levels.

European Union

All 15 European Union states ratified the Kyoto deal in May 2002. However, it is some way off its own target. It pledged to bring total greenhouse gas emissions to 8% below 1990s levels by 2008-2012, but by 2002 they had dropped only 2.9% – and CO₂ emissions had risen slightly. Only four EU countries are on track to achieve their own targets.

China

China is the world's second biggest emitter of greenhouse gases. With China accounting for a fifth of the world's population, increases in its emissions could dwarf any cuts made by the industrialised countries. With the economy developing at high speed, many analysts expect China's total emissions to overtake the US's by the middle of the century.

Russia

Russia ratified the Kyoto Protocol in November 2004. Russia's economy has shrunk so drastically since 1990 that its emissions are well below the level allowed under Kyoto.

Japan

Japan was responsible for 8.5% of emissions in 1990. It committed to reduce emissions by 6% from 1990 levels but 2002 figures showed total greenhouse gas emissions had risen 11% above the baseline figure.

India

India's emissions are currently low but, as they raise living standards, their emissions will increase. India's emissions are estimated to have risen by more than 50% in the 1990s. With India's economy and population, like China's, continuing to grow, it is clear that the thorny issue of developing country emissions commitments will have to be tackled soon in future rounds of negotiations.

The role of individual consumers

Action by national governments and industries is critical to the future of the Kyoto Protocol but we, as individuals, can also make a difference.

Most energy used in the house comes from power stations that burn fossil fuels, so reducing our own energy consumption will lead to a reduction in the total amount of CO₂ released from these power stations.

We can reduce our own power consumption by choosing energy-efficient appliances and light bulbs, switching off all lights and electrical appliances when not in use (the TV left on standby can still use a quarter of full power), turning down thermostats (just 1°C lower can save up to 10 per cent on your heating bill) and keeping lids on pans when cooking. We should also ensure that we all have at least 15cm of loft insulation, use draught excluders and put foil behind radiators on outside walls to reflect the heat back inside.

Emissions from transport are also a problem and one of the fastest growing contributors to climate change. Choosing to walk, cycle or use public transport rather than a car is good for the environment and healthier for you! If you must use a car, share whenever possible, especially for daily journeys such as going to work and school runs, and drive smoothly and in the highest gear possible to reduce exhaust emissions. When buying a new car, make fuel efficiency your first consideration. Finally, don't travel by air if you can avoid it – air travel uses up large amounts of fossil fuels and creates greenhouse gases.

Source: Based on BBC News Online, Monday 4 July 2005.

Go on, take off your green-tinted glasses and see the real world

By Mick Hume

In my youth, to be labelled green would mean that you were deemed gullible, ignorant, immature, inexpert, naive, starry-eyed, unworldly and wet behind the ears.

Today many wear the green label with pride, as a sign of grown-up wisdom. But I think the old meanings still apply. There remains a hole in the Doh!-zone layer between starry-eyed, unworldly policies of officials in green-tinted glasses and the way that most people live in the multicoloured real world.

For instance, this week the first person to be prosecuted for failing to recycle her household rubbish was cleared. Magistrates in Exeter ruled that there was insufficient evidence that Donna Challice, a mother of three, had put rotting food in the green recycling bin intended for cans, paper, plastic and glass. The council complained that they should not have to find “direct evidence of an individual contaminating a recycling bin”, and demanded that the law be changed to make it easier to hand out £1,000 fines for unproven offences, no doubt on recycled paper.

This little case puts the bin-lid on the mixture of the absurd and the authoritarian in many green policies. Domestic recycling is a load of rubbish, a messy waste of our most precious resource – time. It is far too small-scale to make any real difference to big issues such as waste disposal and global warming. The only result of these compulsory-recycling policies is to sort people into two imaginary piles – the pious and the polluters.

Look at the Government’s Energy Review. All attention has been focused on the

inclusion of the nuclear option. Yet what seems truly outrageous is the idea that so-called renewables, such as wind power and burning biofuels, could provide enough green energy to meet a fifth of the UK’s rising needs. That would surely not be realistic even if all of Britain’s hills and coastlines were covered with giant wind turbines, and the fields of this green and pleasant land were filled with garish yellow rape that makes it look as if some superhuman graffiti artist has run riot with a spray can.

Then, last week, Members of the European Parliament voted overwhelmingly to impose new taxes on airlines – to punish them for carbon pollution and to curb the growth of cheap flights. Never mind that millions are now voting with their feet and expanding their horizons by flying around Europe and the world. Never mind that, as the airlines point out, the Euro measures are purely discriminatory and fly in the face of any realistic strategy.

Only the gullible could believe that such eco-illogical ideas are a step forwards. Domestic recycling laws bring back drudgery that should have been abolished with the invention of the municipal dustbin. Renewable energy means reversing history by spreading out energy production across the country again, instead of concentrating it in efficient power stations and restricting air travel means trying to return the worldly-wise masses to a state of village idiocy.

To see this garbage passed off as the progressive alternative is enough to make some of us feel green with nausea.

Source: Adapted from The Times, 14 July 2006.

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